U.S. EPA RCRA CORRECTIVE ACTION
CORRECTIVE MEASURES PROPOSAL

U.S. EPA Docket No. RCRA-05-2007-0011
(Administrative Order on Consent)

BWAY CORPORATION
METAL CONTAINER
MANUFACTURING FACILITY
Cincinnati, Ohio

EPA ID No. OHD004253225

Project No. 214114.0000.0000/003

December 18, 2016

Prepared For

BWAY CORPORATION
8200 Broadwell Road
Cincinnati, Ohio

Prepared By

TRC Environmental Corporation

And

Ramboll Environ US Corporation

2004053

TABLE OF CONTENTS

EXECUTIVE SUMMARY **1**

1.0 INTRODUCTION **1**
1.1 General 2
1.2 Report Organization 2

2.0 FACILITY BACKGROUND **1**
2.1 Site and Area Description 1
2.1.1 Facility and Area Land Use 1
2.1.2 Site Ownership History 2
2.1.3 Facility Conditions 2
2.2 Hydrogeological Setting 3
2.3 Water Supply and Groundwater Use 4
2.4 Summary of Facility Investigations 5
2.4.1 RFI Summary 5
2.4.2 Contaminants of Interest 5
2.4.3 Media of Interest 6

3.0 SUMMARY OF SITE RISKS AND CORRECTIVE MEASURES ASSESSMENT **1**
3.1 Human Health 1
3.2 Ecological 3

4.0 SUMMARY OF CORRECTIVE MEASURES PROPOSAL **1**
4.1 Summary of Potentially Significant Exposures 1
4.2 Corrective Measures Objectives 1
4.3 Proposed Corrective Measure 2
4.3.1 Performance Standards and Monitoring 2

5.0 PUBLIC PARTICIPATION AND IMPLEMENTATION **3**
5.1 Mechanisms for Public Participation 3
5.2 Corrective Measures Implementation Order 3

6.0 REFERENCES **1**

List of Tables

1: Conceptual Site Model for Potential Human Exposures
2: Corrective Measures Objectives

List of Figures

1: Site Vicinity Map
2: Location of SWMUs, AOCs and AOIs
3: Corrective Action RFI Sampling Locations
4: Geologic Cross-Section A to B
5: Quarterly Ground Water Sample Results Since 2007

List of Appendices

I: Sampling and Analysis Plans
II: CA725 Environmental Indicator Supporting Documentation
III: CA750 Environmental Indicator Supporting Documentation
IV: Ecological Risk Assessment Report
V: Entire Report on CD-Rom
- Includes Quarterly Reports with Lab and Field Data from the RFI

EXECUTIVE SUMMARY

As required by the Administrative Order on Consent (Streamlined Order) for the Bway metal container manufacturing facility (Facility) located at 8200 Broadwell Road, Cincinnati, Ohio, Bway Corporation (Bway) has investigated potential releases of hazardous waste and hazardous constituents at and adjacent to the Facility. As part of the requirements of the Streamline Order, following submittal of Environmental Indicator (EI) reports, Bway is required to submit a Final Corrective Measures Proposal (CMP) to U.S. EPA. Final approval of the CA725 EI and CA750 EI was provided by the U.S. EPA on September 23, 2016 and September 16, 2016, respectively.

As specified in the Streamlined Order, Bway is providing this CMP to address any significant releases of hazardous waste and/or hazardous constituents from or at the Facility. In support of this corrective measures planning, Bway conducted a RCRA Facility Investigation (RFI) which supported the preparation of the EI Reports. In addition, Bway prepared an Ecological Risk Assessment (ERA) using RFI site characterization data to supplement the human health risk-based data assessments presented in the approved EI submittals; the ERA was approved by U.S. EPA on October 4, 2016. The ERA report and supporting documentation from the approved EI reports are included with this CMP submittal, along with supporting documentation from the Corrective Action RFI.

As documented in RFI progress reports, EI reports and the ERA, no significant Facility-related releases of hazardous waste and/or hazardous constituents were identified during the RFI. However, hazardous constituents have been detected in groundwater on the Facility from an upgradient off-site source. The presence of these constituents on the Facility is addressed by this CMP. Because the presence of COCs in groundwater is not Facility-related, Bway is proposing a corrective measure that relies on institutional controls to reduce potential exposures to groundwater at the Facility. Specifically, Bway will implement a deed restriction to prevent the use of on-Facility groundwater. Bway will also restrict future land use to commercial/industrial activities.

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<u>Section</u>	<u>Topic</u>
1.0	Introduces the site, brief background, and purpose of the document.
2.0	Summarizes the Facility background including a summary of the RFI activities, descriptions of the local and reasonably anticipated future land use, former and current Facility operations, an overview of the site conceptual model and hydrogeological setting, water use and contaminants of interest.
3.0	Summarizes the results of the human health and ecological risk assessments.
4.0	Provides an overview of the corrective measures proposal including corrective measures objectives, performance standards, and the proposed corrective measures to address objectives and standards.
5.0	Discusses public participation in the corrective measures process.
6.0	Provides references.

2.0 FACILITY BACKGROUND

2.1 Site and Area Description

2.1.1 Facility and Area Land Use

The Facility is located at 8200 Broadwell Road in the Township of Anderson, Ohio at 39^{o} 08'21" North latitude and 84^{o} 19'15" West longitude. Anderson Township is located in the east-central portion of Hamilton County, which is located in the southwestern portion of Ohio (Figure 1). The bordering Clermont County is located approximately one mile east of the Facility. The Little Miami River flows to the southwest and is approximately 0.25 miles from the northwest corner of the property. The nearest major city is the City of Cincinnati, which is located approximately five miles to the west of the Facility.

The property is comprised of two parcels totalling 77 acres and is bound by Broadwell Road to the south (there is a closed construction demolition debris landfill located across Broadwell Road); a Norfolk and Western railroad to the east boarded by the SENCO metal fastener industrial facility; and closed quarry ponds to the north and west owned by Martin Marietta.

The Facility main manufacturing building is comprised of various building additions that have been constructed over time since the 1950's. As shown on Figure 2, the primary features at the Facility include:

- the main manufacturing building and warehouse with connected offices;
- a treated sanitary wastewater storage pond;
- a sanitary biological treatment plant and a former land-application sprayfield located in the northeast corner of the Facility;
- three gravel pit ponds at the eastern end of the property;
- a small cemetery located within a large grass field along the southern portion of the property bordering Broadwell Road;
- various asphalt driveways and parking lots; and
- three railroad spurs tying into the Norfolk and Western railroad line at the northern end of the Facility.

Based on the 2005 Anderson Township Comprehensive Plan, the Facility property and surrounding area is expected to remain zoned for industrial use in the future. In addition, it is possible for new construction to be performed at the Facility, in which case, construction workers involved with new building

construction could be exposed to Facility soils and subsurface water. If such work were to occur, it is expected that workers will be required to be covered by a site-specific Health and Safety Plan. There are, however, no current plans for construction of new buildings at the Facility.

2.1.2 Site Ownership History

The property on which the Facility is located was farmland until Baldwin Piano purchased the land and built a single manufacturing building in 1952[1]. Baldwin Piano manufactured pianos on the Facility until 1958 when it was sold to Heekin Can. Heekin Can cut, coated, printed, and assembled three piece cans on the property, and during the 1960s, constructed several additions to the original building. Starting in 1973, Heekin Can added two-piece can manufacturing operations using a drawn and iron process (D&I). This process was subsequently discontinued in 1989, but Heekin Can continued to operate its three piece can manufacturing process on the property until it was acquired by Ball in March 1993. Ball sold the property to Milton Can, a division of Bway, in 1996. Bway continues to manufacture three-piece steel cans at the Facility.

2.1.3 Facility Conditions

The Current Conditions Report (Payne, 2007) describes the current conditions at all SWMUs and AOCs identified in the PA/VSI (A.T. Kearney, 1989), and discusses any other past or present locations at the Facility for which Bway has information relating to past treatment, storage, or disposal of hazardous waste or hazardous constituents. In addition to the SWMUs and AOC identified during the PA/VSIs, Bway identified additional areas as Areas of Interest (AOI)s. The CCR also incorporates a summary and analysis of existing data available with regard to previous investigations and remedial actions at the Facility to identify areas on and off the property where additional investigations were recommended. A detailed summary of the history of the operations and waste activities at the Facility was presented in the PA/VSI report, and updated in the CCR (Payne Firm, 2007). For the purposes of this CMP, a general summary of the information in these reports requiring further investigation during the RFI is provided below.

- Historical operations at the Facility have influenced key areas on the property with regard to waste management practices.
- An area on the property (east of the present manufacturing plant) was excavated as a gravel pit as early as 1938 and was later used as a disposal area for various waste streams from the Facility and the

[1] The PR/VSI indicates that the site was used to manufacture munitions and bomb fuses prior to 1952. Subsequent investigations by ENVIRON in 1996, EMG in 1999, and the Payne Firm in 2007 have reviewed historical documents dating from 1900 and have concluded that these reports are unsubstantiated.

3.0 SUMMARY OF SITE RISKS AND CORRECTIVE MEASURES ASSESSMENT

The primary objective of the Corrective Action RFI was to characterize the nature and extent of any releases of hazardous wastes or hazardous constituents at or from the Facility, and to assess the potential significance of hypothetical risks associated with potential current and reasonably likely future human and ecological exposures to identified releases of Facility-related hazardous wastes or hazardous constituents. An evaluation of hypothetical human health risks under current conditions was provided in the *Resource Conservation and Recovery Act CA725 Environmental Indicators* Supporting *Documentation* (CA725 EI; 2016), which is included as Appendix II and summarized in Section 3.1 below. An evaluation of groundwater was provided in the *Resource Conservation and Recovery Act CA750 Environmental Indicators* Supporting *Documentation* (CA750 EI; 2016), which is included as Appendix III and summarized in Section 3.1 below. The ERA conducted as part of the RFI is provided as Appendix IV; a summary of the approved ERA is provided in Section 3.2 below.

3.1 Human Health

CA725 – Human Exposures Under Control

The human health risk assessment used site characterization data collected during the RFI field investigation to evaluate the potential significance of reasonable maximum exposures under current and reasonably expected future land use and groundwater use at and around the Site. As described in Section 2.1.1, on-property land use is currently industrial, and is reasonably expected to remain industrial in the future. Surrounding land use includes both commercial/industrial and some residential land uses. Based on these identified land uses, the potential receptors considered in the human health risk evaluation are summarized on Table 1 and include:

On-Site:

Routine workers
Maintenance workers
Construction workers
Trespassers

Off-Site:

Routine workers
Maintenance workers
Residents
Trespassers

OW-6										
DATE	T/D	AS	CR	FE	PB	MN	TL	PCE	TCE	VC
9/17/2014	T	1.4 J	18	1100	0.91 JB	44	0.12 JB	1.2	< 1 U	< 1 U
9/17/2014	D	0.84 JB	< 2 U	< 50 U	< 1 U	8	< 1 U	N/A	N/A	N/A
12/16/2014	T	1 J	15 Bj	310 Bu	0.27 JBj	13	< 1 U	1.8	0.15 J	< 1 U
12/16/2014	D	0.91 JB	1.3 JB	< 50 Uu	< 1 Uj	6 B	< 1 U	N/A	N/A	N/A
3/9/2015	T	<1.4 JBu	13 B	1000	0.84 JBu	34	< 1 U	1.8	< 1 U	< 1 U
3/9/2015	D	0.69 J	<1.4 JBu	< 50 U	< 1 U	5.1	< 1 U	N/A	N/A	N/A
5/19/2015		2.4 JB	19 B	2100	1.8	64	< 1 U	2	< 1 U	< 1 U
5/19/2015	D	1.2 JB	1.5 JB	< 50 U	0.17 JB	2 J	< 1 U	N/A	N/A	N/A

OW-6D									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	13	35	3500	0.55 JB	240	0.12 JB	< 1 U	< 1 U
9/17/2014	D	7.2 B	30	2200	0.32 J	240	< 1 U	N/A	N/A
12/16/2014	T	9.1	44 B	2900 B	<0.33 JBu	240	< 1 U	< 1 U	< 1 U
12/16/2014	D	5.1 B	1.3 JBj	< 50 U	< 1 U	230 B	< 1 U	N/A	N/A
3/9/2015	T	13 B	45 B	4000	< 1 Bu	300	< 1 U	< 1 U	< 1 U
3/9/2015	D	6.4	<1.2 JBu	< 50 U	< 1 U	250	< 1 U	N/A	N/A
5/19/2015	T	8.1 B	2 B	1900	0.13 J	230	< 1 U	< 1 U	< 1 U
5/19/2015	D	5 B	2.6 B	140 B	0.17 JB	230	< 1 U	N/A	N/A

OW-7									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	0.63 J	2.1	290	0.19 JB	47	0.11 JB	< 1 U	< 1 U
9/17/2014	D	0.57 JB	< 2 U	< 50 U	< 1 U	37	< 1 U	N/A	N/A
12/16/2014	T	1 J	9.1 Bj	320 Bu	0.27 JBj	24	< 1 U	< 1 U	< 1 U
12/16/2014	D	0.85 JBj	2 Bj	< 50 U	< 1 U	11 Bj	< 1 U	N/A	N/A
3/9/2015	T	<2.2 JBu	33 B	2200	1.4 B	120	< 1 U	< 1 U	< 1 U
3/9/2015	D	0.88 J	< 3.2 Bu	< 50 U	< 1 U	6.2	< 1 U	N/A	N/A
5/19/2015	T	2.3 JB	41 B	2100	1.2	96	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.1 JB	1.4 JB	< 50 U	0.16 JB	6.5	< 1 U	N/A	N/A

OW-7D									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	4.8 J	13	6600	0.19 JB	53	0.077 JB	< 1 U	< 1 U
9/17/2014	D	1.9 JB	< 2 U	380	< 1 U	46	< 1 U	N/A	N/A
12/16/2014	T	6.4	50 B	7200 B	0.83 JBj	71	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.2 JBj	1.2 JBj	62 Bu	< 1 U	40 B	< 1 U	N/A	N/A
3/9/2015	T	7.7 B	26 B	7200	<0.33 JBu	57	< 1 U	< 1 U	< 1 U
3/9/2015	D	3.2 J	<1.3 JBu	270	< 1 U	46	< 1 U	N/A	N/A
5/19/2015	T	8.5 B	2.9 B	7200	0.63 J	71	< 1 U	< 1 U	< 1 U
5/19/2015	D	2.9 JB	1.6 JB	< 50 U	0.13 JB	44	< 1 U	N/A	N/A

OW-2									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2.3 J	2.7	1500	2.8 B	72	1.5 B	< 1 U	< 1 U
9/17/2014	D	0.57 JB	< 2 U	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	5.2 Bj	3200 B	5.6 B	160	0.28 J	< 1 U	< 1 U
12/16/2014	D	0.65 JBj	1.2 J Bj	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
3/9/2015	T	4.2 JB	< 6.2 Bu	7100	6.1 B	390	0.088 J	< 1 U	< 1 U
3/9/2015	D	0.76 J	<1.4 JBu	< 50 U	0.26 J	1.3 J	0.3 J	N/A	N/A
5/19/2015	T	1.8 JB	2.6 B	2000 j	1.7	61	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.9 JB	1.6 JB	17 JB	0.42 JB	< 5 U	0.35 JB	N/A	N/A

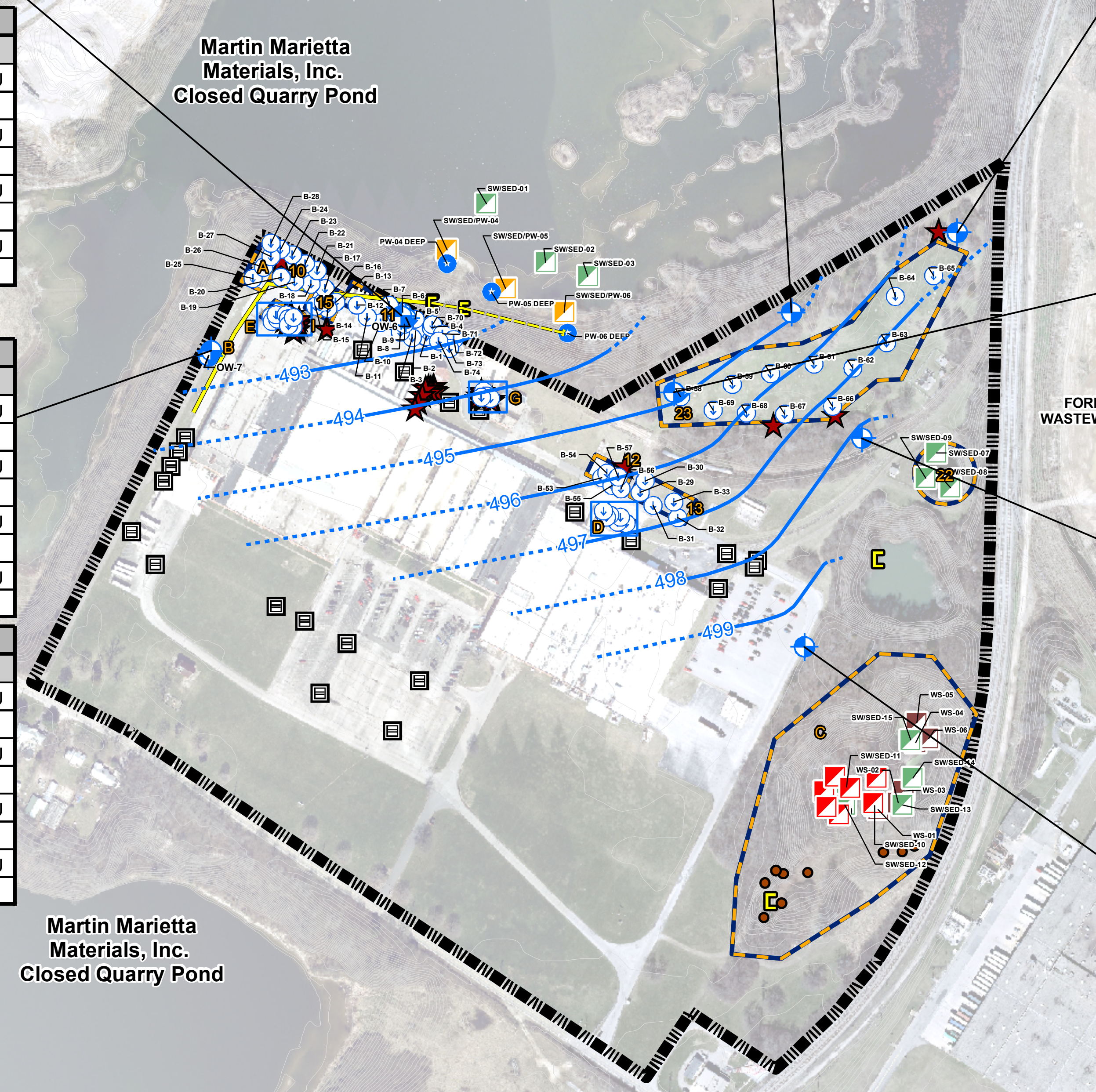
OW-3									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	7.6	7.3	20000	11 B	1200	0.44 JB	29	< 1 U
9/17/2014	D	0.5 JB	< 2 U	< 50 U	< 1 U	320	< 1 U	N/A	N/A
12/16/2014	T	4.7 J	6.1 Bj	12000 B	6 B j	1400	0.12 J	11	< 1 U
12/16/2014	D	0.61 JBj	1.1 JBj	< 50 U	< 1 U	510 B	< 1 U	N/A	N/A
3/9/2015	T	4.5 JB	< 5.6 Bu	12000	6.5 B	890	0.096 J	11	< 1 U
3/9/2015	D	0.62 J	<1.3 JBu	< 50 U	0.13 J	550	0.11 J	N/A	N/A
5/19/2015	T	3.3 JB	4.7 B	8400	4.6	820	< 1 U	20	< 1 U
5/19/2015	D	1.1 JB	1.4 JB	< 50 U	0.25 JB	220	0.15 JB	N/A	N/A

OW-4									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2 J	2.7	630	0.47 JB	64	0.29 JB	< 1 U	< 1 U
9/17/2014	D	1.5 JB	< 2 U	< 50 U	< 1 U	21	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	61 B	1200 B	0.9 JBj	98	0.085 J	< 1 U	< 1 U
12/16/2014	D	1.6 JBj	1.1 JBj	< 50 U	< 1 U	10 B j	< 1 U	N/A	N/A
3/9/2015	T	<1.8 JBu	< 2.7 Bu	160	< 0.19 JBu	15	< 1 U	< 1 U	< 1 U
3/9/2015	D	1.6 J	<1.2 JBu	< 50 U	< 1 U	3.3 J	0.092 J	N/A	N/A
5/19/2015	T	3.9 JB	110 B	3800	2.3	320	0.09 J	< 1 U	< 1 U
5/19/2015	D	1.5 JB	1.5 JB	< 50 U	0.21 JB	31	0.13 JB	N/A	N/A

SENCO PRODUCTS INC.
FORMER DISCHARGE POND FOR SANITARY WASTE WATER AND UNTREATED INDUSTRIAL PROCESS WASTEWATER INCLUDING OILS, METALS AND SPENT HALOGENATED AND NON-HALOGENATED SOLVENTS USED IN DEGREASING (F001, 002, 003, 005).
(Source: Ohio EPA Files; EDR Database Radius Report)

OW-1									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2.7 J	16	260	0.73 JB	9.2	0.99 JB	< 1 U	< 1 U
9/17/2014	D	2.1 JB	0.4 J	< 50 U	0.12 J	3.6 J	0.11 J	N/A	N/A
12/16/2014	T	2.4 J	1.5 JBj	180 Bu	0.29 JBj	8.1	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.3 J	1.4 JBj	< 50 U	0.17 J	< 5 U	0.23 J	N/A	N/A
3/9/2015	T	2.6 JB	< 2.2 Bu	240	<0.44 JBu	10	0.19 J	< 1 U	< 1 U
3/9/2015	D	2.2 J	<1.4 JBu	< 50 U	0.16 J	< 5 U	0.21 J	N/A	N/A
5/19/2015	T	2.6 JB	9.4 B	170	0.28 J	10	0.091 J	< 1 U	< 1 U
5/19/2015	D	3.1 JB	1.6 JB	22 JB	0.34 JB	< 5 U	0.23 JB	N/A	N/A

OW-5									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	3.2 J	35	3000	1.8 B	270	0.26 JB	< 1 U	0.43 J
9/17/2014	D	1.3 JB	< 2 U	< 50 U	< 1 U	220	< 1 U	N/A	N/A
12/16/2014	T	1.5 J	2.5 B	550 B	0.33 JB	33	0.087 J	< 1 U	< 1 U
12/16/2014	D	0.94 JBj	1.1 JBj	< 50 U	< 1 U	15 Bj	< 1 U	N/A	N/A
3/9/2015	T	9.2 B	22 B	9900	4.9 B	370	0.2 J	< 1 U	< 1 U
3/9/2015	D	1 J	<1.2 JBu	< 50 U	< 1 U	20	< 1 U	N/A	N/A
5/19/2015	T	1.9 JB	3 B	940	0.6 J	23	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.4 JB	1.4 JB	< 50 U	0.22 JB	1.2 J	0.14 JB	N/A	N/A



LEGEND

- Groundwater Observation Well
- Groundwater Contours (5/19/2015)
- Groundwater Contours (extrapolated)
- BWAY Property Boundary
- 2 FT Ground Surface Contours
- SWMU, AOC, or AOI investigated area

RFI Sampling Locations

- Geoprobe Soil Sample Location
- Pore Water Sample Location
- Collocated Surface Water and Sediment Sample Location
- Collocated Surface Water, Sediment, and Pore Water Sample Location
- Shallow Wetland Soil Sample Location

N

0 200 400 Feet

legal shown

Notes
All samples reported in UG/L (micrograms per liter); QA/QC Duplicate samples not shown on figure.
AS = Arsenic; CR = Chromium; FE = Iron; PB = Lead; MN = Manganese; TL = Thallium; TCE = Trichloroethene; VC = Vinyl Chloride; PCE = Tetrachlorethene
RSL: USEPA Regional Screening Levels, November 2015 (Iron RSL = 15,000) (Manganese RSL = 480)
MCL: Maximum Contaminant Level enforceable standard of National Primary Drinking Water Regulations under Safe Drinking Water Act
(Arsenic MCL = **10**) (Chromium MCL = **100**) (Lead MCL = **15**) (Thallium MCL = **2**) (TCE MCL = **5**) (Vinyl Chloride MCL = **2**)
T/D: measured basis (metals only); T = total, D = dissolved
N/A: Not Analyzed
U: Test America Lab Qualifier. Nondetect.
J: Test America Lab Qualifier. Method blank contamination. The associated method blank contains the target analyte at a reportable level.
B: Test America Lab Qualifier. Estimated result. Result is less than the reporting limit.
j: TRC Qualifier. The analyte was not detected above the reporting sample quantitation limit. However, the reported quantitation limit is approx. and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
u: TRC Qualifier. The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

TITLE
GROUNDWATER SAMPLE LOCATIONS & RESULTS SINCE SEPTEMBER 2014

PROJECT
BWAY RCRA CORRECTIVE ACTION (RCRA-05-2007-0011)

DATE *Tuesday, March 22, 2016*

FIGURE *1*

PROJECT NUMBER *214114*

DRAWN BY *GIS*

TRC
11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255
http://www.trcsolutions.com/

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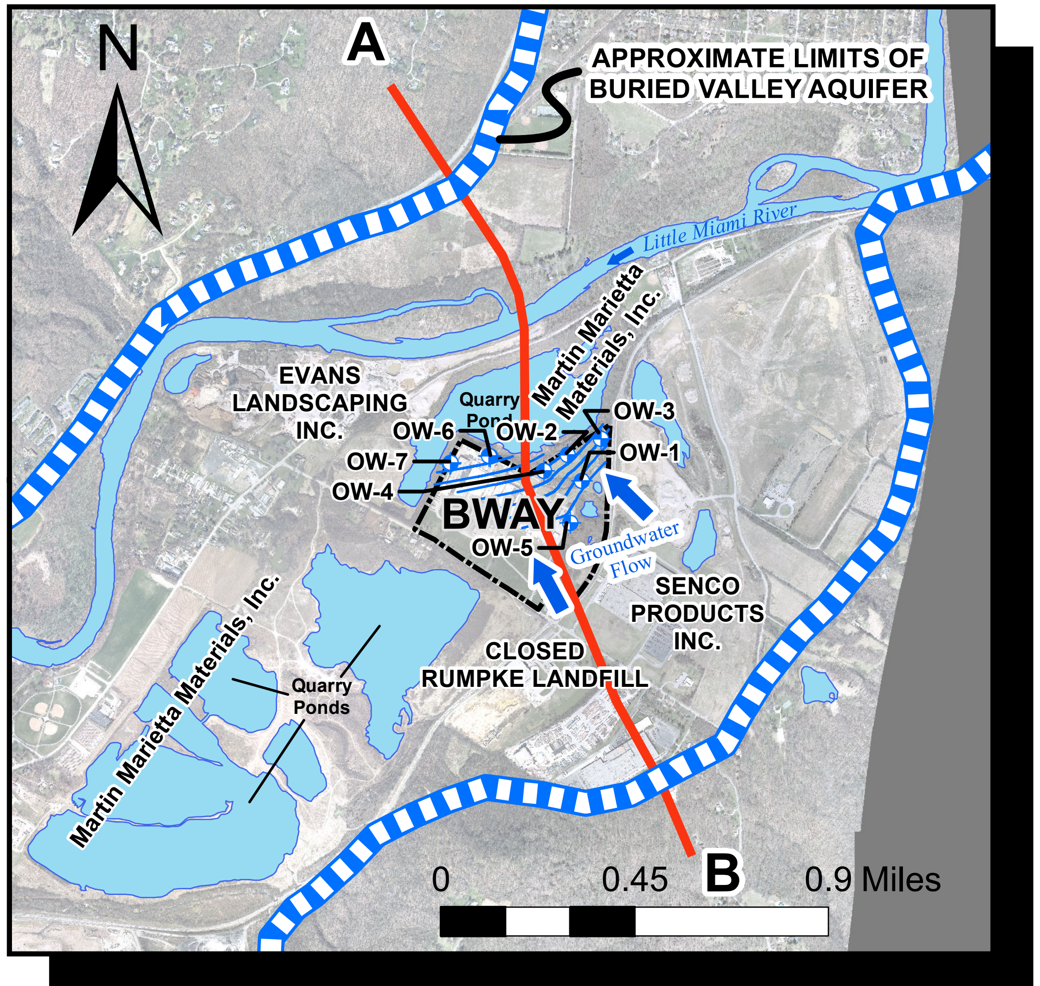
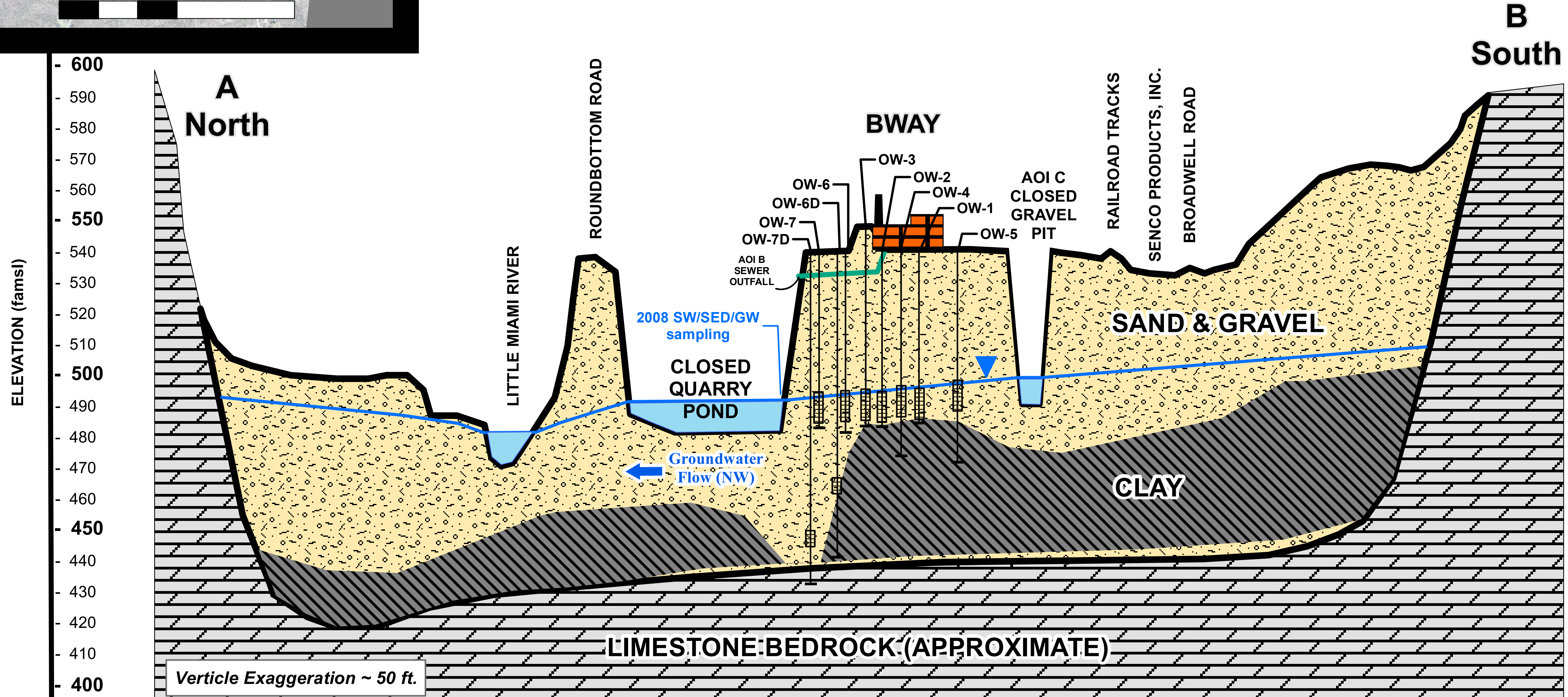


HYDROGEOLOGIC SUMMARY

- The site is underlain by the Little Miami River Buried Valley Aquifer and sits within the Little Miami River Watershed. The Little Miami River flows southwest of the site. Based on maps published by the Ohio EPA, the Facility is not located within a well field protection district.
- The Facility is located over a buried valley which is approximately 100 feet thick and 1 mile wide assigned to a portion of the U.S. EPA designated Greater Miami Sole Source Aquifer system.
- The unconsolidated deposits beneath the facility and in the vicinity of the Property generally consist of about 80 feet of sand and gravel deposits overlying about 30 feet of fine-grained, very-low permeability, glacial tills on top of bedrock.
- The underlying bedrock is composed of interbedded layers of shale and limestone belonging to the Kope Formation of Ordovician Age. The bedrock typically yields less than 5 gallons per minute to drilled wells and is not considered to be a significant aquifer.



modified from 1983 Burgess and Niple Hydrogeologic Investigation Report

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REQUESTED BY KDK
PROJECT NO. 214114.0000
FIGURE NO. 2
DRAWN BY JAG/PMR

PROJECT BWAY - RCRA Corrective Action

TITLE Geologic cross-section A to B (updated 2014)

Appendix B

Supplemental Groundwater Monitoring Results Tables

Table B-1a: Groundwater Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria
on	SWMU 23	VOC	Trichloroethene	79-01-6	T	HC	16	4	1.10E-02	2.90E-02	5.0E-03	SM	**5.8E+00**
on	SWMU 23	SVOC	Acetophenone	98-86-2	T	D	16	1	2.80E-04	2.80E-04	2.0E+00	NC	1.4E-04
on	SWMU 23	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	16	3	1.50E-03	3.40E-03	6.0E-03	SM	5.7E-01
on	SWMU 23	SVOC	Butylbenzylphthalate	85-68-7	T	C	16	2	2.00E-04	2.40E-04	4.1E-01	C	5.9E-04
on	SWMU 23	SVOC	Diethylphthalate	84-66-2	T	D	16	7	2.80E-04	8.80E-04	1.6E+01	NC	5.5E-05
on	SWMU 23	SVOC	Di-n-butylphthalate	84-74-2	T	D	16	1	4.10E-04	4.10E-04	2.0E+00	NC	2.1E-04
on	SWMU 23	SVOC	Di-n-octylphthalate	117-84-0	T		16	1	1.40E-03	1.40E-03	2.0E-01	NC	7.0E-03
on	SWMU 23	SVOC	Phenol	108-95-2	T	ID	16	4	4.90E-04	6.20E-04	6.0E+00	NC	1.0E-04
on	SWMU 23	INORG	Aluminum	7429-90-5	D	ID	16	2	9.10E-03	9.90E-03	2.0E+01	NC	5.0E-04
on	SWMU 23	INORG	Antimony	7440-36-0	D	ID	16	10	1.60E-04	5.50E-04	6.0E-03	SM	9.2E-02
on	SWMU 23	INORG	Arsenic	7440-38-2	D	A	16	16	5.00E-04	3.10E-03	1.0E-02	SM	3.1E-01
on	SWMU 23	INORG	Barium	7440-39-3	D	NC	16	16	4.20E-02	8.30E-02	2.0E+00	SM	4.2E-02
on	SWMU 23	INORG	Beryllium	7440-41-7	D	B1	16	13	6.00E-05	1.90E-03	4.0E-03	SM	4.8E-01
on	SWMU 23	INORG	Cadmium	7440-43-9	D	B1	16	10	6.30E-05	3.80E-04	5.0E-03	SM	7.6E-02
on	SWMU 23	INORG	Chromium (total)	7440-47-3	D		16	10	4.00E-04	1.70E-03	1.0E-01	SM	1.7E-02
on	SWMU 23	INORG	Cobalt	7440-48-4	D	LC	16	15	5.60E-05	9.30E-04	6.0E-03	NC	1.6E-01
on	SWMU 23	INORG	Copper	7440-50-8	D	D	16	7	9.00E-04	1.20E-03	1.3E+00	SM	9.2E-04
on	SWMU 23	INORG	Iron	7439-89-6	D	D	16	2	1.70E-02	2.20E-02	1.4E+01	NC	1.6E-03
on	SWMU 23	INORG	Lead	7439-92-1	D	B2	16	10	1.20E-04	4.20E-04	1.5E-02	SM	2.8E-02
on	SWMU 23	INORG	Manganese	7439-96-5	D	D	16	8	1.30E-03	5.50E-01	4.8E-01	NC	**1.1E+00**
on	SWMU 23	INORG	Nickel	7440-02-0	D	A	16	16	5.60E-04	4.40E-03	4.0E-01	NC	1.1E-02
on	SWMU 23	INORG	Selenium	7782-49-2	D	D	16	14	2.60E-04	1.70E-03	5.0E-02	SM	3.4E-02
on	SWMU 23	INORG	Silver	7440-22-4	D	D	16	2	2.00E-05	2.30E-05	1.0E-01	NC	2.3E-04
on	SWMU 23	INORG	Thallium	7440-28-0	D	ID	16	8	1.10E-04	3.50E-04	2.0E-03	SM	1.8E-01
on	SWMU 23	INORG	Vanadium	7440-62-2	D	ID	16	9	2.60E-04	2.50E-03	1.0E-01	NC	2.5E-02
on	SWMU 23	INORG	Zinc	7440-66-6	D	ID	16	1	7.40E-03	7.40E-03	6.0E+00	NC	1.2E-03
on	Unassigned	VOC	Tetrachloroethene	127-18-4	T	LC	24	4	1.20E-03	2.00E-03	5.0E-03	SM	4.0E-01
on	Unassigned	VOC	Trichloroethene	79-01-6	T	HC	24	1	1.50E-04	1.50E-04	5.0E-03	SM	3.0E-02
on	Unassigned	VOC	Vinyl Chloride	75-01-4	T	A	24	1	4.30E-04	4.30E-04	2.0E-03	SM	2.2E-01
on	Unassigned	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	24	3	2.00E-03	5.50E-03	6.0E-03	SM	9.2E-01
on	Unassigned	SVOC	Butylbenzylphthalate	85-68-7	T	C	24	2	2.20E-04	4.70E-04	4.1E-01	C	1.1E-03
on	Unassigned	SVOC	Diethylphthalate	84-66-2	T	D	24	9	3.10E-04	8.10E-04	1.6E+01	NC	5.1E-05
on	Unassigned	SVOC	Di-n-butylphthalate	84-74-2	T	D	24	2	4.10E-04	4.20E-04	2.0E+00	NC	2.1E-04
on	Unassigned	SVOC	Naphthalene	91-20-3	T	C	24	1	1.50E-04	1.50E-04	4.0E-01	NC	3.8E-04
on	Unassigned	SVOC	Phenol	108-95-2	T	ID	24	6	3.50E-04	6.80E-04	6.0E+00	NC	1.1E-04
on	Unassigned	INORG	Aluminum	7429-90-5	D	ID	24	2	9.20E-03	2.40E-01	2.0E+01	NC	1.2E-02
on	Unassigned	INORG	Antimony	7440-36-0	D	ID	24	11	1.70E-04	4.70E-04	6.0E-03	SM	7.8E-02
on	Unassigned	INORG	Arsenic	7440-38-2	D	A	24	24	5.70E-04	7.20E-03	1.0E-02	SM	7.2E-01
on	Unassigned	INORG	Barium	7440-39-3	D	NC	24	24	2.00E-02	4.30E-01	2.0E+00	SM	2.2E-01
on	Unassigned	INORG	Beryllium	7440-41-7	D	B1	24	15	5.40E-05	9.40E-04	4.0E-03	SM	2.4E-01
on	Unassigned	INORG	Cadmium	7440-43-9	D	B1	24	8	7.50E-05	2.30E-04	5.0E-03	SM	4.6E-02
on	Unassigned	INORG	Chromium (total)	7440-47-3	D		24	13	1.10E-03	3.00E-02	1.0E-01	SM	3.0E-01
on	Unassigned	INORG	Cobalt	7440-48-4	D	LC	24	21	1.80E-04	9.30E-04	6.0E-03	NC	1.6E-01
on	Unassigned	INORG	Copper	7440-50-8	D	D	24	4	8.80E-04	1.40E-03	1.3E+00	SM	1.1E-03
on	Unassigned	INORG	Iron	7439-89-6	D	D	24	4	1.40E-01	2.20E+00	1.4E+01	NC	1.6E-01
on	Unassigned	INORG	Lead	7439-92-1	D	B2	24	7	1.30E-04	3.20E-04	1.5E-02	SM	2.1E-02
on	Unassigned	INORG	Manganese	7439-96-5	D	D	24	24	1.20E-03	2.50E-01	4.8E-01	NC	5.2E-01
on	Unassigned	INORG	Mercury	7439-97-6	D	D	24	1	9.20E-05	9.20E-05	2.0E-03	SM	4.6E-02
on	Unassigned	INORG	Nickel	7440-02-0	D	A	24	23	2.90E-04	1.50E-02	4.0E-01	NC	3.8E-02
on	Unassigned	INORG	Selenium	7782-49-2	D	D	24	15	2.90E-04	7.00E-04	5.0E-02	SM	1.4E-02
on	Unassigned	INORG	Thallium	7440-28-0	D	ID	24	3	9.20E-05	1.40E-04	2.0E-03	SM	7.0E-02
on	Unassigned	INORG	Vanadium	7440-62-2	D	ID	24	11	2.90E-04	2.50E-03	1.0E-01	NC	2.5E-02
on	Unassigned	INORG	Zinc	7440-66-6	D	ID	24	1	9.80E-03	9.80E-03	6.0E+00	NC	1.6E-03

Notes:

Only constituents detected in each area are shown.

The drinking water criteria are based on the following hierarchy: State Maximum Contaminant Level (MCL), Federal MCL, USEPA Regional Screening Level (RSL) Tap Water Ingestion value (November 2015) at the lower of the criteria calculated at either the target cancer risk of 1E-5 or target hazard quotient of 1.

The criteria for Chromium (total) are the criteria provided by the agency for Chromium VI.

Ratios of concentration to the criteria greater than 1 are shaded in bold.

SM - The criterion is the State MCL.

C - The criterion is based on cancer risk at a target cancer risk of 1E-5.

NC - The criterion is based on noncancer effects at a hazard quotient of 1.

Chem Group - chemical group

Meas Basis - measured basis; T = total, D = dissolved

Carc Class - USEPA Weight-of-Evidence Cancer Classification

Table B-1b: Groundwater Samples Exceeding Screening Criteria
Bway Corporation, Cincinnati, Ohio

On/Off Site	Area	Location	Sample ID	Sample Type	Sample Date	Chem Group	Chemical	CASRN	Meas Basis	Conc (mg/L)	Qual	Drinking Water Criteria (mg/L)	Ratio of Conc to Drinking Water Criteria
on	SWMU 23	OW-3	OW-3/091714	N	09/17/14	VOC	Trichloroethene	79-01-6	T	2.90E-02		5.0E-03	**5.8E+00**
on	SWMU 23	OW-3	OW-3/121614	N	12/16/14	VOC	Trichloroethene	79-01-6	T	1.10E-02		5.0E-03	**2.2E+00**
on	SWMU 23	OW-3	OW-3/121614	N	12/16/14	INORG	Manganese	7439-96-5	D	5.10E-01	B	4.8E-01	**1.1E+00**
on	SWMU 23	OW-3	OW-3/030915	N	03/09/15	VOC	Trichloroethene	79-01-6	T	1.10E-02		5.0E-03	**2.2E+00**
on	SWMU 23	OW-3	OW-3/030915	N	03/09/15	INORG	Manganese	7439-96-5	D	5.50E-01		4.8E-01	**1.1E+00**
on	SWMU 23	OW-3	OW-3/051915	N	05/19/15	VOC	Trichloroethene	79-01-6	T	2.00E-02		5.0E-03	**4.0E+00**

Notes:

B = Estimated result. The result is less than the reporting limit.

1.0 INTRODUCTION

TRC Environmental Corporation (TRC) and Ramboll Environ US Corporation (Ramboll Environ) have prepared this Resource Conservation and Recovery Act (RCRA) Corrective Measures Proposal (CMP) on behalf of Bway Corporation (Bway). This CMP report was prepared to fulfill requirements agreed to under Paragraph VI 15 of the U.S. EPA Administrative Order on Consent (Streamlined Order) for the Bway metal container manufacturing facility (Facility) located at 8200 Broadwell Road, Cincinnati, Ohio (see Figure 1). The Streamlined Order, effective September 13, 2007, is an order in which Bway agrees to take corrective remedial measures necessary to protect human health and the environment from unacceptable risks due to releases of hazardous waste or hazardous constituents at or from the Facility. The term "Facility" refers to the Bway manufacturing facility operations located at the 8200 Broadwell Road property. The area referred to as "Site" includes both on- and off-property areas investigated during the RCRA Facility Investigation (RFI).

The overall objective of the Streamlined Order is for Bway to investigate, and as necessary, stabilize and remediate releases of hazardous waste or hazardous constituents originating from the Facility. To date, Bway has completed several activities to identify the nature and extent of hazardous waste and/or hazardous constituents releases at and from the Facility. The RFI activities have consisted of the following:

- Bway has determined whether a release of hazardous constituents to environmental media has occurred at AOIs, AOCs or SWMUs and determined Site-wide hydrogeologic conditions, as necessary, to investigate potential releases from AOIs, AOCs and SWMUs.
- Bway characterized the nature and extent of releases of hazardous constituents in or from the Facility and characterized actual and potential migration pathways, actual and potential human and environmental receptors, and current and reasonably expected future land and groundwater uses.
- Bway has assessed potential risk to human health and the environment associated with releases of hazardous constituents from the Facility on- and off-property;
- Bway has provided U.S. EPA sufficient data to support a demonstration that current human exposures to contamination above risk-based screening levels are under control (EI CA725), and that the migration of groundwater contaminated above appropriate screening levels is under control (EI CA750).
- As a result of the evaluations performed during the RFI activities, Bway has determined:
    - whether interim measures are necessary to control current unacceptable risks, if any, to human health or the environment, or to control migration of contaminated groundwater (if present); and

- whether a corrective measures evaluation is necessary to mitigate current and future unacceptable risks, if any, to human health and the environment.

1.1 General

Bway is the current owner/operator of the metal container manufacturing facility in Cincinnati. A previous owner/operator, Ball Corporation (Ball) is working with Bway to fulfil the requirements of the Streamlined Order. Potential constituents of concern were investigated beneath the Facility property and an adjacent closed quarry pond operated by Martin Marietta Materials, Inc. (Martin Marietta).

Results of the RFI were provided in quarterly progress reports submitted for EPA's review between 2007-2016. This CMP document relies upon the results of the RFI and the evaluation of these results presented in the documents listed below, which are referenced throughout this report. These documents present the Facility historical operations, hydrogeology, and the nature and extent determination of chemicals in soil and groundwater beneath the Site. Representative details of the environmental conditions at the Site are documented by boring logs, monitoring wells, figures, cross-sections and analytical data, which were summarized in tables, figures and appendices provided in the following referenced documents.

- March 2016, *RCRA, CA Ecological Risk Assessment Report*, Bway Corporation (ERA)
- March 2016, *RCRA, CA 725 Environmental Indicators Report,* Bway Corporation (CA725)
- March 2016, *RCRA, CA 750 Environmental Indicators Report,* Bway Corporation (CA750)
- November 2007, *Current Conditions Report*, Bway Corporation, (CCR)
- September 2007, Administrative Order on Consent, U.S. EPA Docket No. RCRA-05-2007-0011, Bway Corporation, (Streamlined Order)
- August 1989, *Preliminary Review/Visual Site Inspection Report*, Heekin Can Company (PA/VSI)

As specified in the Streamlined Order, public participation has occurred during the performance of the corrective action. All applicable reports are made available to the general public at the public repository established by Bway at the Cincinnati Public Library, Anderson Branch located at 7450 State Road, Cincinnati, Ohio 45230.

1.2 Report Organization

The CMP has been prepared to provide the information necessary for U.S. EPA to make a final remedy decision and prepare a Statement of Basis for the selected remedy. The CMP is organized as follows.

U.S. EPA RCRA CORRECTIVE ACTION
CORRECTIVE MEASURES PROPOSAL

U.S. EPA Docket No. RCRA-05-2007-0011
(Administrative Order on Consent)

BWAY CORPORATION
METAL CONTAINER
MANUFACTURING FACILITY
Cincinnati, Ohio

EPA ID No. OHD004253225

Project No. 214114.0000.0000/003

December 18, 2016

Prepared For

BWAY CORPORATION
8200 Broadwell Road
Cincinnati, Ohio

Prepared By

TRC Environmental Corporation

And

Ramboll Environ US Corporation

TABLE OF CONTENTS

EXECUTIVE SUMMARY 1

1.0 INTRODUCTION 1
1.1 General 2
1.2 Report Organization 2

2.0 FACILITY BACKGROUND 1
2.1 Site and Area Description 1
2.1.1 Facility and Area Land Use 1
2.1.2 Site Ownership History 2
2.1.3 Facility Conditions 2
2.2 Hydrogeological Setting 3
2.3 Water Supply and Groundwater Use 4
2.4 Summary of Facility Investigations 5
2.4.1 RFI Summary 5
2.4.2 Contaminants of Interest 5
2.4.3 Media of Interest 6

3.0 SUMMARY OF SITE RISKS AND CORRECTIVE MEASURES ASSESSMENT 1
3.1 Human Health 1
3.2 Ecological 3

4.0 SUMMARY OF CORRECTIVE MEASURES PROPOSAL 1
4.1 Summary of Potentially Significant Exposures 1
4.2 Corrective Measures Objectives 1
4.3 Proposed Corrective Measure 2
4.3.1 Performance Standards and Monitoring 2

5.0 PUBLIC PARTICIPATION AND IMPLEMENTATION 3
5.1 Mechanisms for Public Participation 3
5.2 Corrective Measures Implementation Order 3

6.0 REFERENCES 1

List of Tables

1: Conceptual Site Model for Potential Human Exposures
2: Corrective Measures Objectives

List of Figures

1: Site Vicinity Map
2: Location of SWMUs, AOCs and AOIs
3: Corrective Action RFI Sampling Locations
4: Geologic Cross-Section A to B
5: Quarterly Ground Water Sample Results Since 2007

List of Appendices

I: Sampling and Analysis Plans
II: CA725 Environmental Indicator Supporting Documentation
III: CA750 Environmental Indicator Supporting Documentation
IV: Ecological Risk Assessment Report
V: Entire Report on CD-Rom
- Includes Quarterly Reports with Lab and Field Data from the RFI

EXECUTIVE SUMMARY

As required by the Administrative Order on Consent (Streamlined Order) for the Bway metal container manufacturing facility (Facility) located at 8200 Broadwell Road, Cincinnati, Ohio, Bway Corporation (Bway) has investigated potential releases of hazardous waste and hazardous constituents at and adjacent to the Facility. As part of the requirements of the Streamline Order, following submittal of Environmental Indicator (EI) reports, Bway is required to submit a Final Corrective Measures Proposal (CMP) to U.S. EPA. Final approval of the CA725 EI and CA750 EI was provided by the U.S. EPA on September 23, 2016 and September 16, 2016, respectively.

As specified in the Streamlined Order, Bway is providing this CMP to address any significant releases of hazardous waste and/or hazardous constituents from or at the Facility. In support of this corrective measures planning, Bway conducted a RCRA Facility Investigation (RFI) which supported the preparation of the EI Reports. In addition, Bway prepared an Ecological Risk Assessment (ERA) using RFI site characterization data to supplement the human health risk-based data assessments presented in the approved EI submittals; the ERA was approved by U.S. EPA on October 4, 2016. The ERA report and supporting documentation from the approved EI reports are included with this CMP submittal, along with supporting documentation from the Corrective Action RFI.

As documented in RFI progress reports, EI reports and the ERA, no significant Facility-related releases of hazardous waste and/or hazardous constituents were identified during the RFI. However, hazardous constituents have been detected in groundwater on the Facility from an upgradient off-site source. The presence of these constituents on the Facility is addressed by this CMP. Because the presence of COCs in groundwater is not Facility-related, Bway is proposing a corrective measure that relies on institutional controls to reduce potential exposures to groundwater at the Facility. Specifically, Bway will implement a deed restriction to prevent the use of on-Facility groundwater. Bway will also restrict future land use to commercial/industrial activities.

U.S. EPA RCRA CORRECTIVE ACTION
CORRECTIVE MEASURES PROPOSAL

U.S. EPA Docket No. RCRA-05-2007-0011
(Administrative Order on Consent)

BWAY CORPORATION
METAL CONTAINER
MANUFACTURING FACILITY
Cincinnati, Ohio

EPA ID No. OHD004253225

Project No. 214114.0000.0000/003

December 18, 2016

Prepared For

BWAY CORPORATION
8200 Broadwell Road
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Prepared By

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EXECUTIVE SUMMARY 1

1.0 INTRODUCTION 1
1.1 General 2
1.2 Report Organization 2

2.0 FACILITY BACKGROUND 1
2.1 Site and Area Description 1
2.1.1 Facility and Area Land Use 1
2.1.2 Site Ownership History 2
2.1.3 Facility Conditions 2
2.2 Hydrogeological Setting 3
2.3 Water Supply and Groundwater Use 4
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2.4.1 RFI Summary 5
2.4.2 Contaminants of Interest 5
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4.3.1 Performance Standards and Monitoring 2

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5.2 Corrective Measures Implementation Order 3

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<u>Section</u>	<u>Topic</u>
1.0	Introduces the site, brief background, and purpose of the document.
2.0	Summarizes the Facility background including a summary of the RFI activities, descriptions of the local and reasonably anticipated future land use, former and current Facility operations, an overview of the site conceptual model and hydrogeological setting, water use and contaminants of interest.
3.0	Summarizes the results of the human health and ecological risk assessments.
4.0	Provides an overview of the corrective measures proposal including corrective measures objectives, performance standards, and the proposed corrective measures to address objectives and standards.
5.0	Discusses public participation in the corrective measures process.
6.0	Provides references.

2.0 FACILITY BACKGROUND

2.1 Site and Area Description

2.1.1 Facility and Area Land Use

The Facility is located at 8200 Broadwell Road in the Township of Anderson, Ohio at 39^{o} 08'21" North latitude and 84^{o} 19'15" West longitude. Anderson Township is located in the east-central portion of Hamilton County, which is located in the southwestern portion of Ohio (Figure 1). The bordering Clermont County is located approximately one mile east of the Facility. The Little Miami River flows to the southwest and is approximately 0.25 miles from the northwest corner of the property. The nearest major city is the City of Cincinnati, which is located approximately five miles to the west of the Facility.

The property is comprised of two parcels totalling 77 acres and is bound by Broadwell Road to the south (there is a closed construction demolition debris landfill located across Broadwell Road); a Norfolk and Western railroad to the east boarded by the SENCO metal fastener industrial facility; and closed quarry ponds to the north and west owned by Martin Marietta.

The Facility main manufacturing building is comprised of various building additions that have been constructed over time since the 1950's. As shown on Figure 2, the primary features at the Facility include:

- the main manufacturing building and warehouse with connected offices;
- a treated sanitary wastewater storage pond;
- a sanitary biological treatment plant and a former land-application sprayfield located in the northeast corner of the Facility;
- three gravel pit ponds at the eastern end of the property;
- a small cemetery located within a large grass field along the southern portion of the property bordering Broadwell Road;
- various asphalt driveways and parking lots; and
- three railroad spurs tying into the Norfolk and Western railroad line at the northern end of the Facility.

Based on the 2005 Anderson Township Comprehensive Plan, the Facility property and surrounding area is expected to remain zoned for industrial use in the future. In addition, it is possible for new construction to be performed at the Facility, in which case, construction workers involved with new building

construction could be exposed to Facility soils and subsurface water. If such work were to occur, it is expected that workers will be required to be covered by a site-specific Health and Safety Plan. There are, however, no current plans for construction of new buildings at the Facility.

2.1.2 Site Ownership History

The property on which the Facility is located was farmland until Baldwin Piano purchased the land and built a single manufacturing building in 1952[1]. Baldwin Piano manufactured pianos on the Facility until 1958 when it was sold to Heekin Can. Heekin Can cut, coated, printed, and assembled three piece cans on the property, and during the 1960s, constructed several additions to the original building. Starting in 1973, Heekin Can added two-piece can manufacturing operations using a drawn and iron process (D&I). This process was subsequently discontinued in 1989, but Heekin Can continued to operate its three piece can manufacturing process on the property until it was acquired by Ball in March 1993. Ball sold the property to Milton Can, a division of Bway, in 1996. Bway continues to manufacture three-piece steel cans at the Facility.

2.1.3 Facility Conditions

The Current Conditions Report (Payne, 2007) describes the current conditions at all SWMUs and AOCs identified in the PA/VSI (A.T. Kearney, 1989), and discusses any other past or present locations at the Facility for which Bway has information relating to past treatment, storage, or disposal of hazardous waste or hazardous constituents. In addition to the SWMUs and AOC identified during the PA/VSIs, Bway identified additional areas as Areas of Interest (AOI)s. The CCR also incorporates a summary and analysis of existing data available with regard to previous investigations and remedial actions at the Facility to identify areas on and off the property where additional investigations were recommended. A detailed summary of the history of the operations and waste activities at the Facility was presented in the PA/VSI report, and updated in the CCR (Payne Firm, 2007). For the purposes of this CMP, a general summary of the information in these reports requiring further investigation during the RFI is provided below.

- Historical operations at the Facility have influenced key areas on the property with regard to waste management practices.
- An area on the property (east of the present manufacturing plant) was excavated as a gravel pit as early as 1938 and was later used as a disposal area for various waste streams from the Facility and the

[1] The PR/VSI indicates that the site was used to manufacture munitions and bomb fuses prior to 1952. Subsequent investigations by ENVIRON in 1996, EMG in 1999, and the Payne Firm in 2007 have reviewed historical documents dating from 1900 and have concluded that these reports are unsubstantiated.

3.0 SUMMARY OF SITE RISKS AND CORRECTIVE MEASURES ASSESSMENT

The primary objective of the Corrective Action RFI was to characterize the nature and extent of any releases of hazardous wastes or hazardous constituents at or from the Facility, and to assess the potential significance of hypothetical risks associated with potential current and reasonably likely future human and ecological exposures to identified releases of Facility-related hazardous wastes or hazardous constituents. An evaluation of hypothetical human health risks under current conditions was provided in the *Resource Conservation and Recovery Act CA725 Environmental Indicators* Supporting *Documentation* (CA725 EI; 2016), which is included as Appendix II and summarized in Section 3.1 below. An evaluation of groundwater was provided in the *Resource Conservation and Recovery Act CA750 Environmental Indicators* Supporting *Documentation* (CA750 EI; 2016), which is included as Appendix III and summarized in Section 3.1 below. The ERA conducted as part of the RFI is provided as Appendix IV; a summary of the approved ERA is provided in Section 3.2 below.

3.1 Human Health

CA725 – Human Exposures Under Control

The human health risk assessment used site characterization data collected during the RFI field investigation to evaluate the potential significance of reasonable maximum exposures under current and reasonably expected future land use and groundwater use at and around the Site. As described in Section 2.1.1, on-property land use is currently industrial, and is reasonably expected to remain industrial in the future. Surrounding land use includes both commercial/industrial and some residential land uses. Based on these identified land uses, the potential receptors considered in the human health risk evaluation are summarized on Table 1 and include:

On-Site:
Routine workers
Maintenance workers
Construction workers
Trespassers

Off-Site:
Routine workers
Maintenance workers
Residents
Trespassers

OW-6										
DATE	T/D	AS	CR	FE	PB	MN	TL	PCE	TCE	VC
9/17/2014	T	1.4 J	18	1100	0.91 JB	44	0.12 JB	1.2	< 1 U	< 1 U
9/17/2014	D	0.84 JB	< 2 U	< 50 U	< 1 U	8	< 1 U	N/A	N/A	N/A
12/16/2014	T	1 J	15 Bj	310 Bu	0.27 JBj	13	< 1 U	1.8	0.15 J	< 1 U
12/16/2014	D	0.91 JB	1.3 JB	< 50 Uu	< 1 Uj	6 B	< 1 U	N/A	N/A	N/A
3/9/2015	T	<1.4 JBu	13 B	1000	0.84 JBu	34	< 1 U	1.8	< 1 U	< 1 U
3/9/2015	D	0.69 J	<1.4 JBu	< 50 U	< 1 U	5.1	< 1 U	N/A	N/A	N/A
5/19/2015		2.4 JB	19 B	2100	1.8	64	< 1 U	2	< 1 U	< 1 U
5/19/2015	D	1.2 JB	1.5 JB	< 50 U	0.17 JB	2 J	< 1 U	N/A	N/A	N/A

OW-2									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2.3 J	2.7	1500	2.8 B	72	1.5 B	< 1 U	< 1 U
9/17/2014	D	0.57 JB	< 2 U	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	5.2 Bj	3200 B	5.6 B	160	0.28 J	< 1 U	< 1 U
12/16/2014	D	0.65 JBj	1.2 J Bj	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
3/9/2015	T	4.2 JB	< 6.2 Bu	7100	6.1 B	390	0.088 J	< 1 U	< 1 U
3/9/2015	D	0.76 J	<1.4 JBu	< 50 U	0.26 J	1.3 J	0.3 J	N/A	N/A
5/19/2015	T	1.8 JB	2.6 B	2000 j	1.7	61	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.9 JB	1.6 JB	17 JB	0.42 JB	< 5 U	0.35 JB	N/A	N/A

OW-3									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	7.6	7.3	20000	11 B	1200	0.44 JB	29	< 1 U
9/17/2014	D	0.5 JB	< 2 U	< 50 U	< 1 U	320	< 1 U	N/A	N/A
12/16/2014	T	4.7 J	6.1 Bj	12000 B	6 B j	1400	0.12 J	11	< 1 U
12/16/2014	D	0.61 JBj	1.1 JBj	< 50 U	< 1 U	510 B	< 1 U	N/A	N/A
3/9/2015	T	4.5 JB	< 5.6 Bu	12000	6.5 B	890	0.096 J	11	< 1 U
3/9/2015	D	0.62 J	<1.3 JBu	< 50 U	0.13 J	550	0.11 J	N/A	N/A
5/19/2015	T	3.3 JB	4.7 B	8400	4.6	820	< 1 U	20	< 1 U
5/19/2015	D	1.1 JB	1.4 JB	< 50 U	0.25 JB	220	0.15 JB	N/A	N/A

OW-6D									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	13	35	3500	0.55 JB	240	0.12 JB	< 1 U	< 1 U
9/17/2014	D	7.2 B	30	2200	0.32 J	240	< 1 U	N/A	N/A
12/16/2014	T	9.1	44 B	2900 B	<0.33 JBu	240	< 1 U	< 1 U	< 1 U
12/16/2014	D	5.1 B	1.3 JBj	< 50 U	< 1 U	230 B	< 1 U	N/A	N/A
3/9/2015	T	13 B	45 B	4000	< 1 Bu	300	< 1 U	< 1 U	< 1 U
3/9/2015	D	6.4	<1.2 JBu	< 50 U	< 1 U	250	< 1 U	N/A	N/A
5/19/2015	T	8.1 B	2 B	1900	0.13 J	230	< 1 U	< 1 U	< 1 U
5/19/2015	D	5 B	2.6 B	140 B	0.17 JB	230	< 1 U	N/A	N/A

OW-4									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2 J	2.7	630	0.47 JB	64	0.29 JB	< 1 U	< 1 U
9/17/2014	D	1.5 JB	< 2 U	< 50 U	< 1 U	21	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	61 B	1200 B	0.9 JBj	98	0.085 J	< 1 U	< 1 U
12/16/2014	D	1.6 JBj	1.1 JBj	< 50 U	< 1 U	10 B j	< 1 U	N/A	N/A
3/9/2015	T	<1.8 JBu	< 2.7 Bu	160	< 0.19 JBu	15	< 1 U	< 1 U	< 1 U
3/9/2015	D	1.6 J	<1.2 JBu	< 50 U	< 1 U	3.3 J	0.092 J	N/A	N/A
5/19/2015	T	3.9 JB	110 B	3800	2.3	320	0.09 J	< 1 U	< 1 U
5/19/2015	D	1.5 JB	1.5 JB	< 50 U	0.21 JB	31	0.13 JB	N/A	N/A

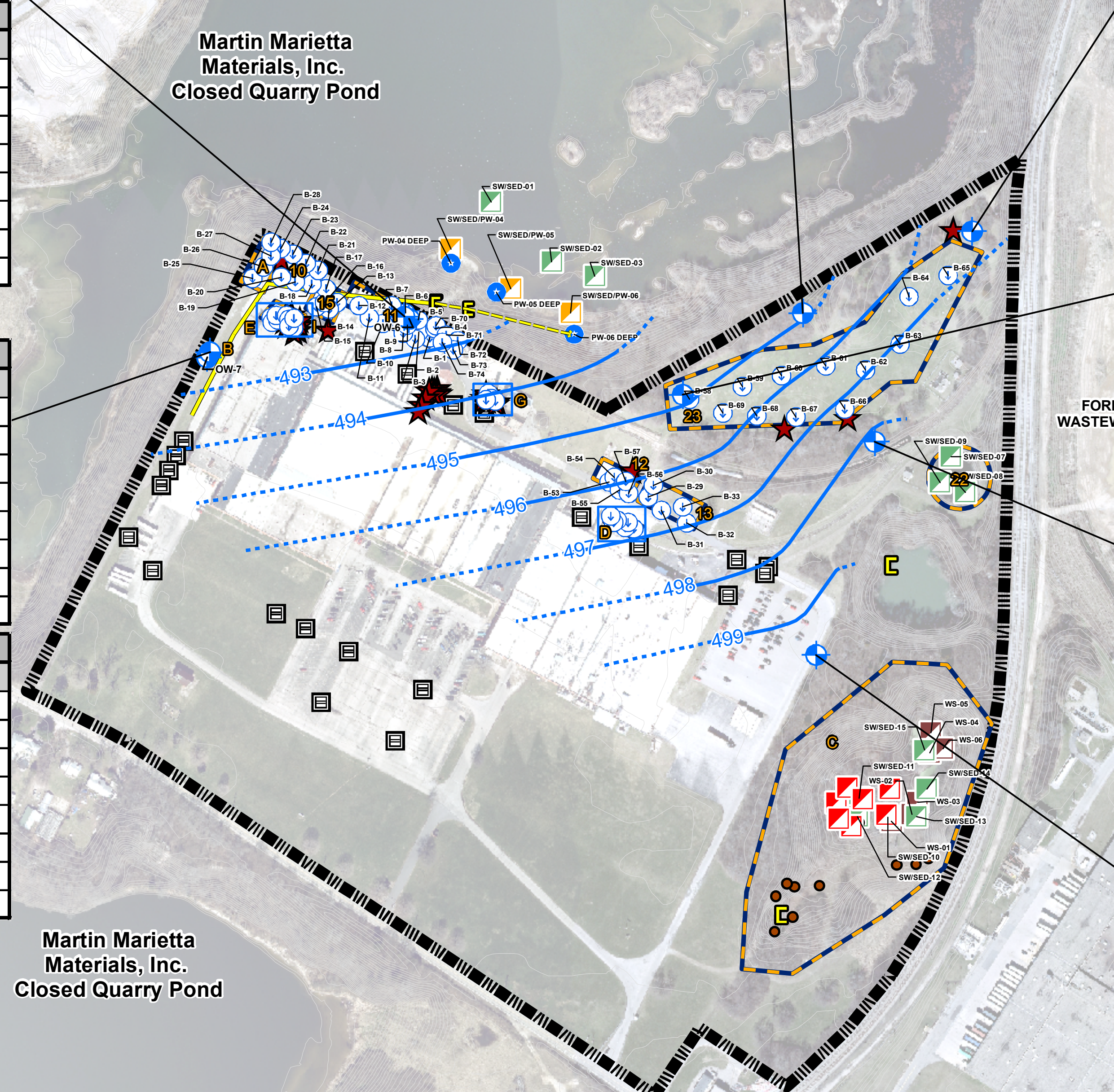
OW-7									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	0.63 J	2.1	290	0.19 JB	47	0.11 JB	< 1 U	< 1 U
9/17/2014	D	0.57 JB	< 2 U	< 50 U	< 1 U	37	< 1 U	N/A	N/A
12/16/2014	T	1 J	9.1 Bj	320 Bu	0.27 JBj	24	< 1 U	< 1 U	< 1 U
12/16/2014	D	0.85 JBj	2 Bj	< 50 U	< 1 U	11 Bj	< 1 U	N/A	N/A
3/9/2015	T	<2.2 JBu	33 B	2200	1.4 B	120	< 1 U	< 1 U	< 1 U
3/9/2015	D	0.88 J	< 3.2 Bu	< 50 U	< 1 U	6.2	< 1 U	N/A	N/A
5/19/2015	T	2.3 JB	41 B	2100	1.2	96	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.1 JB	1.4 JB	< 50 U	0.16 JB	6.5	< 1 U	N/A	N/A

SENCO PRODUCTS INC.
FORMER DISCHARGE POND FOR SANITARY WASTE WATER AND UNTREATED INDUSTRIAL PROCESS WASTEWATER INCLUDING OILS, METALS AND SPENT HALOGENATED AND NON-HALOGENATED SOLVENTS USED IN DEGREASING (F001, 002, 003, 005).
(Source: Ohio EPA Files; EDR Database Radius Report)

OW-1									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2.7 J	16	260	0.73 JB	9.2	0.99 JB	< 1 U	< 1 U
9/17/2014	D	2.1 JB	0.4 J	< 50 U	0.12 J	3.6 J	0.11 J	N/A	N/A
12/16/2014	T	2.4 J	1.5 JBj	180 Bu	0.29 JBj	8.1	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.3 J	1.4 JBj	< 50 U	0.17 J	< 5 U	0.23 J	N/A	N/A
3/9/2015	T	2.6 JB	< 2.2 Bu	240	<0.44 JBu	10	0.19 J	< 1 U	< 1 U
3/9/2015	D	2.2 J	<1.4 JBu	< 50 U	0.16 J	< 5 U	0.21 J	N/A	N/A
5/19/2015	T	2.6 JB	9.4 B	170	0.28 J	10	0.091 J	< 1 U	< 1 U
5/19/2015	D	3.1 JB	1.6 JB	22 JB	0.34 JB	< 5 U	0.23 JB	N/A	N/A

OW-7D									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	4.8 J	13	6600	0.19 JB	53	0.077 JB	< 1 U	< 1 U
9/17/2014	D	1.9 JB	< 2 U	380	< 1 U	46	< 1 U	N/A	N/A
12/16/2014	T	6.4	50 B	7200 B	0.83 JBj	71	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.2 JBj	1.2 JBj	62 Bu	< 1 U	40 B	< 1 U	N/A	N/A
3/9/2015	T	7.7 B	26 B	7200	<0.33 JBu	57	< 1 U	< 1 U	< 1 U
3/9/2015	D	3.2 J	<1.3 JBu	270	< 1 U	46	< 1 U	N/A	N/A
5/19/2015	T	8.5 B	2.9 B	7200	0.63 J	71	< 1 U	< 1 U	< 1 U
5/19/2015	D	2.9 JB	1.6 JB	< 50 U	0.13 JB	44	< 1 U	N/A	N/A

OW-5									
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	3.2 J	35	3000	1.8 B	270	0.26 JB	< 1 U	0.43 J
9/17/2014	D	1.3 JB	< 2 U	< 50 U	< 1 U	220	< 1 U	N/A	N/A
12/16/2014	T	1.5 J	2.5 B	550 B	0.33 JB	33	0.087 J	< 1 U	< 1 U
12/16/2014	D	0.94 JBj	1.1 JBj	< 50 U	< 1 U	15 Bj	< 1 U	N/A	N/A
3/9/2015	T	9.2 B	22 B	9900	4.9 B	370	0.2 J	< 1 U	< 1 U
3/9/2015	D	1 J	<1.2 JBu	< 50 U	< 1 U	20	< 1 U	N/A	N/A
5/19/2015	T	1.9 JB	3 B	940	0.6 J	23	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.4 JB	1.4 JB	< 50 U	0.22 JB	1.2 J	0.14 JB	N/A	N/A



LEGEND

- Groundwater Observation Well
- Groundwater Contours (5/19/2015)
- Groundwater Contours (extrapolated)
- BWAY Property Boundary
- 2 FT Ground Surface Contours
- SWMU, AOC, or AOI investigated area

RFI Sampling Locations

- Geoprobe Soil Sample Location
- Pore Water Sample Location
- Collocated Surface Water and Sediment Sample Location
- Collocated Surface Water, Sediment, and Pore Water Sample Location
- Shallow Wetland Soil Sample Location

N

0 200 400
Feet

legal shown

Notes
All samples reported in UG/L (micrograms per liter); QA/QC Duplicate samples not shown on figure.
AS = Arsenic; CR = Chromium; FE = Iron; PB = Lead; MN = Manganese; TL = Thallium; TCE = Trichloroethene; VC = Vinyl Chloride; PCE = Tetrachlorethene
RSL: USEPA Regional Screening Levels, November 2015 (Iron RSL = 15,000) (Manganese RSL = 480)
MCL: Maximum Contaminant Level enforceable standard of National Primary Drinking Water Regulations under Safe Drinking Water Act
(Arsenic MCL = **10**) (Chromium MCL = **100**) (Lead MCL = **15**) (Thallium MCL = **2**) (TCE MCL = **5**) (Vinyl Chloride MCL = **2**)
T/D: measured basis (metals only); T = total, D = dissolved
N/A: Not Analyzed
U: Test America Lab Qualifier. Nondetect.
J: Test America Lab Qualifier. Method blank contamination. The associated method blank contains the target analyte at a reportable level.
B: Test America Lab Qualifier. Estimated result. Result is less than the reporting limit.
j: TRC Qualifier. The analyte was not detected above the reporting sample quantitation limit. However, the reported quantitation limit is approx. and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
u: TRC Qualifier. The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

TITLE
GROUNDWATER SAMPLE LOCATIONS & RESULTS SINCE SEPTEMBER 2014

PROJECT
BWAY RCRA CORRECTIVE ACTION (RCRA-05-2007-0011)

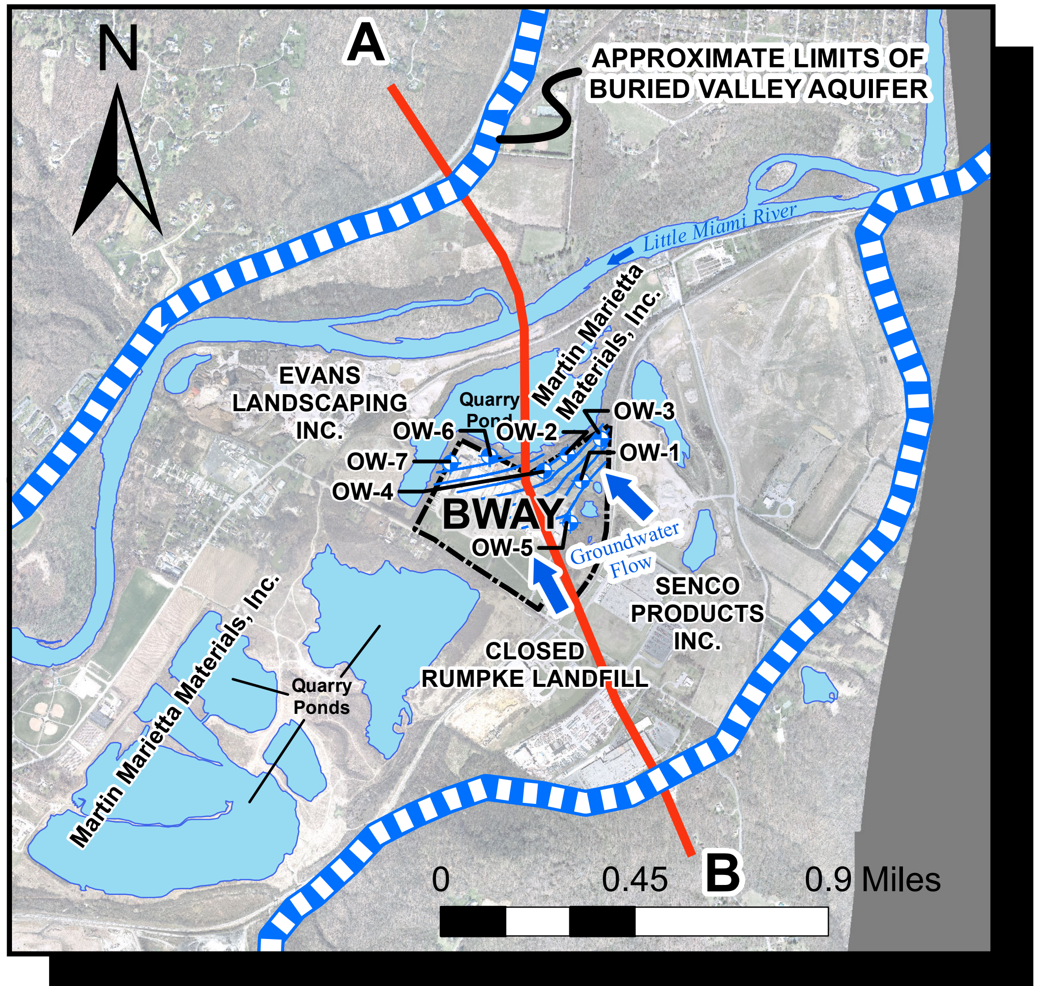
DATE *Tuesday, March 22, 2016*

FIGURE *1*

PROJECT NUMBER *214114*

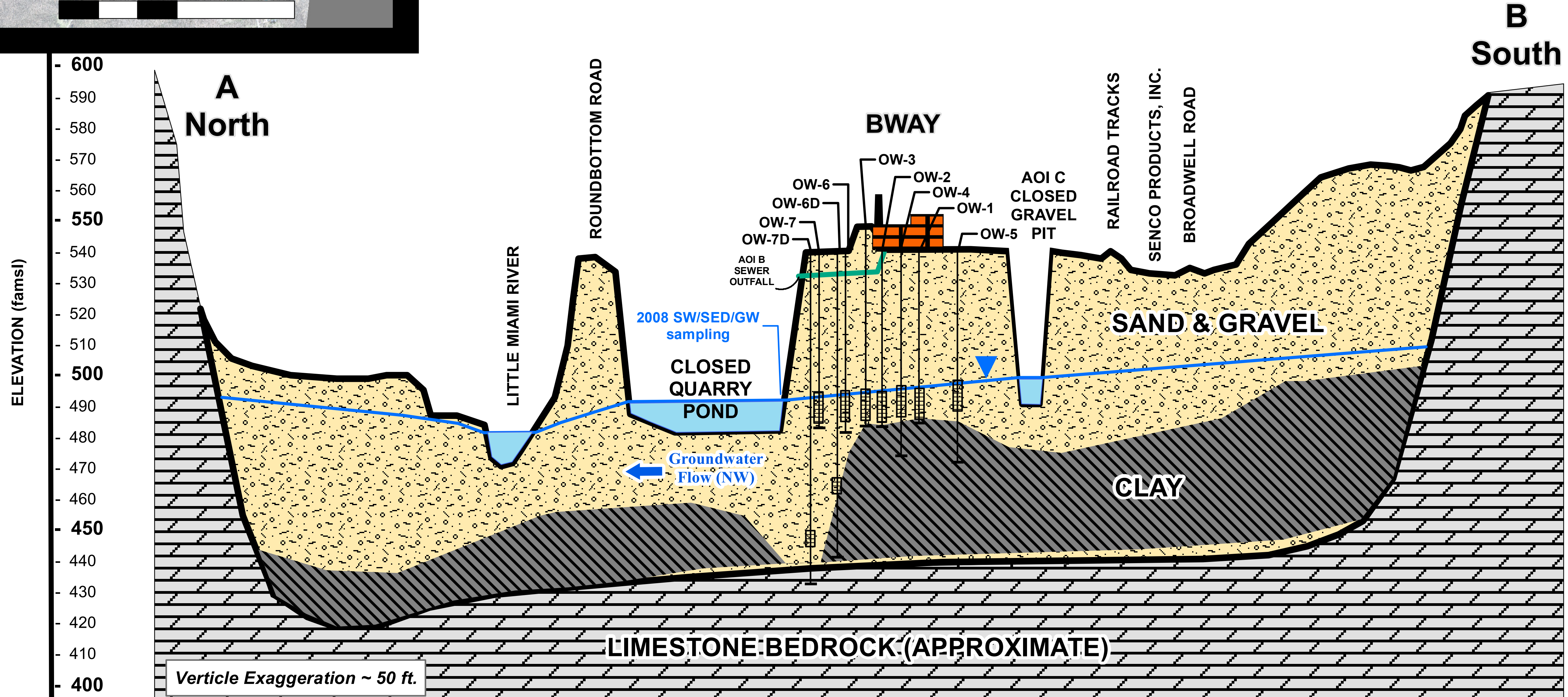
DRAWN BY *GIS*

TRC Results you can rely on
11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255
http://www.trcsolutions.com/



HYDROGEOLOGIC SUMMARY

- The site is underlain by the Little Miami River Buried Valley Aquifer and sits within the Little Miami River Watershed. The Little Miami River flows southwest of the site. Based on maps published by the Ohio EPA, the Facility is not located within a well field protection district.
- The Facility is located over a buried valley which is approximately 100 feet thick and 1 mile wide assigned to a portion of the U.S. EPA designated Greater Miami Sole Source Aquifer system.
- The unconsolidated deposits beneath the facility and in the vicinity of the Property generally consist of about 80 feet of sand and gravel deposits overlying about 30 feet of fine-grained, very-low permeability, glacial tills on top of bedrock.
- The underlying bedrock is composed of interbedded layers of shale and limestone belonging to the Kope Formation of Ordovician Age. The bedrock typically yields less than 5 gallons per minute to drilled wells and is not considered to be a significant aquifer.



modified from 1983 Burgess and Niple Hydrogeologic Investigation Report

G:\GIS_Projects\GIS_0654.13.00_Bway_CA\MXDs\CA750\Figure 4_Cross Section.mxd

PROJECT	BWAY - RCRA Corrective Action
TITLE	Geologic cross-section A to B (updated 2014)
FIGURE NO.	2
DATE	11/18/14
DRAWN BY	JAG/PMR
REQUESTED BY	KDK
PROJECT NO.	214114.0000

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Appendix B

Supplemental Groundwater Monitoring Results Tables

Table B-1a: Groundwater Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria
on	SWMU 23	VOC	Trichloroethene	79-01-6	T	HC	16	4	1.10E-02	2.90E-02	5.0E-03	SM	**5.8E+00**
on	SWMU 23	SVOC	Acetophenone	98-86-2	T	D	16	1	2.80E-04	2.80E-04	2.0E+00	NC	1.4E-04
on	SWMU 23	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	16	3	1.50E-03	3.40E-03	6.0E-03	SM	5.7E-01
on	SWMU 23	SVOC	Butylbenzylphthalate	85-68-7	T	C	16	2	2.00E-04	2.40E-04	4.1E-01	C	5.9E-04
on	SWMU 23	SVOC	Diethylphthalate	84-66-2	T	D	16	7	2.80E-04	8.80E-04	1.6E+01	NC	5.5E-05
on	SWMU 23	SVOC	Di-n-butylphthalate	84-74-2	T	D	16	1	4.10E-04	4.10E-04	2.0E+00	NC	2.1E-04
on	SWMU 23	SVOC	Di-n-octylphthalate	117-84-0	T		16	1	1.40E-03	1.40E-03	2.0E-01	NC	7.0E-03
on	SWMU 23	SVOC	Phenol	108-95-2	T	ID	16	4	4.90E-04	6.20E-04	6.0E+00	NC	1.0E-04
on	SWMU 23	INORG	Aluminum	7429-90-5	D	ID	16	2	9.10E-03	9.90E-03	2.0E+01	NC	5.0E-04
on	SWMU 23	INORG	Antimony	7440-36-0	D	ID	16	10	1.60E-04	5.50E-04	6.0E-03	SM	9.2E-02
on	SWMU 23	INORG	Arsenic	7440-38-2	D	A	16	16	5.00E-04	3.10E-03	1.0E-02	SM	3.1E-01
on	SWMU 23	INORG	Barium	7440-39-3	D	NC	16	16	4.20E-02	8.30E-02	2.0E+00	SM	4.2E-02
on	SWMU 23	INORG	Beryllium	7440-41-7	D	B1	16	13	6.00E-05	1.90E-03	4.0E-03	SM	4.8E-01
on	SWMU 23	INORG	Cadmium	7440-43-9	D	B1	16	10	6.30E-05	3.80E-04	5.0E-03	SM	7.6E-02
on	SWMU 23	INORG	Chromium (total)	7440-47-3	D		16	10	4.00E-04	1.70E-03	1.0E-01	SM	1.7E-02
on	SWMU 23	INORG	Cobalt	7440-48-4	D	LC	16	15	5.60E-05	9.30E-04	6.0E-03	NC	1.6E-01
on	SWMU 23	INORG	Copper	7440-50-8	D	D	16	7	9.00E-04	1.20E-03	1.3E+00	SM	9.2E-04
on	SWMU 23	INORG	Iron	7439-89-6	D	D	16	2	1.70E-02	2.20E-02	1.4E+01	NC	1.6E-03
on	SWMU 23	INORG	Lead	7439-92-1	D	B2	16	10	1.20E-04	4.20E-04	1.5E-02	SM	2.8E-02
on	SWMU 23	INORG	Manganese	7439-96-5	D	D	16	8	1.30E-03	5.50E-01	4.8E-01	NC	**1.1E+00**
on	SWMU 23	INORG	Nickel	7440-02-0	D	A	16	16	5.60E-04	4.40E-03	4.0E-01	NC	1.1E-02
on	SWMU 23	INORG	Selenium	7782-49-2	D	D	16	14	2.60E-04	1.70E-03	5.0E-02	SM	3.4E-02
on	SWMU 23	INORG	Silver	7440-22-4	D	D	16	2	2.00E-05	2.30E-05	1.0E-01	NC	2.3E-04
on	SWMU 23	INORG	Thallium	7440-28-0	D	ID	16	8	1.10E-04	3.50E-04	2.0E-03	SM	1.8E-01
on	SWMU 23	INORG	Vanadium	7440-62-2	D	ID	16	9	2.60E-04	2.50E-03	1.0E-01	NC	2.5E-02
on	SWMU 23	INORG	Zinc	7440-66-6	D	ID	16	1	7.40E-03	7.40E-03	6.0E+00	NC	1.2E-03
on	Unassigned	VOC	Tetrachloroethene	127-18-4	T	LC	24	4	1.20E-03	2.00E-03	5.0E-03	SM	4.0E-01
on	Unassigned	VOC	Trichloroethene	79-01-6	T	HC	24	1	1.50E-04	1.50E-04	5.0E-03	SM	3.0E-02
on	Unassigned	VOC	Vinyl Chloride	75-01-4	T	A	24	1	4.30E-04	4.30E-04	2.0E-03	SM	2.2E-01
on	Unassigned	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	24	3	2.00E-03	5.50E-03	6.0E-03	SM	9.2E-01
on	Unassigned	SVOC	Butylbenzylphthalate	85-68-7	T	C	24	2	2.20E-04	4.70E-04	4.1E-01	C	1.1E-03
on	Unassigned	SVOC	Diethylphthalate	84-66-2	T	D	24	9	3.10E-04	8.10E-04	1.6E+01	NC	5.1E-05
on	Unassigned	SVOC	Di-n-butylphthalate	84-74-2	T	D	24	2	4.10E-04	4.20E-04	2.0E+00	NC	2.1E-04
on	Unassigned	SVOC	Naphthalene	91-20-3	T	C	24	1	1.50E-04	1.50E-04	4.0E-01	NC	3.8E-04
on	Unassigned	SVOC	Phenol	108-95-2	T	ID	24	6	3.50E-04	6.80E-04	6.0E+00	NC	1.1E-04
on	Unassigned	INORG	Aluminum	7429-90-5	D	ID	24	2	9.20E-03	2.40E-01	2.0E+01	NC	1.2E-02
on	Unassigned	INORG	Antimony	7440-36-0	D	ID	24	11	1.70E-04	4.70E-04	6.0E-03	SM	7.8E-02
on	Unassigned	INORG	Arsenic	7440-38-2	D	A	24	24	5.70E-04	7.20E-03	1.0E-02	SM	7.2E-01
on	Unassigned	INORG	Barium	7440-39-3	D	NC	24	24	2.00E-02	4.30E-01	2.0E+00	SM	2.2E-01
on	Unassigned	INORG	Beryllium	7440-41-7	D	B1	24	15	5.40E-05	9.40E-04	4.0E-03	SM	2.4E-01
on	Unassigned	INORG	Cadmium	7440-43-9	D	B1	24	8	7.50E-05	2.30E-04	5.0E-03	SM	4.6E-02
on	Unassigned	INORG	Chromium (total)	7440-47-3	D		24	13	1.10E-03	3.00E-02	1.0E-01	SM	3.0E-01
on	Unassigned	INORG	Cobalt	7440-48-4	D	LC	24	21	1.80E-04	9.30E-04	6.0E-03	NC	1.6E-01
on	Unassigned	INORG	Copper	7440-50-8	D	D	24	4	8.80E-04	1.40E-03	1.3E+00	SM	1.1E-03
on	Unassigned	INORG	Iron	7439-89-6	D	D	24	4	1.40E-01	2.20E+00	1.4E+01	NC	1.6E-01
on	Unassigned	INORG	Lead	7439-92-1	D	B2	24	7	1.30E-04	3.20E-04	1.5E-02	SM	2.1E-02
on	Unassigned	INORG	Manganese	7439-96-5	D	D	24	24	1.20E-03	2.50E-01	4.8E-01	NC	5.2E-01
on	Unassigned	INORG	Mercury	7439-97-6	D	D	24	1	9.20E-05	9.20E-05	2.0E-03	SM	4.6E-02
on	Unassigned	INORG	Nickel	7440-02-0	D	A	24	23	2.90E-04	1.50E-02	4.0E-01	NC	3.8E-02
on	Unassigned	INORG	Selenium	7782-49-2	D	D	24	15	2.90E-04	7.00E-04	5.0E-02	SM	1.4E-02
on	Unassigned	INORG	Thallium	7440-28-0	D	ID	24	3	9.20E-05	1.40E-04	2.0E-03	SM	7.0E-02
on	Unassigned	INORG	Vanadium	7440-62-2	D	ID	24	11	2.90E-04	2.50E-03	1.0E-01	NC	2.5E-02
on	Unassigned	INORG	Zinc	7440-66-6	D	ID	24	1	9.80E-03	9.80E-03	6.0E+00	NC	1.6E-03

Notes:

Only constituents detected in each area are shown.

The drinking water criteria are based on the following hierarchy: State Maximum Contaminant Level (MCL), Federal MCL, USEPA Regional Screening Level (RSL) Tap Water Ingestion value (November 2015) at the lower of the criteria calculated at either the target cancer risk of 1E-5 or target hazard quotient of 1.

The criteria for Chromium (total) are the criteria provided by the agency for Chromium VI.

Ratios of concentration to the criteria greater than 1 are shaded in bold.

SM - The criterion is the State MCL.

C - The criterion is based on cancer risk at a target cancer risk of 1E-5.

NC - The criterion is based on noncancer effects at a hazard quotient of 1.

Chem Group - chemical group

Meas Basis - measured basis; T = total, D = dissolved

Carc Class - USEPA Weight-of-Evidence Cancer Classification

Table B-1b: Groundwater Samples Exceeding Screening Criteria Bway Corporation, Cincinnati, Ohio													
On/Off Site	**Area**	**Location**	**Sample ID**	**Sample Type**	**Sample Date**	**Chem Group**	**Chemical**	**CASRN**	**Meas Basis**	**Conc** (mg/L)	**Qual**	**Drinking Water Criteria** (mg/L)	**Ratio of Conc to Drinking Water Criteria**
on	SWMU 23	OW-3	OW-3/091714	N	09/17/14	VOC	Trichloroethene	79-01-6	T	2.90E-02		5.0E-03	**5.8E+00**
on	SWMU 23	OW-3	OW-3/121614	N	12/16/14	VOC	Trichloroethene	79-01-6	T	1.10E-02		5.0E-03	**2.2E+00**
on	SWMU 23	OW-3	OW-3/121614	N	12/16/14	INORG	Manganese	7439-96-5	D	5.10E-01	B	4.8E-01	**1.1E+00**
on	SWMU 23	OW-3	OW-3/030915	N	03/09/15	VOC	Trichloroethene	79-01-6	T	1.10E-02		5.0E-03	**2.2E+00**
on	SWMU 23	OW-3	OW-3/030915	N	03/09/15	INORG	Manganese	7439-96-5	D	5.50E-01		4.8E-01	**1.1E+00**
on	SWMU 23	OW-3	OW-3/051915	N	05/19/15	VOC	Trichloroethene	79-01-6	T	2.00E-02		5.0E-03	**4.0E+00**

Notes:

B = Estimated result. The result is less than the reporting limit.

1.0 INTRODUCTION

TRC Environmental Corporation (TRC) and Ramboll Environ US Corporation (Ramboll Environ) have prepared this Resource Conservation and Recovery Act (RCRA) Corrective Measures Proposal (CMP) on behalf of Bway Corporation (Bway). This CMP report was prepared to fulfill requirements agreed to under Paragraph VI 15 of the U.S. EPA Administrative Order on Consent (Streamlined Order) for the Bway metal container manufacturing facility (Facility) located at 8200 Broadwell Road, Cincinnati, Ohio (see Figure 1). The Streamlined Order, effective September 13, 2007, is an order in which Bway agrees to take corrective remedial measures necessary to protect human health and the environment from unacceptable risks due to releases of hazardous waste or hazardous constituents at or from the Facility. The term “Facility” refers to the Bway manufacturing facility operations located at the 8200 Broadwell Road property. The area referred to as “Site” includes both on- and off-property areas investigated during the RCRA Facility Investigation (RFI).

The overall objective of the Streamlined Order is for Bway to investigate, and as necessary, stabilize and remediate releases of hazardous waste or hazardous constituents originating from the Facility. To date, Bway has completed several activities to identify the nature and extent of hazardous waste and/or hazardous constituents releases at and from the Facility. The RFI activities have consisted of the following:

- Bway has determined whether a release of hazardous constituents to environmental media has occurred at AOIs, AOCs or SWMUs and determined Site-wide hydrogeologic conditions, as necessary, to investigate potential releases from AOIs, AOCs and SWMUs.
- Bway characterized the nature and extent of releases of hazardous constituents in or from the Facility and characterized actual and potential migration pathways, actual and potential human and environmental receptors, and current and reasonably expected future land and groundwater uses.
- Bway has assessed potential risk to human health and the environment associated with releases of hazardous constituents from the Facility on- and off-property;
- Bway has provided U.S. EPA sufficient data to support a demonstration that current human exposures to contamination above risk-based screening levels are under control (EI CA725), and that the migration of groundwater contaminated above appropriate screening levels is under control (EI CA750).
- As a result of the evaluations performed during the RFI activities, Bway has determined:
    - whether interim measures are necessary to control current unacceptable risks, if any, to human health or the environment, or to control migration of contaminated groundwater (if present); and

- whether a corrective measures evaluation is necessary to mitigate current and future unacceptable risks, if any, to human health and the environment.

1.1 General

Bway is the current owner/operator of the metal container manufacturing facility in Cincinnati. A previous owner/operator, Ball Corporation (Ball) is working with Bway to fulfil the requirements of the Streamlined Order. Potential constituents of concern were investigated beneath the Facility property and an adjacent closed quarry pond operated by Martin Marietta Materials, Inc. (Martin Marietta).

Results of the RFI were provided in quarterly progress reports submitted for EPA's review between 2007-2016. This CMP document relies upon the results of the RFI and the evaluation of these results presented in the documents listed below, which are referenced throughout this report. These documents present the Facility historical operations, hydrogeology, and the nature and extent determination of chemicals in soil and groundwater beneath the Site. Representative details of the environmental conditions at the Site are documented by boring logs, monitoring wells, figures, cross-sections and analytical data, which were summarized in tables, figures and appendices provided in the following referenced documents.

- March 2016, *RCRA, CA Ecological Risk Assessment Report*, Bway Corporation (ERA)
- March 2016, *RCRA, CA 725 Environmental Indicators Report,* Bway Corporation (CA725)
- March 2016, *RCRA, CA 750 Environmental Indicators Report,* Bway Corporation (CA750)
- November 2007, *Current Conditions Report*, Bway Corporation, (CCR)
- September 2007, Administrative Order on Consent, U.S. EPA Docket No. RCRA-05-2007-0011, Bway Corporation, (Streamlined Order)
- August 1989, *Preliminary Review/Visual Site Inspection Report*, Heekin Can Company (PA/VSI)

As specified in the Streamlined Order, public participation has occurred during the performance of the corrective action. All applicable reports are made available to the general public at the public repository established by Bway at the Cincinnati Public Library, Anderson Branch located at 7450 State Road, Cincinnati, Ohio 45230.

1.2 Report Organization

The CMP has been prepared to provide the information necessary for U.S. EPA to make a final remedy decision and prepare a Statement of Basis for the selected remedy. The CMP is organized as follows.

<u>Section</u>	<u>Topic</u>
1.0	Introduces the site, brief background, and purpose of the document.
2.0	Summarizes the Facility background including a summary of the RFI activities, descriptions of the local and reasonably anticipated future land use, former and current Facility operations, an overview of the site conceptual model and hydrogeological setting, water use and contaminants of interest.
3.0	Summarizes the results of the human health and ecological risk assessments.
4.0	Provides an overview of the corrective measures proposal including corrective measures objectives, performance standards, and the proposed corrective measures to address objectives and standards.
5.0	Discusses public participation in the corrective measures process.
6.0	Provides references.

2.0 FACILITY BACKGROUND

2.1 Site and Area Description

2.1.1 Facility and Area Land Use

The Facility is located at 8200 Broadwell Road in the Township of Anderson, Ohio at 39º 08’21” North latitude and 84º 19’15” West longitude. Anderson Township is located in the east-central portion of Hamilton County, which is located in the southwestern portion of Ohio (Figure 1). The bordering Clermont County is located approximately one mile east of the Facility. The Little Miami River flows to the southwest and is approximately 0.25 miles from the northwest corner of the property. The nearest major city is the City of Cincinnati, which is located approximately five miles to the west of the Facility.

The property is comprised of two parcels totalling 77 acres and is bound by Broadwell Road to the south (there is a closed construction demolition debris landfill located across Broadwell Road); a Norfolk and Western railroad to the east boarded by the SENCO metal fastener industrial facility; and closed quarry ponds to the north and west owned by Martin Marietta.

The Facility main manufacturing building is comprised of various building additions that have been constructed over time since the 1950’s. As shown on Figure 2, the primary features at the Facility include:

- the main manufacturing building and warehouse with connected offices;
- a treated sanitary wastewater storage pond;
- a sanitary biological treatment plant and a former land-application sprayfield located in the northeast corner of the Facility;
- three gravel pit ponds at the eastern end of the property;
- a small cemetery located within a large grass field along the southern portion of the property bordering Broadwell Road;
- various asphalt driveways and parking lots; and
- three railroad spurs tying into the Norfolk and Western railroad line at the northern end of the Facility.

Based on the 2005 Anderson Township Comprehensive Plan, the Facility property and surrounding area is expected to remain zoned for industrial use in the future. In addition, it is possible for new construction to be performed at the Facility, in which case, construction workers involved with new building

construction could be exposed to Facility soils and subsurface water. If such work were to occur, it is expected that workers will be required to be covered by a site-specific Health and Safety Plan. There are, however, no current plans for construction of new buildings at the Facility.

2.1.2 Site Ownership History

The property on which the Facility is located was farmland until Baldwin Piano purchased the land and built a single manufacturing building in 1952[1]. Baldwin Piano manufactured pianos on the Facility until 1958 when it was sold to Heekin Can. Heekin Can cut, coated, printed, and assembled three piece cans on the property, and during the 1960s, constructed several additions to the original building. Starting in 1973, Heekin Can added two-piece can manufacturing operations using a drawn and iron process (D&I). This process was subsequently discontinued in 1989, but Heekin Can continued to operate its three piece can manufacturing process on the property until it was acquired by Ball in March 1993. Ball sold the property to Milton Can, a division of Bway, in 1996. Bway continues to manufacture three-piece steel cans at the Facility.

2.1.3 Facility Conditions

The Current Conditions Report (Payne, 2007) describes the current conditions at all SWMUs and AOCs identified in the PA/VSI (A.T. Kearney, 1989), and discusses any other past or present locations at the Facility for which Bway has information relating to past treatment, storage, or disposal of hazardous waste or hazardous constituents. In addition to the SWMUs and AOC identified during the PA/VSIs, Bway identified additional areas as Areas of Interest (AOI)s. The CCR also incorporates a summary and analysis of existing data available with regard to previous investigations and remedial actions at the Facility to identify areas on and off the property where additional investigations were recommended. A detailed summary of the history of the operations and waste activities at the Facility was presented in the PA/VSI report, and updated in the CCR (Payne Firm, 2007). For the purposes of this CMP, a general summary of the information in these reports requiring further investigation during the RFI is provided below.

- Historical operations at the Facility have influenced key areas on the property with regard to waste management practices.
- An area on the property (east of the present manufacturing plant) was excavated as a gravel pit as early as 1938 and was later used as a disposal area for various waste streams from the Facility and the

[1] The PR/VSI indicates that the site was used to manufacture munitions and bomb fuses prior to 1952. Subsequent investigations by ENVIRON in 1996, EMG in 1999, and the Payne Firm in 2007 have reviewed historical documents dating from 1900 and have concluded that these reports are unsubstantiated.

surrounding community. Most debris has been removed previously. This former debris area is identified as AOI C.

- Prior to the construction of the former land-application treatment system in 1987, the Facility industrial wastewater treatment consisted of chromium reduction, pH adjustment, flocculation, and settling. Former treated process wastewater from the D&I operation was discharged into an off-property gravel pit to the north (closed quarry ponds) from approximately 1973 to 1987. The sewer line that transported the Facility treated wastewater is identified as AOI B. This former effluent from the Facility industrial wastewater treatment was characterized by high concentrations of COD, dissolved solids, sulfates, chlorides, and fluorides.
- Outdoor drum storage (empty, chemical product, and waste) at the Facility was a waste management practice started in the early 1960s that was discontinued no later than 2001. These areas comprise several SWMUs and one AOC.
- As demonstrated during the RFI, no unacceptable exposures to Facility-related soil or groundwater currently exist. Even though the TCE and some metals were detected beneath a portion of the Facility (see Section 3.1), these constituents are attributable to an upgradient source(s) unrelated to the Facility operations.
- Based on the low levels of constituents detected in groundwater at the Site, and the presence of an upgradient off-site source, there is no evidence of site-related releases to groundwater at the Facility subject to RCRA Corrective Action.

2.2 Hydrogeological Setting

Information relating to the hydrogeologic setting of the Site was assembled during the RFI to develop a site hydrogeological model (SHM). The SHM describes the primary aquifer system, the Little Miami River Buried Valley Aquifer and surrounding bedrock system as summarized below.

- The site is underlain by the Little Miami River Buried Valley Aquifer and sits within the Little Miami River Watershed. The Little Miami River flows southwest of the site. Based on maps published by the Ohio EPA, the Facility is not located within a well field protection district.
- The Facility is located over a buried valley which is approximately 100 feet thick and 1 mile wide assigned to a portion of the U.S. EPA designated Greater Miami Sole Source Aquifer system.
- The unconsolidated deposits beneath the facility and in the vicinity of the Property generally consist of about 80 feet of sand and gravel deposits overlying about 30 feet of fine-grained, very-low permeability, glacial tills on top of bedrock.
- The underlying bedrock is composed of interbedded layers of shale and limestone belonging to the Kope Formation of Ordovician Age. The bedrock typically yields less than 5 gallons per minute to drilled wells and is not considered to be a significant aquifer.

- The direction of groundwater movement in the vicinity of the Facility was determined to be northwest towards the adjacent flooded quarry pond which is upgradient to the Little Miami River.
- The rate of groundwater movement under the Facility is in the range of 1 to 10 feet per day.
- Cross Section A-B (north-south alignment) provided on Figure 4 shows the geologic conditions of the buried valley in the vicinity of the Facility. In general, the unconsolidated materials consist of the glacial outwash sand and gravel overlying a continuous layer of fine-grained glacial till deposits on top of bedrock.

2.3 Water Supply and Groundwater Use

This section summarizes the current uses of groundwater at and in the vicinity of the Site.

Based on well field protection district maps published by the Ohio EPA, the Facility is not located within a well field protection district. The unconsolidated aquifer beneath the Facility is assigned to a portion of the U.S. EPA designated Greater Miami Sole Source Aquifer system. The Sole Source Aquifer designation protects an area’s groundwater resource by requiring U.S. EPA to review certain proposed projects within the designated area. Water for the plant operation is currently provided by the Cincinnati Water Works. There are public water supplies in the area which obtain their source of water from wells completed in the buried valley deposits readily available from the public distribution systems of Cincinnati, Milford or Indian Hill municipalities.

In the past, several industries (including the Facility) in the area had private wells as a source of water supply. Many have converted to the municipal water system since it became available in the region in the mid-1960s. The on-Facility production wells were closed and no active water supply well exists at the Facility. Potable water at and around the Site is supplied by municipal systems. Groundwater is not currently used as a potable or nonpotable water supply at the Site. In addition, the depth to ground water at the site is approximately 50 feet or greater below ground surface and below the depth of the deepest utilities, which precludes potential exposures to maintenance workers. The results of the well search identified one downgradient off-site well. Discussions with the Ohio Department of Health and the Hamilton County Department of Health in September 2015 verified that there are no records of this wellbeing in use. In addition, a visit in October 2015 with a representative of USEPA to the parcel where the well was formerly located indicated that the property is currently a gravel pit with no residential structure present. Therefore, there are no active potable wells downgradient of the site.

2.4 Summary of Facility Investigations

Prior to the Streamlined Order, Bway voluntarily conducted environmental investigation and remediation activities at the Facility as detailed in the CCR (Payne Firm, 2007). Past investigations included general due diligence for potential sale of the property and investigations that focused on areas meriting Phase II investigation based on the findings of the due diligence. These activities led to Bway's:

- preliminary determination of the nature and extent of potential contaminant source areas at the Facility; and
- initial determination of the nature and extent of groundwater conditions at the Facility.

2.4.1 RFI Summary

Bway conducted a Corrective Action RFI between August 2007 and December 2016 for 1) determining that current human exposures (EI CA725) were under control, and 2) determining that the migration of contaminated groundwater (EI CA750) was under control. Bway provided Sampling and Analysis Plans for each phase of the planned RFI field activities. The sampling locations from all phases of the RFI are provided on Figure 3. Final approval of the CA725 EI and CA750 EI was provided by the U.S. EPA on September 23, 2016 and September 16, 2016, respectively. In addition, Bway prepared an Ecological Risk Assessment Report that was submitted in March 2016 and approved by U.S. EPA on October 4, 2016. At the request of U.S. EPA, Relevant documents provided as appendices to this CMP include:

I: Sampling and Analysis Plans
II: CA725 Environmental Indicator Supporting Documentation
III: CA750 Environmental Indicator Supporting Documentation
IV: Ecological Risk Assessment Report

2.4.2 Contaminants of Interest

A site-specific sampling list of chemicals was developed (Payne Firm, 2007) and approved by U.S. EPA for the RFI to investigate a number of primarily low release potential SWMUs and AOCs identified at the Site in U.S. EPA's PA/VSI report (Kearney, 1989). This list included VOCs, SVOCs and metals that had been used in Bway's manufacturing process. As documented in the CA725 (Appendix III) and the ERA (Appendix IV), VOCs, SVOCs and metals were detected in the sampled environmental media. However, with the exception of a limited number of constituents, the concentrations of detected constituents generally did not exceed the MCLs for drinking water or the risk-based screening criteria selected for the Site based on the conceptual site model for potential human exposures (see Table 1). For those limited constituents that exceed the screening criteria, potential human exposures were determined to not be significant under current conditions in the context of the CA725. In addition, the results of the ERA

(Section 3.2) performed for the Site indicated that potential releases of hazardous constituents from the Facility do not pose ecologically significant impacts to populations, communities, or ecosystems.

As discussed in Section 3, the concentrations of COIs in groundwater exceed drinking water MCLs and may result in unacceptable exposures if groundwater is used for potable and/or nonpotable purposes under hypothetical future conditions.

2.4.3 Media of Interest

The RFI characterized the nature and extent of contamination within the context of the potential significance of hazardous constituent concentrations (relative to background levels, and/or U.S. EPA risk-based screening criteria or drinking water standards). The media sampled to meet the objectives of the RFI included the following:

- Surface Water
- Sediment
- Soil (0 to 2 feet; and at selected intervals down to maximum depth of approximately 32 feet below ground surface)
- Porewater
- Groundwater

3.0 SUMMARY OF SITE RISKS AND CORRECTIVE MEASURES ASSESSMENT

The primary objective of the Corrective Action RFI was to characterize the nature and extent of any releases of hazardous wastes or hazardous constituents at or from the Facility, and to assess the potential significance of hypothetical risks associated with potential current and reasonably likely future human and ecological exposures to identified releases of Facility-related hazardous wastes or hazardous constituents. An evaluation of hypothetical human health risks under current conditions was provided in the *Resource Conservation and Recovery Act CA725 Environmental Indicators* Supporting *Documentation* (CA725 EI; 2016), which is included as Appendix II and summarized in Section 3.1 below. An evaluation of groundwater was provided in the *Resource Conservation and Recovery Act CA750 Environmental Indicators* Supporting *Documentation* (CA750 EI; 2016), which is included as Appendix III and summarized in Section 3.1 below. The ERA conducted as part of the RFI is provided as Appendix IV; a summary of the approved ERA is provided in Section 3.2 below.

3.1 Human Health

<u>CA725 – Human Exposures Under Control</u>
The human health risk assessment used site characterization data collected during the RFI field investigation to evaluate the potential significance of reasonable maximum exposures under current and reasonably expected future land use and groundwater use at and around the Site. As described in Section 2.1.1, on-property land use is currently industrial, and is reasonably expected to remain industrial in the future. Surrounding land use includes both commercial/industrial and some residential land uses. Based on these identified land uses, the potential receptors considered in the human health risk evaluation are summarized on Table 1 and include:

<u>On-Site</u>:
Routine workers
Maintenance workers
Construction workers
Trespassers

<u>Off-Site</u>:
Routine workers
Maintenance workers
Residents
Trespassers

Potential exposures of the receptors listed above to chemicals in soil, groundwater, surface water, sediment and air were assessed. Each media was evaluated for the presence of "contamination." Of these media, groundwater, surface water and sediment were determined to be "contaminated" based on a comparison to risk-based residential and industrial screening levels. Soil and air[2] did not meet the definition of contamination.

Potentially complete human exposure pathways were identified for surface water and sediment, but not groundwater[3]. Groundwater "contamination" was identified for a limited number of constituents at the Site based on comparison to drinking water criteria[4]. When the magnitude of potential exposures and current site-specific conditions are considered, however, the concentrations of constituents in the soil, groundwater, surface water and sediment do not present a significant exposure. Therefore, based on data collected as part of the RFI, and considering potential exposure pathways and site-specific conditions, current human exposures were determined to be under control according to the provisions of the CA725.

CA750 – Groundwater Migration under Control

The *Resource Conservation and Recovery Act CA750 Environmental Indicators Supporting Documentation* (CA750 EI; 2016) is included as Appendix III. As shown on Table 3-1b, the concentration of TCE that exceeds the drinking water criterion is limited to the background well OW-3, the eastern most monitoring well on the site (see Figure 5). As discussed in the CCR (Payne Firm, 2007) and Quarterly Progress Reports, based on consistent groundwater flow direction to the northwest, the TCE in OW-3 likely originated from an upgradient off-property source(s); a full package documenting conditions at the upgradient site was provided to EPA with the CA750 (see Appendix III). Given the low levels of constituents detected in groundwater at the Facility, and the presence of an upgradient off-property source of TCE, there is no evidence of Facility-related releases to groundwater subject to RCRA Corrective Action.

Although not believed to be Facility-related, the TCE contamination has not migrated off-property. Furthermore, any downgradient migration off-property would effectively be intercepted by the quarry pond directly west of the facility. It was also determined that such contaminant migration to surface water, if any, would be insignificant. The findings of the CA750 support a determination that the migration of "contaminated" groundwater is under control at the Site. In support of U.S. EPA's Statement of Basis, Bway will be continue groundwater monitoring as specified in U.S. EPA's EI CA750.

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[2] TCE was detected in the upgradient monitoring well that is being impacted by an offsite source and is not Facility related. In addition, the contaminated groundwater is over 1,200 feet away from the nearest Facility building. Therefore, the groundwater vapor to indoor air pathway is not complete.

[3] Groundwater is not used for potable or non-potable use at the Facility. The depth to groundwater is over 50 feet below ground surface. Therefore, there is no complete groundwater exposure pathway.

[4] Groundwater "contamination" was identified for a limited number of metals (As, Cr, Fe, Pb, Mn, and Th) and trichloroethene (TCE) at the Site based on comparison to drinking water criteria.

Identification of Exposures Warranting Corrective Measures

As discussed in the CA750, based on the low levels of constituents detected in groundwater at the Site, and the presence of TCE attributed to an upgradient off-property source(s), there is no evidence of Facility-related releases to groundwater subject to RCRA Corrective Action. An evaluation of where a release of hazardous waste or constituents from the Facility that may cause reasonable maximum exposures to be significant enough in the future to warrant consideration in this CMP are summarized on Table 2 and described as follows:

- Potential exposure of routine workers from on-property potable groundwater use.
  Groundwater concentrations for a limited number of constituents have exceeded drinking water criteria during the RFI quarterly monitoring. Groundwater is currently not used for drinking water at the Facility, but in the absence of corrective measures, the potential exists for unacceptable exposures in the future if groundwater exceeding these criteria is used for potable water.

- Potential exposure of routine workers from Facility nonpotable groundwater use.
  Although future nonpotable use is not reasonably expected because the Facility is expected to continue to be connected to the municipal water supply, such use cannot be ruled out. An evaluation of the potential significance of nonpotable groundwater exposures should be assessed in the future if such use is contemplated and the specific types of use and associated potential exposures are known.

With the exception of these potentially significant future exposure conditions, human exposure scenarios and the potential significance of exposures is not expected to change under reasonably likely future conditions. Therefore, no other potentially significant future exposures requiring corrective measures have been identified.

3.2 Ecological

As part of the RFI, an ecological risk assessment (ERA) was conducted to assess the potential for significant exposures of ecological receptors to Facility-related releases of hazardous waste and/or hazardous constituents characterized during the RFI. The ERA conducted for this RFI is comprised of a screening level ecological risk assessment (SLERA), and Step 3a of a baseline ecological risk assessment (BERA), which consists of a refinement of the exposure estimates and risk calculations used in the SLERA. The ERA used the site characterization data that have been collected during the RFI to assess potential risks to ecological receptors that may be exposed to Facility-related constituents in soil, sediment and surface water at and near the Site.

A summary of the findings and the conclusion of the approved ERA are as follows:

- Threatened and endangered species are not likely present within the study area.

- Several constituents are present in surface water, sediment, and surface soil at concentrations that exceed relevant conservative screening values; exceedances of these criteria indicated that more detailed and focused risk assessment was warranted.

- The potential for complete exposure pathways between potentially site-related constituents and ecological receptors were identified in one AOC investigated during the RFI (AOI B, the off-site quarry pond). Therefore, the BERA focused on the following assessment endpoints where these conditions were identified:

    - Benthic invertebrate community structure and function;
    - Fish community structure and function;
    - Survival and reproduction of aquatic-feeding bird and mammal populations; and
    - Survival and reproduction of terrestrial-feeding bird and mammal populations.

- Step 3a of the BERA included a comprehensive desk-top analysis of available information regarding the above-listed assessment endpoints, using well accepted USEPA equilibrium partitioning, food web modelling, and other appropriate analyses related to refined exposure and effects assumptions for evaluating the potential risks associated with constituents that exceeded screening criteria. Step 3a also considered the additive toxicity of classes of compounds, such as PAHs and metal mixtures.

- The conclusions associated with each of these assessment endpoints were as follows:

    - Benthic invertebrate community structure and function. The overall conclusion regarding the benthic community structure and function is that the only constituent, or class of constituents, that seems to potentially pose a risk to the benthic community are PAHs, and this potential risk is isolated to portions of the closed quarry pond (AOI B). Specifically, the analysis of additive impacts to benthic invertebrates was performed using USEPA's equilibrium partitioning approach, and those results showed that PAHs could pose a potential impact to benthic diversity in very isolated locations within AOI B. However, it does not appear that the PAHs identified in the quarry pond are from site-related releases. In addition, the owner of the quarry pond (Martin Marietta) is in the process of pursuing a permit to resume operations of the quarry pond. These operations are expected to diminish the ecological diversity and value of the pond, and therefore, the potential for adverse effects associated with detected PAH concentrations in sediments is considered insignificant by comparison.

– Fish community structure and function. The overall conclusion regarding fish community structure and function is that adverse impacts are not likely to occur due to site-related constituents.

– Survival and reproduction of aquatic- and terrestrial-feeding wildlife populations. The overall conclusion regarding survival and reproduction of aquatic- and terrestrial-feeding wildlife is that adverse impacts are not likely to occur due to site-related constituents.

Based on this information, the results are sufficient to conclude that potential releases of hazardous constituents at or from the Bway Facility do not pose ecologically significant impacts to populations, communities, or ecosystems. Therefore, corrective measures are not warranted on the basis of ecological risk.

4.0 SUMMARY OF CORRECTIVE MEASURES PROPOSAL

The results of the RFI completed by Bway, including the assessment of potential human health and ecological risks associated with constituent concentrations detected at and near the Facility, indicated the presence of COCs in groundwater at concentrations warranting consideration in this corrective measures proposal. As discussed in Section 3.1, the presence of COCs in groundwater at the Site is not identified as being related to a release at the Facility. Nonetheless, the potential for human exposures to these COCs in groundwater is addressed by this CMP.

The exposure media and exposure pathways addressed by this CMP, and the objectives for the proposed corrective measures are discussed below.

4.1 Summary of Potentially Significant Exposures

As discussed in Section 3, a limited number of constituents were detected during the RFI at concentrations exceeding drinking water criteria. Groundwater is currently not used for drinking water at the Facility, but in the absence of corrective measures, the potential exists for unacceptable exposures in the future if groundwater exceeding these criteria is used for potable water.

Although future nonpotable use is not reasonably expected because the Facility is expected to continue to be connected to the municipal water supply, such use cannot be ruled out. An evaluation of the potential significance of nonpotable groundwater exposures should be assessed in the future if such use is contemplated and the specific types of use and associated potential exposures are known.

4.2 Corrective Measures Objectives

Corrective Measures Objectives (CMOs) consist of medium-specific or pathway-specific goals for protecting human health and the environment. CMOs for protecting human health should express both a contaminant level (e.g., remediation target concentration) and an exposure route, rather than contaminant levels alone, because protectiveness may be achieved by reducing exposures as well as by reducing contaminant levels. The proposed CMOs used for the Site to identify and evaluate possible corrective measures for on- and off-Facility areas have been developed based on the results of the RFI baseline risk assessment.

The proposed CMOs for the Site are presented on Table 2 and summarized below.

<u>On-Property</u>

- Prevent unacceptable exposures to COCs in groundwater via potable and nonpotable use.

<u>Off-Property</u>

- No potentially significant current or future exposures have been identified off-property requiring corrective measures.

4.3 Proposed Corrective Measure

Per the Streamlined Order, Bway has determined that a corrective measures evaluation is necessary to mitigate potential future unacceptable risks to human health. Based on the findings of the RFI, potentially significant Facility-related releases of hazardous waste and/or constituents were not detected at the Site. Therefore, a corrective measures evaluation is not warranted for Facility-related releases. However, COCs at levels of concern in groundwater resulting from migration onto the Bway Facility from an upgradient source has been defined. Therefore, Bway is proposing corrective measures to prevent potential unacceptable exposures using institutional controls that impose restrictions on future use of groundwater at the Facility unless it can be demonstrated that there is no unacceptable risks or that risks can be mitigated at the time such use is planned. Bway will also restrict future land use to commercial/industrial activities.

4.3.1 Performance Standards and Monitoring

For groundwater that will likely remain contaminated for a considerable period of time, EPA guidance provides that some form of institutional control will typically be a critical part of the groundwater remedy to prevent exposure [5]. Therefore, institutional controls should be evaluated, implemented, and monitored just like any other component of a remedy needed to ensure protection (EPA, 2004).

Performance standards by which the proposed corrective measure will be assessed are summarized below.

- Demonstrations that on-property institutional controls via an Environmental Covenant[6] are in place to control potential exposures to groundwater will include documentation that a:

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[5] "EPA expects to use institutional controls, such as water and land use restrictions, primarily to supplement engineering controls as appropriate to prevent or limit exposure to hazardous waste and constituents." EPA, 1996. Advance Notice of Proposed Rulemaking (61 FR 19432, May 1).

[6] In December 2004, Ohio enacted an environmental covenants act (Ohio Revised Code 5301.80 – 5301.92) to ensure the ability to implement and enforce institutional (land use) controls. The statutory legal mechanism created by Ohio's Uniform Environmental Covenants Act (UECA) is called an "environmental covenant."

- Deed restriction to commercial/industrial land use is filed with the appropriate governmental agency for the Facility.
- Deed restriction prohibiting groundwater use is filed with the appropriate governmental agency for the Facility.
- Visual inspection of the site is conducted annually to confirm that land use inconsistent with these controls has not occurred.

The following documentation will be generated to demonstrate performance.

- Deed restrictions identified above will be filed with the Hamilton County, Ohio Auditor's Office for attachment to the property deed. Once accepted by Hamilton County, copies of the approved deed restrictions will be provided to U.S. EPA.

Finally, in support of U.S. EPA's Statement of Basis, Bway will be continue groundwater monitoring as specified in U.S. EPA's EI CA750.

5.0 PUBLIC PARTICIPATION AND IMPLEMENTATION

5.1 Mechanisms for Public Participation

All applicable reports are made available to the general public at the public repository established by Bway at the Cincinnati Public Library, Anderson Branch located at 7450 State Road, Cincinnati, Ohio 45230.

Following U.S. EPA's review and comment of Bway's CMP, U.S. EPA will prepare a Statement of Basis documenting its approved corrective measures, and provide the public with an opportunity to review it's the proposed corrective measures. Following the public comment period, U.S. EPA will select the final Corrective Measures to be implemented by Bway in a timely manner, and provide notification of its decision and rationale in a "Final Decision and Response to Comments" ("Final Decision").

5.2 Corrective Measures Implementation Order

Upon acceptance of Bway's Final CMP, the U.S. EPA and Bway may negotiate a Corrective Measures Implementation Order (CMI) to document the performance standards and requirements associated with implementation and operation of the chosen remedy.

The CMI Order will ensure that the long-term requirements for operation and maintenance of the chosen remedy, including any monitoring and institutional controls, are defined and adhered to until the corrective measures are deemed complete or no longer required.

6.0 REFERENCES

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Tables

Table 1: Conceptual Site Model for Potential Human Exposures
Bway Corporation, Cincinnati, Ohio

Receptor Population	Exposure Medium	Exposure Route	Possible Currently?	Possible in Future?	Type of Analysis	Comments
On-Site						
Routine Workers	surface soil	incidental ingestion of and dermal contact with surface soil	Yes	Yes	Quantitative	The property is comprised of the: developed operational area; developed non-operational area; and, undeveloped eastern area. The developed operational portion of the property is covered either with buildings or concrete and asphalt making direct contact to soil unlikely. The developed non-operational area consists primarily of lawn, where potential exposure may occur during routine activities and during seasonal grass mowing. Potential exposures to soil in the undeveloped eastern portion of the property is unlikely. Potential exposures could occur in the developed areas without pavement and areas where pavement is removed in the future.
		inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	Yes	Yes	Quantitative	
		inhalation of soil-derived vapors that migrate through building foundations into indoor air	Yes	Yes	Quantitative	
	subsurface soil	inhalation of soil-derived vapors in ambient air	Yes	Yes	Quantitative	Potential exposure to subsurface soil vapors in ambient air is possible in areas without pavement and where pavement might be removed in the future.
		inhalation of soil-derived vapors that migrate through building foundations into indoor air	Yes	Yes	Quantitative	Potential exposure via vapor intrusion through cracks in building foundations into indoor air are possible if soil-derived vapors migrate through building foundations.
	groundwater	ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for drinking water	No	Yes	Quantitative	Currently, there are no groundwater wells at the Site. Potable water is obtained from the City of Cincinnati municipal system. As there is no current prohibition on groundwater use, installation and use of wells could occur in the future.
		incidental ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for purposes other than drinking water	No	Yes	Qualitative	
		inhalation of groundwater-derived vapors in ambient air	Yes	Yes	Inferred from vapor intrusion to indoor air	Potential exposure of routine workers to groundwater vapors in ambient air is possible.
		inhalation of groundwater-derived vapors that migrate through building foundations into indoor air	Yes	Yes	Quantitative	Potential indoor exposure is possible if groundwater-derived vapors migrate through building foundations.
Maintenance Workers	surface and subsurface soil	incidental ingestion of and dermal contact with soil; inhalation of soil-derived vapors and airborne particulates in work-space air	Yes	Yes	Inferred from Routine Workers	Potential exposure to soil in the developed operational area is possible during excavations for utility maintenance.
	groundwater	incidental ingestion of and dermal contact with exposed groundwater; inhalation of vapors from exposed groundwater in work-space air	No	No	Not Applicable	The groundwater table in the developed operational portion of the facility is approximately 50 feet or greater, which is below the depth of the deepest utilities.
Construction Workers	surface and subsurface soil	incidental ingestion of and dermal contact with soil; inhalation of soil-derived vapors and airborne particulates in work-space air	No	Yes	Inferred from Routine Workers	Potential exposure of construction workers to soil may be possible where soil is exposed during any future redevelopment activities.
	groundwater	incidental ingestion of and dermal contact with exposed groundwater; inhalation of vapors from exposed groundwater in work-space air	No	No	Not Applicable	The depth to groundwater in the developed area is approximately 50 feet or greater, which is below a reasonable building foundation depth.
Trespassers	surface soil	incidental ingestion of and dermal contact with surface soil	Yes	Yes	Inferred from Routine Workers	Access to the facility is controlled through fencing, physical constraints and 24 hour security. Potential exposure to surface soil is possible where soil is exposed. Potential exposure to subsurface soil vapors in ambient air is possible.
		inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	Yes	Yes		
	subsurface soil	inhalation of soil-derived vapors in ambient air	Yes	Yes	Not Applicable	
	surface water	incidental ingestion, dermal contact, and inhalation of vapors from wading	Yes	Yes	Quantitative	Potential exposure to surface water and sediment in the historical debris area (AOI C) is possible. Potential exposure to surface water and sediment in the wastewater storage pond (within SWMU 22) is not reasonably expected. On-site surface water is not used for potable or nonpotable purposes.
	sediment	incidental ingestion of and dermal contact with sediment from wading	Yes	Yes	Quantitative	

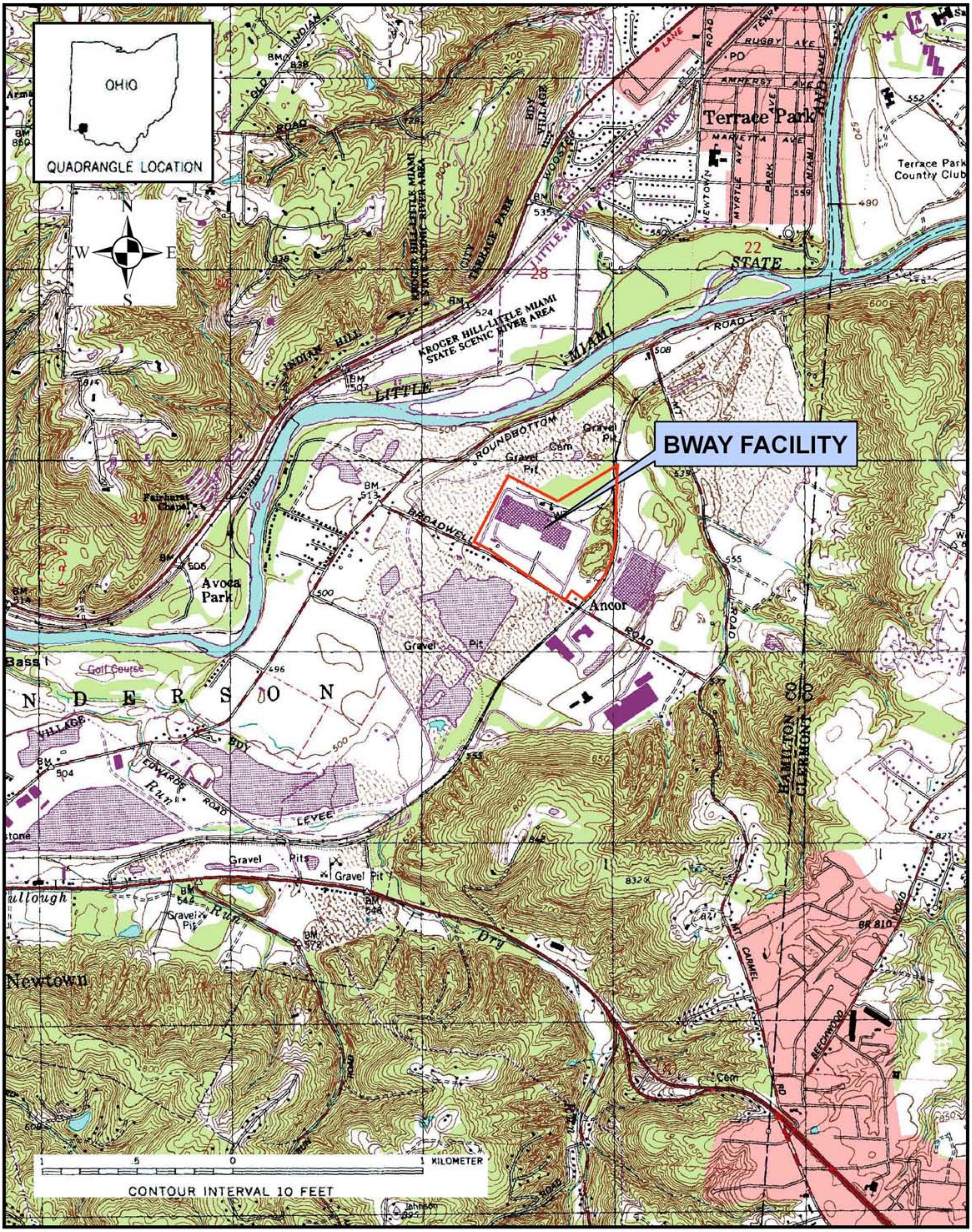
Table 1: Conceptual Site Model for Potential Human Exposures
Bway Corporation, Cincinnati, Ohio

Receptor Population	Exposure Medium	Exposure Route	Possible Currently?	Possible in Future?	Type of Analysis	Comments
Off-Site						
Routine Workers	surface and subsurface soil	inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	Yes	Yes	Inferred from On-Site Routine Workers	The quarry site to the north of the site is currently inactive. There is a current industrial site to the east. There are no current industrial properties to the west. The properties to the south are currently residential. Industrial use of neighboring properties is possible in the future. Airborne exposures off-site are possible via windblown dust from exposed soil or excavation activities at the Site.
	groundwater	ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for drinking water	No	Yes	Quantitative	The results of the well search indicate one well, within the same aquifer system as the Site, may be present in the downgradient direction of the Facility. Currently, there are no industrial properties immediately downgradient. Industrial properties could be constructed in the future.
		incidental ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for purposes other than drinking water	No	Yes	Quantitative	
		inhalation of groundwater-derived vapors in ambient air	No	Yes	Quantitative	Potential exposure of routine workers to groundwater vapors in ambient air is possible in the future.
		inhalation of groundwater-derived vapors that migrate through building foundations into indoor air	No	Yes	Quantitative	Currently, there are no buildings immediately downgradient of the Site. Potential exposure to groundwater-derived vapor migrating to indoor air is possible in the future.
Maintenance Workers	groundwater	incidental ingestion of and dermal contact with exposed groundwater; inhalation of vapors from exposed groundwater in work-space air	Yes	Yes	Quantitative	Potential exposure to groundwater is possible in excavations where groundwater is encountered during utility maintenance.
Residents	surface and subsurface soil	inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	Yes	Yes	Inferred from On-Site Routine Workers	Airborne exposures off-site are possible via windblown dust from exposed soil or excavation activities at the Site.
	groundwater	ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for drinking water	Yes	Yes	Quantitative	The results of the well search indicate one well, within the same aquifer system as the Site, may be present in the downgradient direction of the Facility. Currently, there are no residential properties immediately downgradient.
		incidental ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for purposes other than drinking water	Yes	Yes	Quantitative	
		inhalation of groundwater-derived vapors in ambient air	Yes	Yes	Quantitative	
		inhalation of groundwater-derived vapors that migrate through building foundations into indoor air	Yes	Yes	Quantitative	
Trespassers (to adjacent quarry pond)	surface water	incidental ingestion, dermal contact, and inhalation of vapors from swimming or wading	Yes	Yes	Quantitative	Groundwater and former and current storm sewer water discharges from the Facility to the adjacent quarry pond. Access to the quarry pond is controlled through fencing and physical constraints, however, unauthorized use by trespassers is possible. The pond is not used for potable or nonpotable purposes.
	sediment	incidental ingestion of and dermal contact with sediment from swimming or wading	Yes	Yes	Quantitative	

Table 2: Corrective Measures Objectives Bway Corporation, Cincinnati, Ohio							
Receptor Population	**Exposure Medium**	**Exposure Route**	**Potentially Significant Under Current Conditions?**	**Potentially Significant Under Future Conditions?**	**Description of Potentially Significant Exposure Scenario**	**Corrective Measures Objectives (CMOs)**	**General Corrective Actions (GCAs)**
			On-Site				
Routine Workers	surface soil	incidental ingestion of and dermal contact with surface soil	No	No	Not Significant		
		inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	No	No	Not Significant		
		inhalation of soil-derived vapors that migrate through building foundations into indoor air	No	No	Not Significant		
	subsurface soil	inhalation of soil-derived vapors in ambient air	No	No	Not Significant		
		inhalation of soil-derived vapors that migrate through building foundations into indoor air	No	No	Not Significant		
	groundwater	ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for drinking water	No	Yes	Groundwater concentrations exceed drinking water criteria. Groundwater is currently not used for drinking water at the property, but the potential exists for unacceptable exposures in the future if groundwater exceeding these criteria is used for potable water.	Prevent unacceptable exposures (Pertinent COI > MCL is TCE)	Institutional controls that impose restrictions on future use of groundwater at the Property for potable purposes to prevent potential exposure.
		incidental ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for purposes other than drinking water	No	Yes	Although future nonpotable use is not reasonably expected because the site is expected to continue to be connected to the municipal water supply, such use can not be ruled out. An evaluation of the potential significance of nonpotable groundwater exposures should be evaluated once the specific exposure scenario is known.	Prevent unacceptable exposures (Pertinent COI > MCL is TCE)	Institutional controls that impose restrictions on future use of groundwater at the Property for nonpotable purposes unless it can be demonstrated that there is no unacceptable risks or that risks can be mitigated.
		inhalation of groundwater-derived vapors in ambient air	No	No	Not Significant		
		inhalation of groundwater-derived vapors that migrate through building foundations into indoor air	No	No	Not Significant		
Maintenance Workers	surface and subsurface soil	incidental ingestion of and dermal contact with soil; inhalation of soil-derived vapors and airborne particulates in work-space air	No	No	Not Significant		
	groundwater	incidental ingestion of and dermal contact with exposed groundwater; inhalation of vapors from exposed groundwater in work-space air	No	No	Not Significant		
Construction Workers	surface and subsurface soil	incidental ingestion of and dermal contact with soil; inhalation of soil-derived vapors and airborne particulates in work-space air	No	No	Not Significant		
	groundwater	incidental ingestion of and dermal contact with exposed groundwater; inhalation of vapors from exposed groundwater in work-space air	No	No	Not Significant		
Trespassers	surface soil	incidental ingestion of and dermal contact with surface soil	No	No	Not Significant		
		inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	No	No	Not Significant		
	subsurface soil	inhalation of soil-derived vapors in ambient air	No	No	Not Significant		
	groundwater	inhalation of groundwater-derived vapors in ambient air	No	No	Not Significant		
	surface water	incidental ingestion, dermal contact, and inhalation of vapors from wading	No	No	Not Significant		
	sediment	incidental ingestion of and dermal contact with sediment from wading	No	No	Not Significant		
Ecological	surface soil	ingestion and dermal contact	No	No	Not Significant		
	surface water		No	No	Not Significant		
	sediment		No	No	Not Significant		
	biota tissue	ingestion, food web	No	No	Not Significant		

Table 2: Corrective Measures Objectives Bway Corporation, Cincinnati, Ohio							
Receptor Population	**Exposure Medium**	**Exposure Route**	**Potentially Significant Under Current Conditions?**	**Potentially Significant Under Future Conditions?**	**Description of Potentially Significant Exposure Scenario**	**Corrective Measures Objectives (CMOs)**	**General Corrective Actions (GCAs)**
Off-Site							
Routine Workers	surface and subsurface soil	inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	No	No	Not Significant		
	groundwater	ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for drinking water	No	No	Not Significant		
		incidental ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for purposes other than drinking water	No	No	Not Significant		
		inhalation of groundwater-derived vapors in ambient air	No	No	Not Significant		
		inhalation of groundwater-derived vapors that migrate through building foundations into indoor air	No	No	Not Significant		
Maintenance Workers	groundwater	incidental ingestion of and dermal contact with exposed groundwater; inhalation of vapors from exposed groundwater in work-space air	No	No	Not Significant		
Residents	surface and subsurface soil	inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	No	No	Not Significant		
	groundwater	ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for drinking water	No	No	Not Significant		
		incidental ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for purposes other than drinking water	No	No	Not Significant		
		inhalation of groundwater-derived vapors in ambient air	No	No	Not Significant		
		inhalation of groundwater-derived vapors that migrate through building foundations into indoor air	No	No	Not Significant		
Trespassers (to adjacent quarry pond)	surface water	incidental ingestion, dermal contact, and inhalation of vapors from swimming or wading	No	No	Not Significant		
	sediment	incidental ingestion of and dermal contact with sediment from swimming or wading	No	No	Not Significant		
Ecological	surface soil	ingestion and dermal contact	No	No	Not Significant		
	surface water		No	No	Not Significant		
	sediment		No	No	Not Significant		
	biota tissue	ingestion, food web	No	No	Not Significant		

Figures



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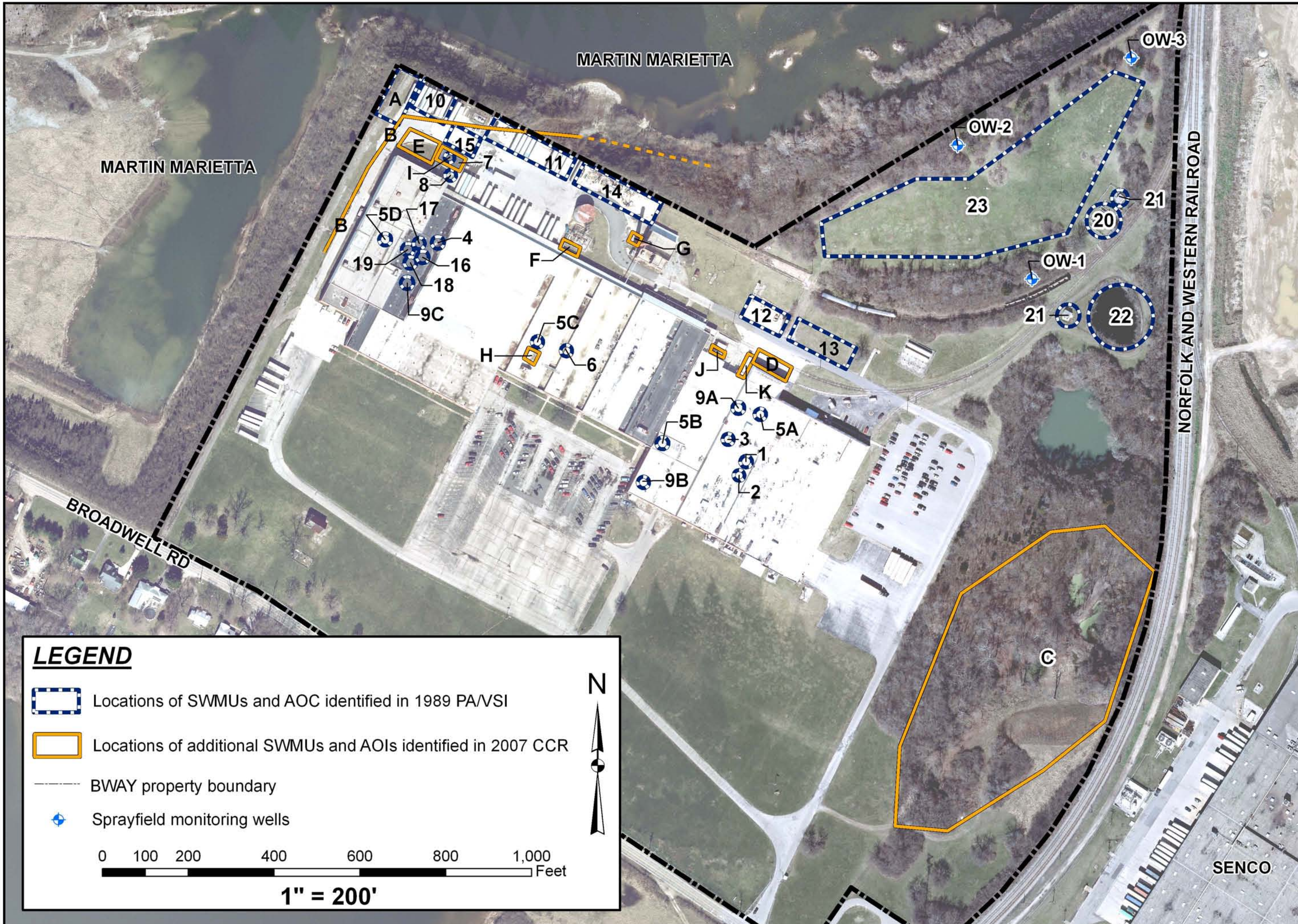
PROJECT BWAY - RCRA Corrective Action	FIGURE NO. 1	DATE 12/17/08	The Payne Firm, Inc. Environmental Consultants Cincinnati, OH / Cleveland, OH Chicago, IL / Troy, NY
TITLE BWAY Facility Location	DRAWN BY JAG	REQUESTED BY KDK	
	PROJECT NO. 654.13.07		

REFERENCE United States Geologic Survey (USGS) 7.5 Minute Quadrangle Map for Maderia, Ohio and Withamsville, Ohio (revised, 1999).



The Payne Firm, Inc.
Environmental Consultants
Cincinnati, OH / Cleveland, OH
Chicago, IL / Troy, NY

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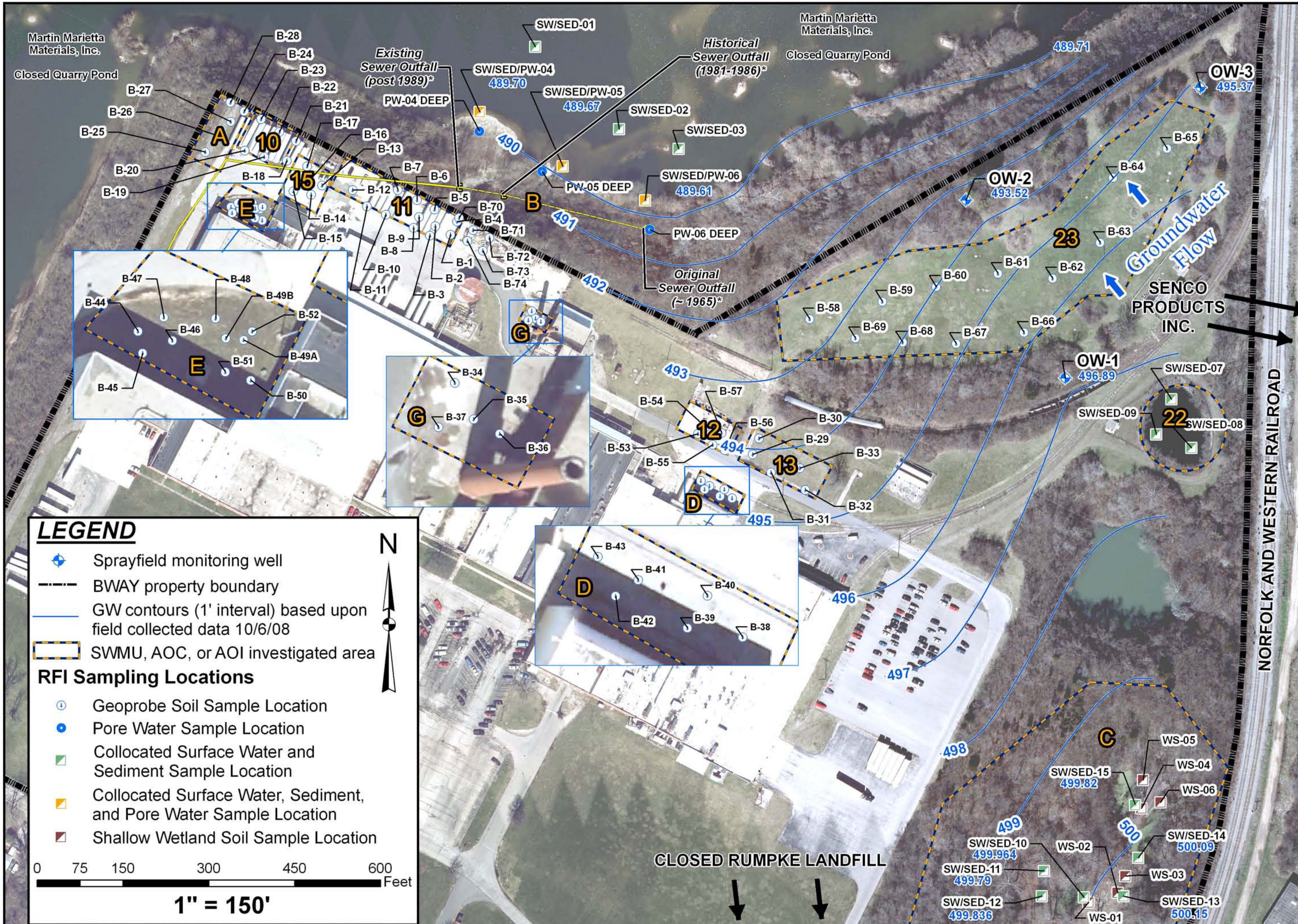
FIGURE NO.	2	DATE	12/17/08
DRAWN BY	JAG	REQUESTED BY	KDK
PROJECT NO.	654.13.07		

PROJECT: BWAY - RCRA Corrective Action

TITLE: Locations of SWMUs, AOCs, and AOIs

REFERENCE: 2006 Orthophoto Courtesy CAGIS; 1989 PA/VSI Exhibits 3 and 4

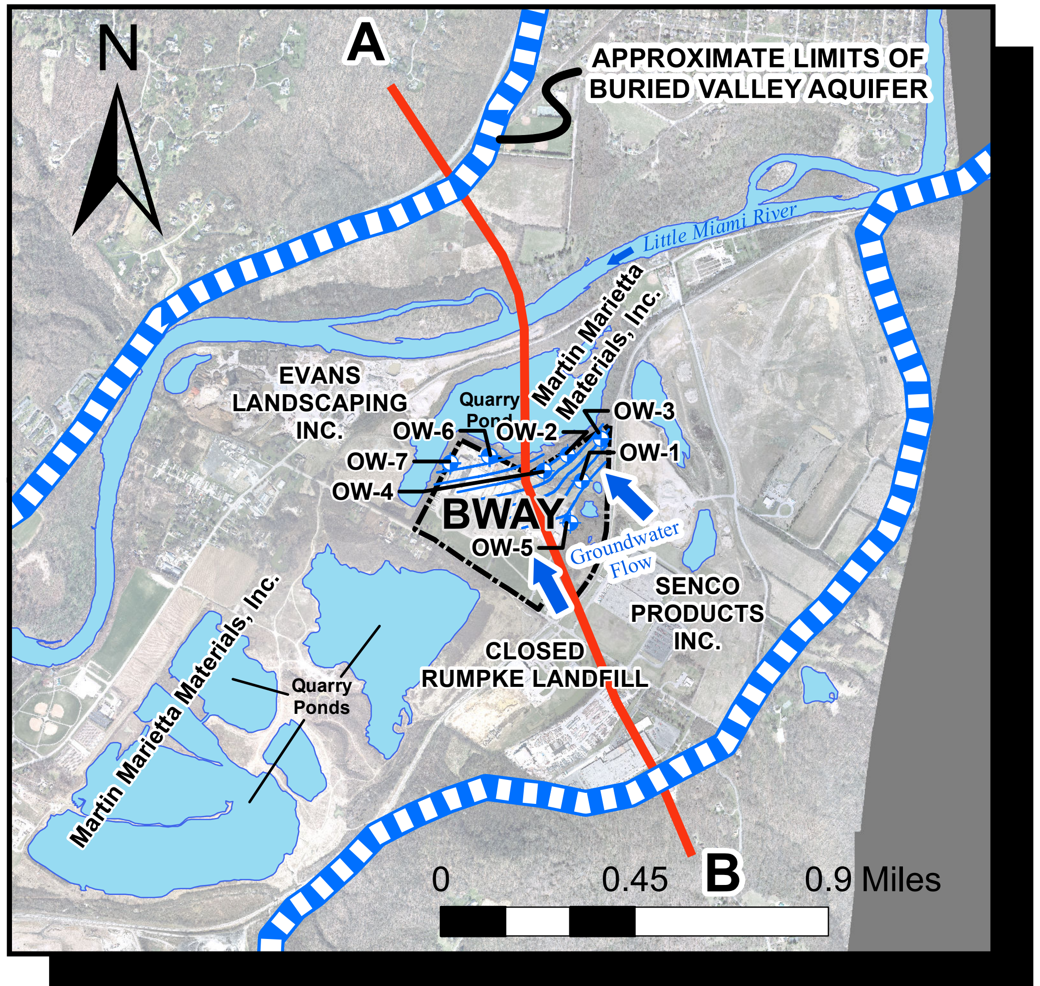


The Payne Firm, Inc.
Environmental Consultants
Cincinnati, OH / Cleveland, OH
Chicago, IL / Troy, NY

FIGURE NO. 3	DATE 12/17/2008
DRAWN BY JAG	REQUESTED BY KDK
PROJECT NO. 654.13.07	

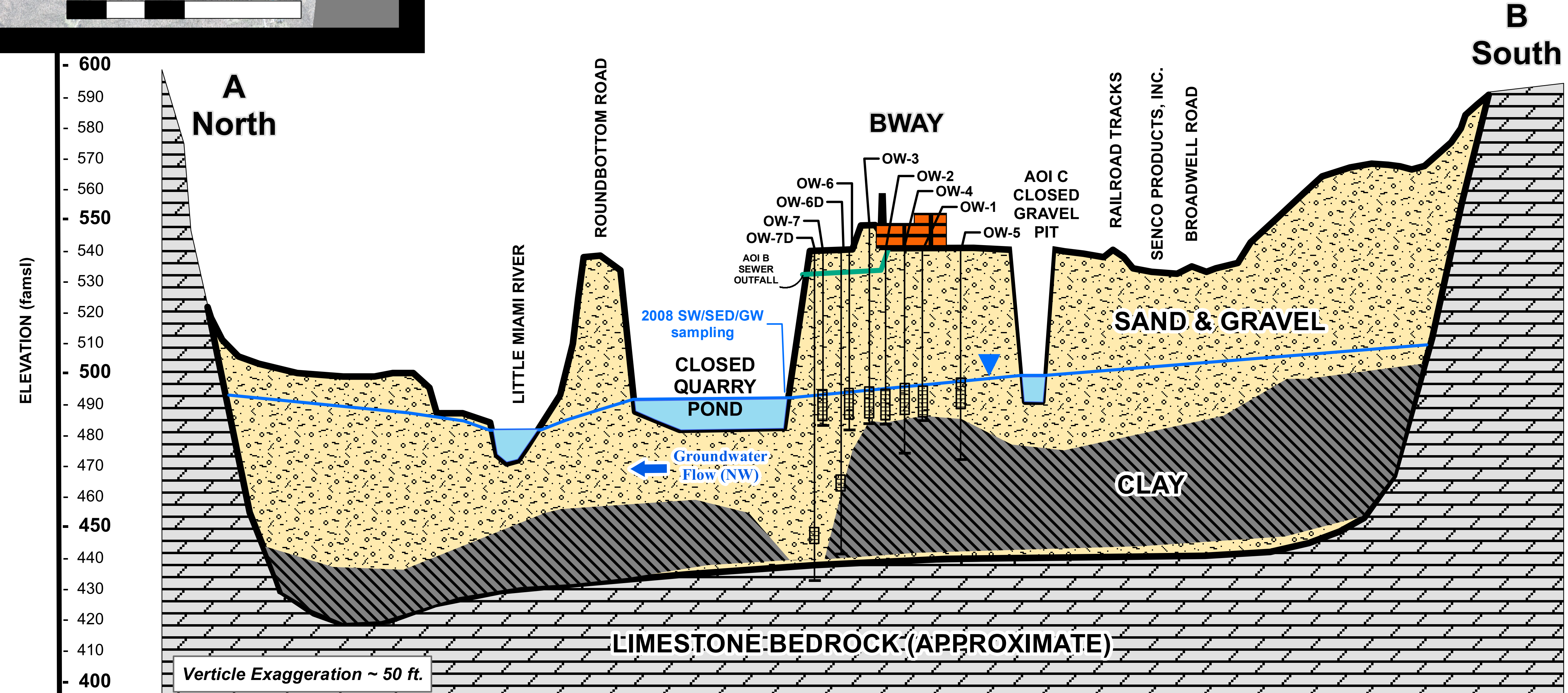
PROJECT BWAY - RCRA Corrective Action

TITLE RFI Sampling Locations and Groundwater Contours



HYDROGEOLOGIC SUMMARY

- The site is underlain by the Little Miami River Buried Valley Aquifer and sits within the Little Miami River Watershed. The Little Miami River flows southwest of the site. Based on maps published by the Ohio EPA, the Facility is not located within a well field protection district.
- The Facility is located over a buried valley which is approximately 100 feet thick and 1 mile wide assigned to a portion of the U.S. EPA designated Greater Miami Sole Source Aquifer system.
- The unconsolidated deposits beneath the facility and in the vicinity of the Property generally consist of about 80 feet of sand and gravel deposits overlying about 30 feet of fine-grained, very-low permeability, glacial tills on top of bedrock.
- The underlying bedrock is composed of interbedded layers of shale and limestone belonging to the Kope Formation of Ordovician Age. The bedrock typically yields less than 5 gallons per minute to drilled wells and is not considered to be a significant aquifer.



modified from 1983 Burgess and Niple Hydrogeologic Investigation Report

G:\GIS_Projects\GIS_0654.13.00_Bway_CA\MXDs\CA750\Figure 4_Cross Section.mxd

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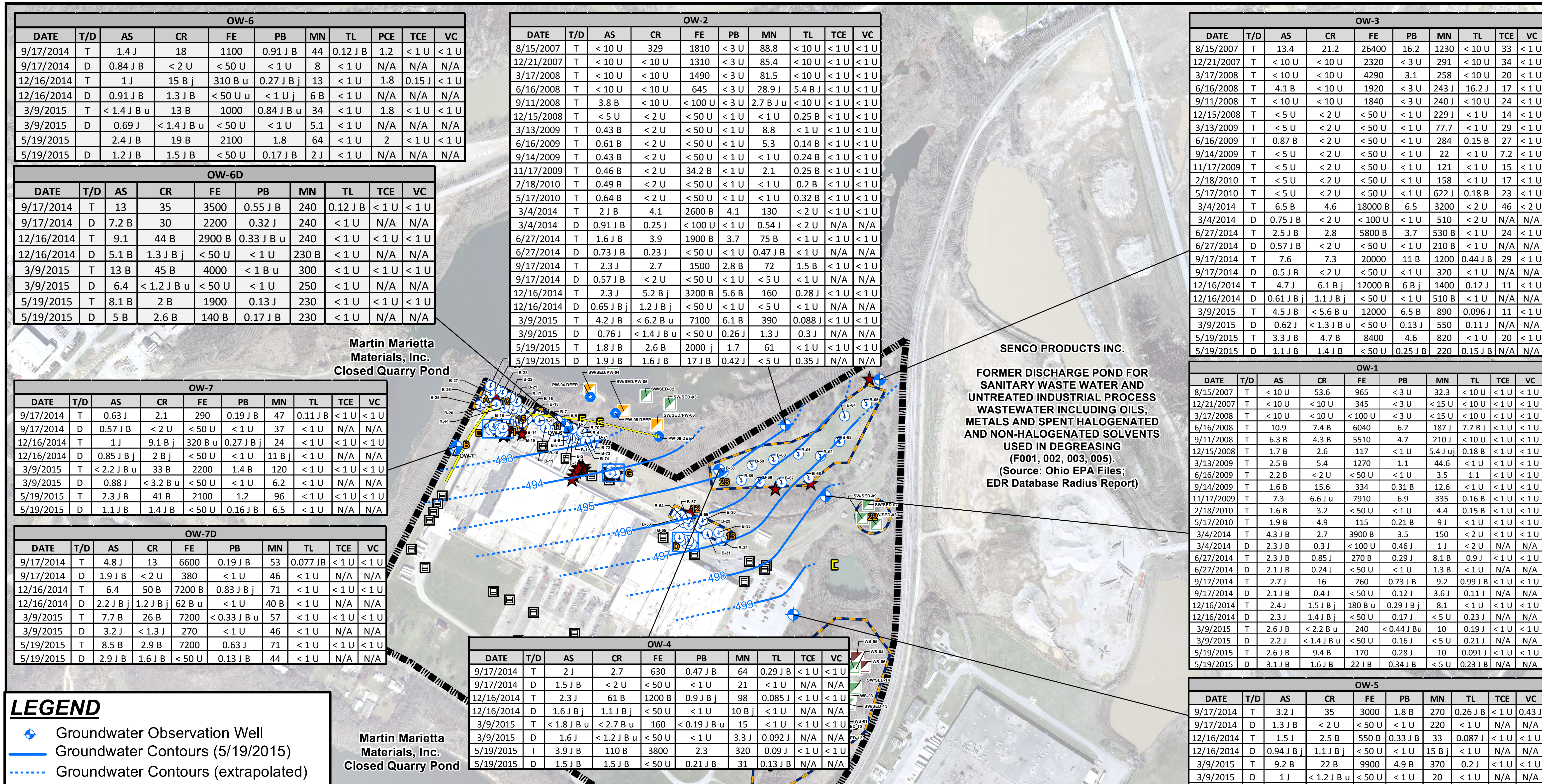
FIGURE NO.	4	DATE	11/18/14
DRAWN BY	JAG/PMR	REQUESTED BY	KDK
PROJECT NO.	214114.0000		

PROJECT BWAY - RCRA Corrective Action

TITLE **Geologic cross-section A to B (updated 2014)**

REFERENCE



OW-6

DATE	T/D	AS	CR	FE	PB	MN	TL	PCE	TCE	VC
9/17/2014	T	1.4 J	18	1100	0.91 J B	44	0.12 J B	1.2	< 1 U	< 1 U
9/17/2014	D	0.84 J B	< 2 U	< 50 U	< 1 U	8	< 1 U	N/A	N/A	N/A
12/16/2014	T	1 J	15 B j	310 B u	0.27 J B j	13	< 1 U	1.8	0.15 J	< 1 U
12/16/2014	D	0.91 J B	1.3 J B	< 50 U u	< 1 U j	6 B	< 1 U	N/A	N/A	N/A
3/9/2015	T	< 1.4 J B u	13 B	1000	0.84 J B u	34	< 1 U	1.8	< 1 U	< 1 U
3/9/2015	D	0.69 J	< 1.4 J B u	< 50 U	< 1 U	5.1	< 1 U	N/A	N/A	N/A
5/19/2015		2.4 J B	19 B	2100	1.8	64	< 1 U	2	< 1 U	< 1 U
5/19/2015	D	1.2 J B	1.5 J B	< 50 U	0.17 J B	2 J	< 1 U	N/A	N/A	N/A

OW-6D

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	13	35	3500	0.55 J B	240	0.12 J B	< 1 U	< 1 U
9/17/2014	D	7.2 B	30	2200	0.32 J	240	< 1 U	N/A	N/A
12/16/2014	T	9.1	44 B	2900 B	0.33 J B u	240	< 1 U	< 1 U	< 1 U
12/16/2014	D	5.1 B	1.3 J B j	< 50 U	< 1 U	230 B	< 1 U	N/A	N/A
3/9/2015	T	13 B	45 B	4000	< 1 B u	300	< 1 U	< 1 U	< 1 U
3/9/2015	D	6.4	< 1.2 J B u	< 50 U	< 1 U	250	< 1 U	N/A	N/A
5/19/2015	T	8.1 B	2 B	1900	0.13 J	230	< 1 U	< 1 U	< 1 U
5/19/2015	D	5 B	2.6 B	140 B	0.17 J B	230	< 1 U	N/A	N/A

OW-7

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	0.63 J	2.1	290	0.19 J B	47	0.11 J B	< 1 U	< 1 U
9/17/2014	D	0.57 J B	< 2 U	< 50 U	< 1 U	37	< 1 U	N/A	N/A
12/16/2014	T	1 J	9.1 B j	320 B u	0.27 J B j	24	< 1 U	< 1 U	< 1 U
12/16/2014	D	0.85 J B j	2 B j	< 50 U	< 1 U	11 B j	< 1 U	N/A	N/A
3/9/2015	T	< 2.2 J B u	33 B	2200	1.4 B	120	< 1 U	< 1 U	< 1 U
3/9/2015	D	0.88 J	< 3.2 B u	< 50 U	< 1 U	6.2	< 1 U	N/A	N/A
5/19/2015	T	2.3 J B	41 B	2100	1.2	96	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.1 J B	1.4 J B	< 50 U	0.16 J B	6.5	< 1 U	N/A	N/A

OW-7D

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	4.8 J	13	6600	0.19 J B	53	0.077 JB	< 1 U	< 1 U
9/17/2014	D	1.9 J B	< 2 U	380	< 1 U	46	< 1 U	N/A	N/A
12/16/2014	T	6.4	50 B	7200 B	0.83 J B j	71	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.2 J B j	1.2 J B j	62 B u	< 1 U	40 B	< 1 U	N/A	N/A
3/9/2015	T	7.7 B	26 B	7200	< 0.33 J B u	57	< 1 U	< 1 U	< 1 U
3/9/2015	D	3.2 J	< 1.3 J	270	< 1 U	46	< 1 U	N/A	N/A
5/19/2015	T	8.5 B	2.9 B	7200	0.63 J	71	< 1 U	< 1 U	< 1 U
5/19/2015	D	2.9 J B	1.6 J B	< 50 U	0.13 J B	44	< 1 U	N/A	N/A

OW-2

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
8/15/2007	T	< 10 U	329	1810	< 3 U	88.8	< 10 U	< 1 U	< 1 U
12/21/2007	T	< 10 U	< 10 U	1310	< 3 U	85.4	< 10 U	< 1 U	< 1 U
3/17/2008	T	< 10 U	< 10 U	1490	< 3 U	81.5	< 10 U	< 1 U	< 1 U
6/16/2008	T	< 10 U	< 10 U	645	< 3 U	28.9 J	5.4 B J	< 1 U	< 1 U
9/11/2008	T	3.8 B	< 10 U	< 100 U	< 3 U	2.7 B J u	< 10 U	< 1 U	< 1 U
12/15/2008	T	< 5 U	< 2 U	< 50 U	< 1 U	< 1 U	0.25 B	< 1 U	< 1 U
3/13/2009	T	0.43 B	< 2 U	< 50 U	< 1 U	8.8	< 1 U	< 1 U	< 1 U
6/16/2009	T	0.61 B	< 2 U	< 50 U	< 1 U	5.3	0.14 B	< 1 U	< 1 U
9/14/2009	T	0.43 B	< 2 U	< 50 U	< 1 U	< 1 U	0.24 B	< 1 U	< 1 U
11/17/2009	T	0.46 B	< 2 U	34.2 B	< 1 U	2.1	0.25 B	< 1 U	< 1 U
2/18/2010	T	0.49 B	< 2 U	< 50 U	< 1 U	< 1 U	0.2 B	< 1 U	< 1 U
5/17/2010	T	0.64 B	< 2 U	< 50 U	< 1 U	< 1 U	0.32 B	< 1 U	< 1 U
3/4/2014	T	2 J B	4.1	2600 B	4.1	130	< 2 U	< 1 U	< 1 U
3/4/2014	D	0.91 J B	0.25 J	< 100 U	< 1 U	0.54 J	< 2 U	N/A	N/A
6/27/2014	T	1.6 J B	3.9	1900 B	3.7	75 B	< 1 U	< 1 U	< 1 U
6/27/2014	D	0.73 J B	0.23 J	< 50 U	< 1 U	0.47 J B	< 1 U	N/A	N/A
9/17/2014	T	2.3 J	2.7	1500	2.8 B	72	1.5 B	< 1 U	< 1 U
9/17/2014	D	0.57 J B	< 2 U	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	5.2 B j	3200 B	5.6 B	160	0.28 J	< 1 U	< 1 U
12/16/2014	D	0.65 J B j	1.2 J B j	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
3/9/2015	T	4.2 J B	< 6.2 B u	7100	6.1 B	390	0.088 J	< 1 U	< 1 U
3/9/2015	D	0.76 J	< 1.4 J B u	< 50 U	0.26 J	1.3 J	0.3 J	N/A	N/A
5/19/2015	T	1.8 J B	2.6 B	2000 j	1.7	61	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.9 J B	1.6 J B	17 J B	0.42 J	< 5 U	0.35 J	N/A	N/A

OW-3

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
8/15/2007	T	13.4	21.2	26400	16.2	1230	< 10 U	33	< 1 U
12/21/2007	T	< 10 U	< 10 U	2320	< 3 U	291	< 10 U	34	< 1 U
3/17/2008	T	< 10 U	< 10 U	4290	3.1	258	< 10 U	20	< 1 U
6/16/2008	T	4.1 B	< 10 U	1920	< 3 U	243 J	16.2 J	17	< 1 U
9/11/2008	T	< 10 U	< 10 U	1840	< 3 U	240 J	< 10 U	24	< 1 U
12/15/2008	T	< 5 U	< 2 U	< 50 U	< 1 U	229 J	< 1 U	14	< 1 U
3/13/2009	T	< 5 U	< 2 U	< 50 U	< 1 U	77.7	< 1 U	29	< 1 U
6/16/2009	T	0.87 B	< 2 U	< 50 U	< 1 U	284	0.15 B	27	< 1 U
9/14/2009	T	< 5 U	< 2 U	< 50 U	< 1 U	22	< 1 U	7.2	< 1 U
11/17/2009	T	< 5 U	< 2 U	< 50 U	< 1 U	121	< 1 U	15	< 1 U
2/18/2010	T	< 5 U	< 2 U	< 50 U	< 1 U	158	< 1 U	17	< 1 U
5/17/2010	T	< 5 U	< 2 U	< 50 U	< 1 U	622 J	0.18 B	23	< 1 U
3/4/2014	T	6.5 B	4.6	18000 B	6.5	3200	< 2 U	46	< 2 U
3/4/2014	D	0.75 J B	< 2 U	< 100 U	< 1 U	510	< 2 U	N/A	N/A
6/27/2014	T	2.5 J B	2.8	5800 B	3.7	530 B	< 1 U	24	< 1 U
6/27/2014	D	0.57 J B	< 2 U	< 50 U	< 1 U	210 B	< 1 U	N/A	N/A
9/17/2014	T	7.6	7.3	20000	11 B	1200	0.44 J B	29	< 1 U
9/17/2014	D	0.5 J B	< 2 U	< 50 U	< 1 U	320	< 1 U	N/A	N/A
12/16/2014	T	4.7 J	6.1 B j	12000 B	6 B j	1400	0.12 J	11	< 1 U
12/16/2014	D	0.61 J B j	1.1 J B j	< 50 U	< 1 U	510 B	< 1 U	N/A	N/A
3/9/2015	T	4.5 J B	< 5.6 B u	12000	6.5 B	890	0.096 J	11	< 1 U
3/9/2015	D	0.62 J	< 1.3 J B u	< 50 U	0.13 J	550	0.11 J	N/A	N/A
5/19/2015	T	3.3 J B	4.7 B	8400	4.6	820	< 1 U	20	< 1 U
5/19/2015	D	1.1 J B	1.4 J B	< 50 U	0.25 J B	220	0.15 J B	N/A	N/A

OW-1

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
8/15/2007	T	< 10 U	53.6	965	< 3 U	32.3	< 10 U	< 1 U	< 1 U
12/21/2007	T	< 10 U	< 10 U	345	< 3 U	< 15 U	< 10 U	< 1 U	< 1 U
3/17/2008	T	< 10 U	< 10 U	< 100 U	< 3 U	< 15 U	< 10 U	< 1 U	< 1 U
6/16/2008	T	10.9	7.4 B	6040	6.2	187 J	7.7 B J	< 1 U	< 1 U
9/11/2008	T	6.3 B	4.3 B	5510	4.7	210 J	< 10 U	< 1 U	< 1 U
12/15/2008	T	1.7 B	2.6	117	< 1 U	5.4 J uj	0.18 B	< 1 U	< 1 U
3/13/2009	T	2.5 B	5.4	1270	1.1	44.6	< 1 U	< 1 U	< 1 U
6/16/2009	T	2.2 B	< 2 U	< 50 U	< 1 U	3.5	1.1	< 1 U	< 1 U
9/14/2009	T	1.6 B	15.6	334	0.31 B	12.6	< 1 U	< 1 U	< 1 U
11/17/2009	T	7.3	6.6 J u	7910	6.9	335	0.16 B	< 1 U	< 1 U
2/18/2010	T	1.6 B	3.2	< 50 U	< 1 U	4.4	0.15 B	< 1 U	< 1 U
5/17/2010	T	1.9 B	4.9	115	0.21 B	9 J	< 1 U	< 1 U	< 1 U
3/4/2014	T	4.3 J B	2.7	3900 B	3.5	150	< 2 U	< 1 U	< 1 U
3/4/2014	D	2.3 J B	0.3 J	< 100 U	0.46 J	1 J	< 2 U	N/A	N/A
6/27/2014	T	2.3 J B	0.85 J	270 B	0.29 J	8.1 B	0.9 J	< 1 U	< 1 U
6/27/2014	D	2.1 J B	0.24 J	< 50 U	< 1 U	1.3 B	< 1 U	N/A	N/A
9/17/2014	T	2.7 J	16	260	0.73 J B	9.2	0.99 J B	< 1 U	< 1 U
9/17/2014	D	2.1 J B	0.4 J	< 50 U	0.12 J	3.6 J	0.11 J	N/A	N/A
12/16/2014	T	2.4 J	1.5 J B j	180 B u	0.29 J B j	8.1	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.3 J	1.4 J B j	< 50 U	0.17 J	< 5 U	0.23 J	N/A	N/A
3/9/2015	T	2.6 J B	< 2.2 B u	240	< 0.44 J Bu	10	0.19 J	< 1 U	< 1 U
3/9/2015	D	2.2 J	< 1.4 J B u	< 50 U	0.16 J	< 5 U	0.21 J	N/A	N/A
5/19/2015	T	2.6 J B	9.4 B	170	0.28 J	10	0.091 J	< 1 U	< 1 U
5/19/2015	D	3.1 J B	1.6 J B	22 J B	0.34 J B	< 5 U	0.23 J B	N/A	N/A

OW-5

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	3.2 J	35	3000	1.8 B	270	0.26 J B	< 1 U	0.43 J
9/17/2014	D	1.3 J B	< 2 U	< 50 U	< 1 U	220	< 1 U	N/A	N/A
12/16/2014	T	1.5 J	2.5 B	550 B	0.33 J B	33	0.087 J	< 1 U	< 1 U
12/16/2014	D	0.94 J B j	1.1 J B j	< 50 U	< 1 U	15 B j	< 1 U	N/A	N/A
3/9/2015	T	9.2 B	22 B	9900	4.9 B	370	0.2 J	< 1 U	< 1 U
3/9/2015	D	1 J	< 1.2 J B u	< 50 U	< 1 U	20	< 1 U	N/A	N/A
5/19/2015	T	1.9 J B	3 B	940	0.6 J	23	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.4 J B	1.4 J B	< 50 U	0.22 J B	1.2 J	0.14 J B	N/A	N/A

OW-4

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2 J	2.7	630	0.47 J B	64	0.29 J B	< 1 U	< 1 U
9/17/2014	D	1.5 J B	< 2 U	< 50 U	< 1 U	21	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	61 B	1200 B	0.9 J B j	98	0.085 J	< 1 U	< 1 U
12/16/2014	D	1.6 J B j	1.1 J B j	< 50 U	< 1 U	10 B j	< 1 U	N/A	N/A
3/9/2015	T	< 1.8 J B u	< 2.7 B u	160	< 0.19 J B u	15	< 1 U	< 1 U	< 1 U
3/9/2015	D	1.6 J	< 1.2 J B u	< 50 U	< 1 U	3.3 J	0.092 J	N/A	N/A
5/19/2015	T	3.9 J B	110 B	3800	2.3	320	0.09 J	< 1 U	< 1 U
5/19/2015	D	1.5 J B	1.5 J B	< 50 U	0.21 J B	31	0.13 J B	N/A	N/A

LEGEND

- Groundwater Observation Well
- Groundwater Contours (5/19/2015)
- Groundwater Contours (extrapolated)
- BWAY Property Boundary
- 2 FT Ground Surface Contours
- SWMU, AOC, or AOI investigated area

RFI Sampling Locations

- Geoprobe Soil Sample Location
- Pore Water Sample Location
- Collocated Surface Water and Sediment Sample Location
- Collocated Surface Water, Sediment, and Pore Water Sample Location
- Shallow Wetland Soil Sample Location

N

0 200 400
Feet

legal
shown

Notes

All samples reported in UG/L (micrograms per liter); QA/QC Duplicate samples not shown on figure.

AS = Arsenic; CR = Chromium; FE = Iron; PB = Lead; MN = Manganese; TL = Thallium; TCE = Trichloroethene; VC = Vinyl Chloride; PCE = Tetrachlorethene

RSL: USEPA Regional Screening Levels, November 2015 (Iron RSL = 15,000) (Manganese RSL = 480)

MCL: Maximum Contaminant Level enforceable standard of National Primary Drinking Water Regulations under Safe Drinking Water Act

(Arsenic MCL = **10**) (Chromium MCL = **100**) (Lead MCL = **15**) (Thallium MCL = **2**) (TCE MCL = **5**) (Vinyl Chloride MCL = **2**)

T/D: measured basis (metals only); T = total, D = dissolved

N/A: Not Analyzed

U: Test America Lab Qualifier. Nondetect.

J: Test America Lab Qualifier. Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B: Test America Lab Qualifier. Estimated result. Result is less than the reporting limit.

j: TRC Qualifier. The analyte was not detected above the reporting sample quantitation limit. However, the reported quantitation limit is approx. and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

u: TRC Qualifier. The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

TITLE
GROUNDWATER SAMPLE LOCATIONS & RESULTS SINCE 2007

PROJECT
BWAY RCRA CORRECTIVE ACTION (RCRA-05-2007-0011)

DATE
Monday, December 19, 2016

FIGURE
5

PROJECT NUMBER
214114

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GIS

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Appendix I

Sampling and Analysis Plans

Appendix I
RFI Sampling and Analysis Plans

SAP 1	Former Process Wastewater Sewer (AOI B) Investigation and Former Scrap Building Underground Storage Tank (AOI I) Integrity Test
SAP 2	Direct Push Soil Investigation
SAP 3	Surface Water, Sediment, Sediment Pore Water, and Shallow Soil Investigation
SAP 4	Supplemental RFI Groundwater Investigation

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The Payne Firm, Inc.
Environmental Consultants

STATEMENT OF WORK #1

DATE:	June 11, 2008
SUBJECT:	Former Process Wastewater Sewer (AOI B) Investigation and Former Scrap Building Underground Storage Tank (AOI I) Integrity Test
PROJECT NO.:	0654.13.05

---

1. OBJECTIVES

This Statement of Work (SOW) identifies the first field task that will be undertaken as part of a September 13, 2007 Administrative Order of Consent (Order) between the United States Environmental Protection Agency (U.S. EPA) Region 5 and Bway.

This SOW involves two Areas of Interest (AOI) identified in the November 8, 2007 Current Conditions Report (CCR) recommended for further investigation: 1) a former process wastewater sewer line (AOI B) originating from the former process wastewater treatment area in the D&I building to the outfall location extending into the gravel pit adjacent to the property to the north; and 2) a 300-gallon fiberglass underground storage tank (UST) (AOI I) located in the former aluminum scrap handling building addition at the northwest corner of the facility.

2. FORMER PROCESS WASTEWATER SEWER LINE (AOI B)

A December 3, 1997 Baseline Environmental Assessment conducted by The Payne Firm, Inc. (Payne Firm) included a sewer line assessment that provided the basis for the understanding of the nature and anticipated flow paths for the former process sewer line. As described in Section 5.25.1 of the CCR, the 1997 sewer line investigation identified a 6-inch clay tile sewer line inlet observed to be pitted and eroded (Figure 1) at a manhole location along the storm sewer line running along and parallel to the western end of the facility. The inlet was observed to originate from the east in the general direction of the former wastewater treatment area of the D&I building. It is suggested that this inlet at the 15-inch concrete storm sewer was the discharge point for process wastewater originating from the former treatment unit in the D&I building.

The configuration of the former treatment unit is sketched in Figure 4-1 of the May 1986 (revised September 1986) Closure Plan for the Wastewater Treatment Unit and is included as Figure 2 of this SOW. Although the treatment unit no longer exists at the facility (the area is currently used for warehousing), concrete floor cuts are visible and may outline the prior configuration, potentially aiding in the understanding of the origination point of the process sewer line.

Investigation of the former process sewer line is intended to accomplish three primary goals: 1) confirm the origination of the suggested process sewer line at the former D&I building;

2) confirm the ultimate discharge point for the sewer line outfall beyond the northern property line at the gravel pit; and 3) identify locations along the sewer line where corrosion or cracks exists that represent a compromise of the pipe integrity allowing for a potential release to subsurface. Identification of any pipe defects will be used for targeted soil sampling in SOW 2 soil investigation. Figure 3 illustrates the entire facility sewer network and isolates the sewer segments targeted for this investigation.

A private utility locating service will be contracted to trace the sewer line using down-hole video surveillance equipment. The point of departure for accomplishing the stated goals above will be the storm sewer manhole location west of the facility that was identified and photographed in the 1997 sewer line investigation (Figure 1). The manhole will be opened and the video surveillance line will be run upstream (east) through the inlet of the 6-inch pipe towards the facility. To the extent possible, the equipment will video record the length of the sewer to its origination point. If the origination point cannot be opened or accessed from within the facility, total length will be recorded to approximately locate position. The origination point will then be matched to the former treatment unit configuration, if possible.

During the advancement of the surveillance equipment, pipe defects will be noted, recorded and measured by distance from the point of departure. After advancing the surveillance equipment upstream from the inlet point, the equipment will be retrieved and cleaned. The down-hole video surveillance equipment will then be advanced from the same point of departure downstream (north) through the 15-inch concrete storm sewer to its ultimate discharge point. Pipe defects again will be noted, recorded and measured from the point of departure, and flagged for potential future subsurface investigation in SOW #2.

3. FORMER SCRAP HANDLING BUILDING UST (AOI I)

As described in Section 5.32.1 of the CCR, the former aluminum scrap handling building addition houses a 300-gallon fiberglass UST that has been reportedly emptied, cleaned, and never closed. An attached sump has reportedly been filled with concrete. Since the tank's age and past contents and uses cannot be fully documented, a tank integrity test was recommended to determine the release potential of this tank to the subsurface.

A certified tank-test contractor will be retained to conduct a tank integrity assessment using two tests. First, a wet test will be conducted to confirm that the tank is empty, or to document the liquid volume of any remnant material within the tank if contents are found. Second, an ullage test will determine the integrity of the tank and associated system (fill ports, vents, etc.) to document whether this tank potentially may have released contents to the subsurface.

4. FIELD DOCUMENTATION

A field logbook will be used to record facts and circumstances of the investigations. Information recorded in the logbook/field form will include the following:

- Name of field personnel and contractors;
- Time and date;
- Weather conditions;
- Measurements and calculations; and
- Pertinent observations.

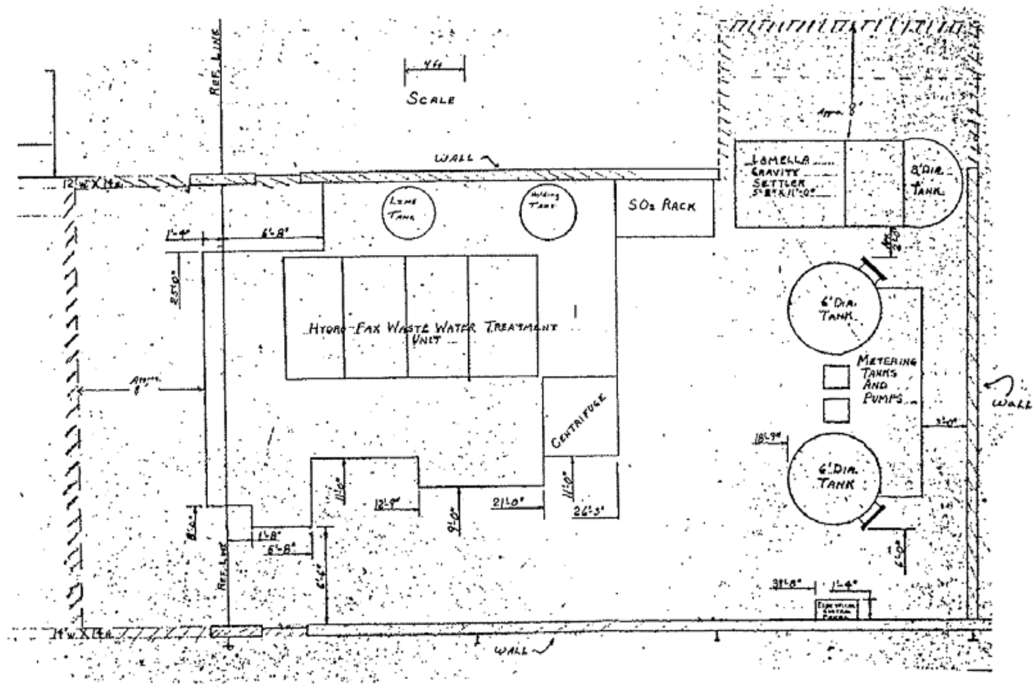
Figure 1. Suggested 6-inch former process waste sewer line inlet to 15-inch storm sewer. (From Appendix I – Baseline Assessment Site Inspection Photographs, Baseline Environmental Assessment, Payne Firm, 1997).

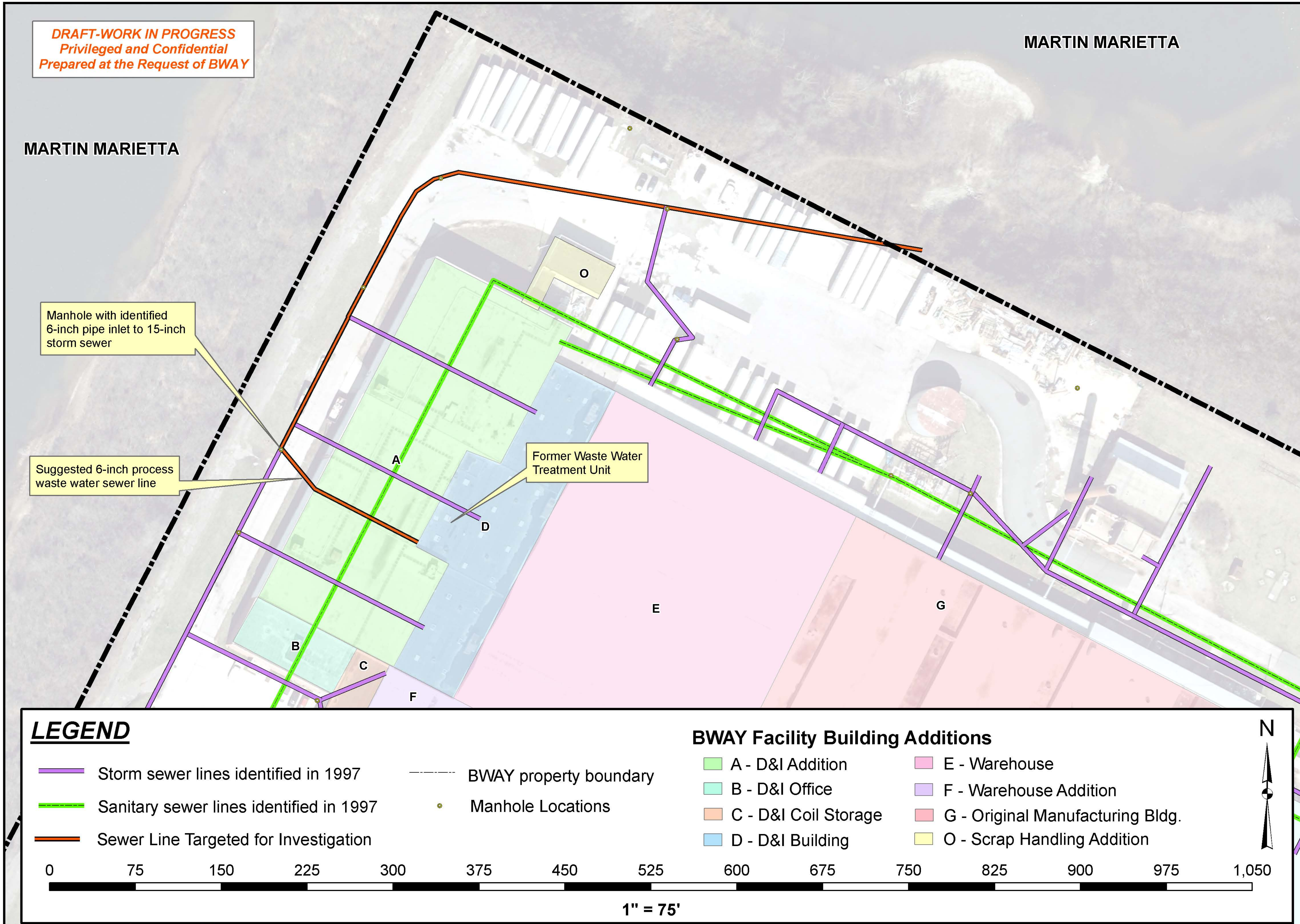
Figure 2. Sketch of configuration of former wastewater treatment unit in D&I building addition. [From Figure 4-1 of the Closure Plan for the Wastewater Treatment Unit, Heekin Can Inc., May 1986 (revised September 1986)].

Figure 4-1 Sketch of Waste Water Treatment Unit

and Associated Equipment

(Hash marks delineate boundary of area to be washed and rinsed).





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PROJECT	BWAY - RCRA Corrective Action
TITLE	SOW #1 - Former Process Waste Water Sewer Line (AOI B) Investigation
FIGURE NO.	3
DATE	6/10/08
DRAWN BY	MDB
REQUESTED BY	KDK
PROJECT NO.	654.13.02
REFERENCE	2006 Orthophoto Courtesy CAGIS; 1998 Payne Firm Baseline Environmental Assessment (BEA) Appendix III: Summary of Sewer Network

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SAMPLING & ANALYSIS PLAN #2

The Payne Firm, Inc.
Environmental Consultants

DATE: June 16, 2008

SUBJECT: Direct Push Soil Investigation

PROJECT NO.: 0654.13.05

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1. OBJECTIVES

This Sampling & Analysis Plan (SAP) outlines the direct-push soil sampling tasks that will be undertaken as part of a September 13, 2007 Administrative Order of Consent (Order) between the United States Environmental Protection Agency (U.S. EPA) Region 5 and Bway.

The purpose of the sampling event is to determine the concentrations of potential chemicals of concern (COCs) within the soil beneath designated Solid Waste Management Units (SWMUs) and at the property line. This event can be considered a screening evaluation to determine potential impact to groundwater. Decisions regarding the need for further investigation will be made based on professional judgment considering the screening results and results of a qualitative data review, including the magnitude of the concentrations, their spatial distribution, and other factors (e.g., background levels).

Specific objectives of the scope of work include:

- □ Soil source characterization at six outdoor former drum storage areas;
- □ Soil source characterization at four former underground storage tank (UST) areas; and
- □ Soil source characterization along the former process wastewater sewer line.

2. WORK TO BE COMPLETED

A. Direct-Push Soil Sampling at the Former Drum Storage Areas

Soil samples will be collected from the unsaturated zone in the vicinity of six former outdoor drum storage areas (Figure SOW 2A) to determine whether or not a soil source area of hazardous substances exists on the facility. These soil samples will be analyzed for VOCs, SVOCs, and TAL Metals in accordance with the methods outlined in the Quality Assurance Project Plan (QAPP) dated June 11, 2008. This investigation will concentrate on soil sampling above the water table utilizing a direct-push Geoprobe® rig to complete borings into the unsaturated zone and will be logged by a Payne Firm geologist. Samples will be submitted to a laboratory from three discrete 2-foot intervals at each boring location. Headspace screening results and field observations such as staining, discoloration and/or odor will be recorded across the entire boring. A surficial interval will be sampled, and one sampling interval will be dependent on the highest headspace screening results and/or field observations. A third sample will be submitted from the bottom of the boring, which will be terminated based on field observations of the absence of apparent contamination. Table 1 outlines sampling methodology at each sampling location. All borings will be abandoned to the ground surface in accordance with state guidelines.

Soil samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested. Upon completion, a licensed surveyor will locate the coordinates and elevations of the direct-push borings.

B. Direct-Push Soil Sampling at the Former UST locations

Soil samples will be collected from the unsaturated zone in the vicinity of four former UST areas (Figure SOW 2B) to determine whether or not a soil source area of hazardous substances exists on the facility. These soil samples will be analyzed for VOCs, SVOCs, and TAL Metals in accordance with the QAPP. This investigation will concentrate on soil sampling above the water table utilizing a direct-push Geoprobe® rig to complete borings into the unsaturated zone and will be logged by a Payne Firm geologist. Samples will be submitted to a laboratory from three intervals at each boring location. Headspace screening results and field observations will be recorded across the entire boring. One sample interval will be submitted from the base of the known bottom depth of the invert of the former USTs at each location, and one sampling interval will be dependent on the highest headspace screening results and/or field observations. A third sample will be submitted from the bottom of the boring, which will be terminated based on field observations of the absence of apparent contamination. Table 1 outlines sampling methodology at each sampling location. All borings will be abandoned to the ground surface in accordance with state guidelines.

Soil samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested. Upon completion, a licensed surveyor will locate the coordinates and elevations of the direct-push borings.

C. Direct-Push Soil Sampling along the former process wastewater sewer line

Soil samples will be collected from the unsaturated zone along the length of the former process wastewater sewer line as determined from the results of SOW 1: Former Process Wastewater Sewer (AOI B) Investigation. One of the primary goals of this investigation is to identify locations along the sewer line where corrosion or cracks exists that represent a compromise of the pipe integrity allowing for a potential release to the subsurface. If identified, these locations will be flagged for boring locations. Soil samples taken from any of these boring locations will be analyzed for VOCs, SVOCs, and TAL Metals in accordance with the QAPP. This investigation will concentrate on soil sampling above the water table utilizing a direct-push Geoprobe® rig to complete borings into the unsaturated zone and will be logged by a Payne Firm geologist. Samples will be submitted to a laboratory from three intervals at each boring location. Headspace screening results will be recorded across the entire boring. One sample interval will be submitted from the base of the known bottom depth of the sewer line invert at each location, and one sampling interval will be dependent on the highest headspace screening results and/or field observations. A third sample will be submitted from the bottom of the boring, which will be terminated based on field observations of the absence of apparent contamination. Table 1 outlines sampling methodology at each sampling location. All borings will be abandoned to the ground surface in accordance with state guidelines.

Soil samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested. Upon completion, a licensed surveyor will locate the coordinates and elevations of the direct-push borings.

3. DIRECT-PUSH PROFILE SAMPLING METHODOLOGY

The field activities associated with ground water monitoring will follow the Payne Firm's Standard Operating Procedures (SOPs) for Borehole Drilling, Field Screening, and Borehole Abandonment as provided in the QAPP. The borings will be installed using direct-push technology. A sampling device will be used to collect several soil samples from different depths throughout the unsaturated zone.

The methodology will consist of the following primary elements:

- All soil borings should be logged during this sampling event to obtain an understanding of the geologic materials.
- Nearby monitoring wells should be used for water level measurements to obtain an understanding of the water level table beneath the surface prior to starting.
- Upon completion of the sampling and removal of the drilling rods, the boring will be backfilled with bentonite chips and the surface location patched following the procedures and criteria presented in SOP 3-6 (Borehole Abandonment).
- The direct-push stainless steel screen and other drilling rods will be decontaminated in accordance with the Payne Firm SOPs 5-1 (Decontamination of Soil Sampling Equipment)
- During the sampling, observations should be made to determine if any LNAPL or DNAPL is present.
- Soil sampling information will be recorded in the project field logbook.

4. SAMPLING CONTAINERS, IDENTIFICATION, ANALYSIS AND PRESERVATION

The soil samples will be labeled as GP-01/02-04/ [date], where:

GP-01/02-04/ [date],	Location identification;
GP-01/02-04/ [date],	Interval of sample in feet below ground surface;
GP-01/02-04/ [date],	Date of Sample Collection.

Soil and ground water samples will be analyzed to meet the regulated thresholds in compliance with USEPA. The attached tables list the appropriate analytical methods, sample containers, holding times and preservatives for the constituents of interest.

5. SAMPLE HANDLING AND SHIPMENT

Soil and ground water samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested. Samples will be shipped to and analyzed by the project laboratory, as discussed above.

6. FIELD DOCUMENTATION

6.1 Field Logbook

A field logbook will be used to record facts and circumstances of the sampling event. Information recorded in the logbook/field form will include the following:

- Name of sampling personnel;
- Sample location;
- Time and date;
- Weather conditions;
- Sample type (i.e. grab, composite, etc.); and
- Pertinent sample data.

6.2 Chain-of-Custody

Chain-of-custody documentation will accompany each sample shipment. The chain-of-custody record will record the project name, type of sample collected, date of sample collection, name(s) of the person(s) responsible for sample collection, date of custody transfer, signature of the person relinquishing and accepting sample custody, and other pertinent information.

7. EQUIPMENT DECONTAMINATION

Decontamination procedures include:

- The direct-push stainless steel screen and other drilling rods will be decontaminated in accordance with the Payne Firm SOPs 5-1 (Decontamination of Soil Sampling Equipment);
- Field Equipment coming into contact with contaminated materials:
  - Scrub the exterior (and interior if necessary) of the equipment (Bucket #1);
  - Scrub and Rinse thoroughly with potable water (Bucket #2);
  - Rinse thoroughly with distilled water;
  - Allow to air dry;
  - If oil or notable contamination is present, the field coordinator should determine if additional decontamination methods are necessary (such as alcohol wash).

Decontamination solutions will be contained and new solutions used periodically during each day of sampling. All decontamination solutions will be contained and properly disposed.

8. QUALITY ASSURANCE

Sample collection, quality assurance/quality control procedures, and employment of data quality objectives will be conducted by the Payne Firm in accordance with the Payne Firm's SOPs. During the monitoring event, the following QA/QC samples will be collected at a minimum:

The general level of the QC effort will consist of one field duplicate, one field equipment rinseate, and one field blank per 20 investigative samples. One VOC trip blank sample will be prepared by the laboratory and will be included along with each shipment of aqueous VOC samples. VOC trip blanks will be preserved by the laboratory in the same manner as the investigative samples.

MS/MSD samples are investigative samples. MS/MSD water samples must be collected at triple volume for VOC and double the volume for extractable organics. No additional volume is required for solid samples.

- The trip blank samples will be identified as: TB01/ [date]. The trip blank sample will be analyzed for VOCs.
- The duplicate samples will be collected at the discretion of the field coordinator. The duplicate samples will be identified successively as: DUP01/ [date], DUP02/ [date], etc. The duplicate sample will be analyzed for the same parameters as the original sample.
- The rinse water sample will be collected after the ground water sample equipment has been properly decontaminated at the end of the day. The sample will be collected by pouring laboratory grade water over the equipment, and collecting the rinse water off of the pump into the appropriate sample containers. The laboratory grade water will be provided by the project laboratory. The rinse water sample will be labeled as: RIN01/ [date]. This QA/QC sample will be analyzed for VOCs, SVOCs and metals.
- The field blank sample will be collected by filling laboratory grade water directly into the appropriate sample containers. The field blank sample will be labeled as FB01/ [date]. The field blank sample location should be noted in the field notes. This QA/QC sample will be analyzed for VOCs.
- At the beginning of each day, the organic vapor analyzer and the water quality meter will be calibrated. Calibration results will be documented in the log book.

9. SAMPLING TEAM

Project Manager-Kevin D. Kallini, P.G.
Field Coordinator/Quality Assurance Officer-Matthew D. Birck
Field Samplers-Payne Firm field personnel

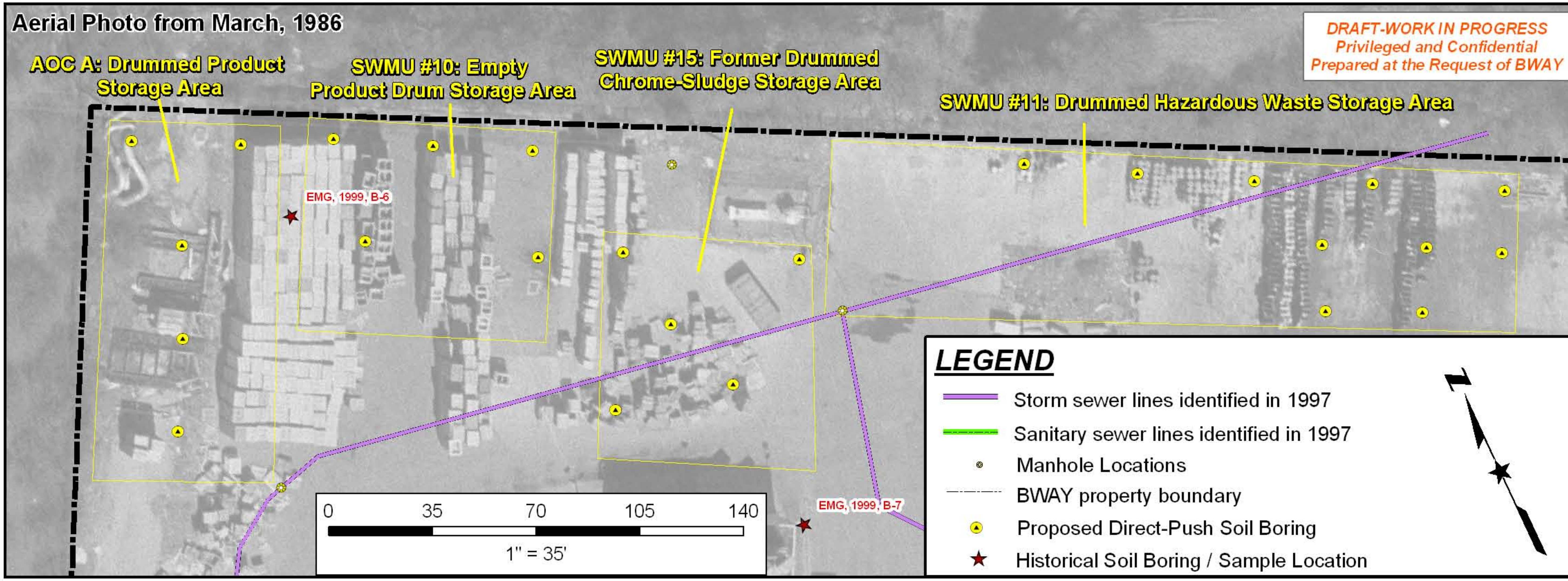
The Payne Firm, Inc.

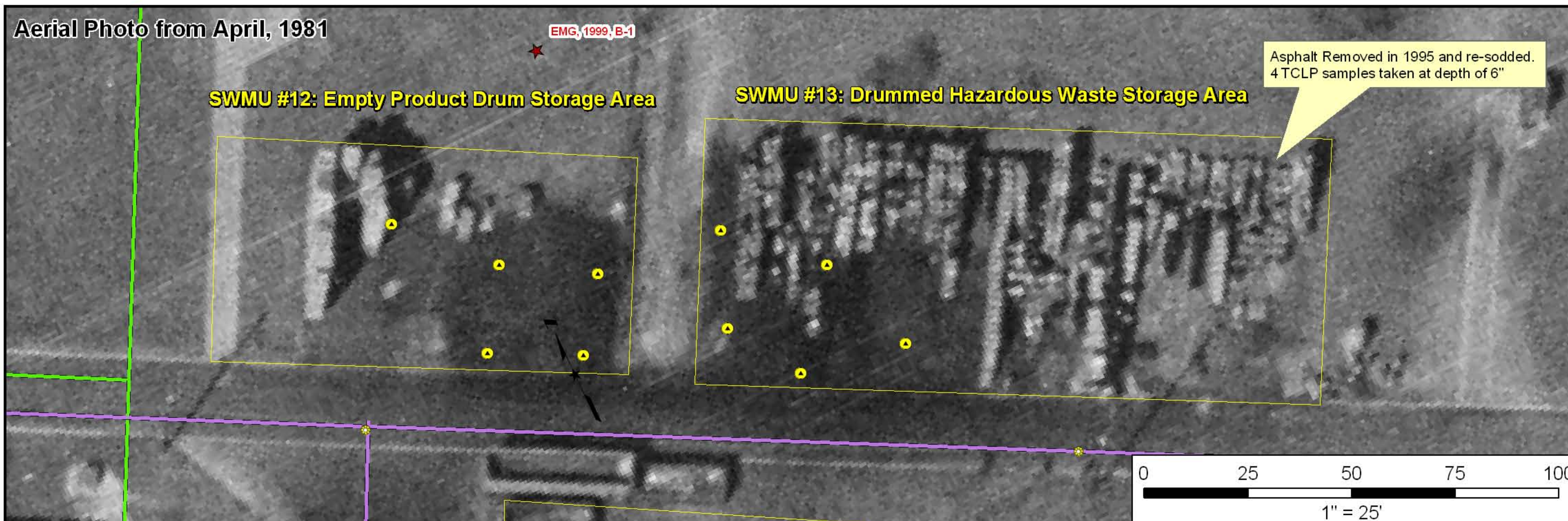
Bway Corporation

Cincinnati, Ohio OHD 004 253 225
RCRA 3008(h) Consent Order RCRA-05-2007-0011
Project No. 0654.13.05

TABLE 1: Geoprobe Soil Sampling Methodology

Focus Area	SWMU, AOC, or AOI	Scope	Sample Determination Criteria	Purpose	Rationale
Former Outdoor Drum Storage Areas	SWMU 10 - #1 empty product drum storage area	5 borings, 15 samples (VOC, SVOC, Metals)	1 - Surficial Interval; 2 - Determination based upon field-screening results; 3 - bottom of interval	Characterize potential release to subsurface and determine potential impact to groundwater	per Recommendations in CCR Section 5
	SWMU 11 - #1 drummed hazardous waste storage area	10 borings, 30 samples (VOC, SVOC, Metals)			
	SWMU 12 - #2 empty product drum storage area	5 borings, 15 samples (VOC, SVOC, Metals)			
	SWMU 13 - #2 drummed hazardous waste storage area	5 borings, 15 samples (VOC, SVOC, Metals)			
	SWMU 15 - Former drummed chrome-sludge storage area	5 borings, 15 samples (VOC, SVOC, Metals)			
	AOC A - Drummed product storage area	5 borings, 15 samples (VOC, SVOC, Metals)			
Former UST areas	AOI D - Former Plant 9 USTs (5)	5 borings, 15 samples (VOC, SVOC, Metals)	1 - Interval from depths of former tanks soil-gas investigations (3' and 5.5'); 2 - Determination based upon field-screening results; 3 - bottom of interval	Characterize potential release to subsurface and determine potential impact to groundwater	per Recommendations in CCR Section 5
	AOI E - Former D&I USTs (5)	5 borings, 15 samples (VOC, SVOC, Metals)	1 - Interval from bottom of former tank excavated areas (Tanks 1-3: 12'; Tanks 4-5: 11'); 2 - Determination based upon field-screening results; 3 - bottom of interval	Characterize potential release to subsurface and determine potential impact to groundwater	per Recommendations in CCR Section 5
	AOI G - Former fuel oil UST	3 borings, 9 samples (VOC, SVOC, Metals)	1 - Interval from bottom of former tank excavated areas (7') and pump pad / pipe (1.5'); 2 - Determination based upon field-screening results; 3 - bottom of interval	Characterize potential release to subsurface and determine potential impact to groundwater	per Recommendations in CCR Section 5
	AOI I - Former scrap bldg UST	3 borings, 9 samples (VOC, SVOC, Metals)	1 - Interval from depth of tank bottom (TBD); 2 - Determination based upon field-screening results; 3 - bottom of interval	Characterize potential release to subsurface and determine potential impact to groundwater	per Recommendations in CCR Section 5 - dependent upon SOW #1 results
Former Process Sewer Line	AOI B - Former Process Sewer Line	5 borings, 15 samples (VOC, SVOC, Metals)	1 - Interval from depth of pipe bottom (TBD); 2 - Determination based upon field-screening results; 3 - bottom of interval	Characterize potential release to subsurface and determine potential impact to groundwater	per Recommendations in CCR Section 5 - dependent upon SOW #1 results





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DATE	6/10/08
REQUESTED BY	KDK
FIGURE NO.	SOW 2A
DRAWN BY	MDB
PROJECT NO.	654.13.01
PROJECT	BWAY - RCRA Corrective Action
TITLE	SOW #2 - Former Drummed Storage Area Soil Investigation (SWMUs 10, 11,12, 13, 15, and AOC A)
REFERENCE	1981 and 1986 Orthophotos Courtesy ODOT, Office of Aerial Engineering

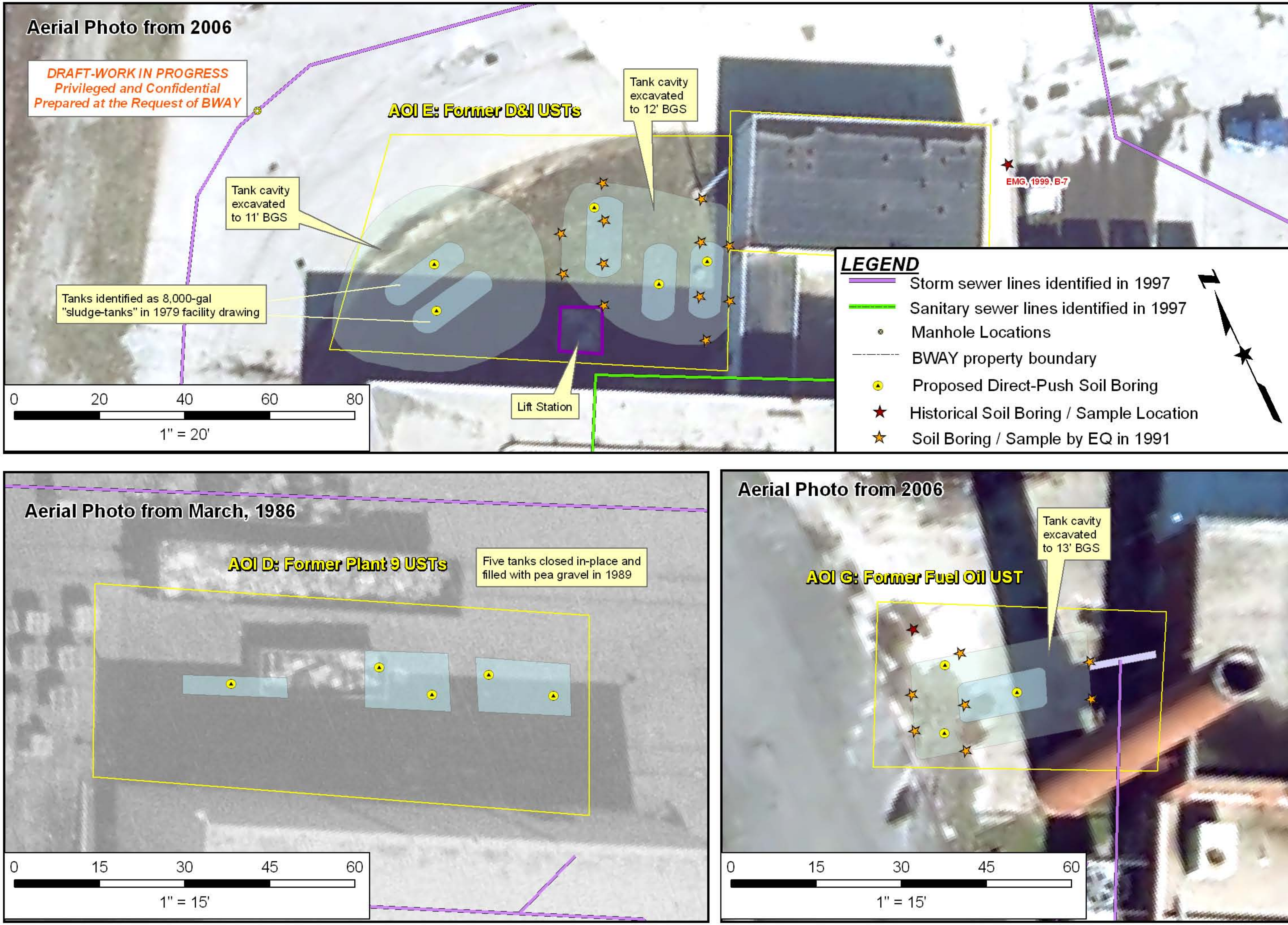

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FIGURE NO.	SOW 2B	DATE	6/10/08
DRAWN BY	MDB	REQUESTED BY	KDK
PROJECT NO.	654.13.02		

PROJECT *BWAY - RCRA Corrective Action*

TITLE *SOW #2 - Former Underground Storage Tank (UST) Locations (AOI D, E, and G)*

REFERENCE *2006 Orthophoto Courtesy CAGIS; 1986 Orthophotos Courtesy ODOT, Office of Aerial Engineering*

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SAMPLING AND ANALYSIS PLAN #3

DATE: August 11, 2008

SUBJECT: Surface Water, Sediment, Sediment Pore Water, and Shallow Soil Investigation

PROJECT NO.: RCRA 3008(h) Consent Order RCRA-05-2007-0011
Bway Corporation
Cincinnati, Ohio OHD 004 253 225
Project No. 0654.13.05

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1. OBJECTIVES

This Sampling and Analysis Plan (SAP) outlines the surface water, sediment, sediment pore water, and shallow soil sampling tasks that will be undertaken at the Bway Corporation Metal Container Manufacturing Facility, located in Cincinnati, Ohio (Bway). This work is being conducted to satisfy requirements of a September 13, 2007 Administrative Order of Consent (Order) between the United States Environmental Protection Agency (U.S. EPA) Region 5 and Bway. The areas to be sampled were identified in the *U.S. EPA RCRA Corrective Action Current Conditions Report* (CCR; Payne 2007) and U.S. EPA's December 6, 2007 comments on the CCR.

The purposes of the sampling event are to (1) to determine if there has been a release of hazardous waste or hazardous constituents to surface water, sediment, sediment pore water and/or surface soil at or adjacent to the facility; and (2) to provide an initial assessment of the potential for site-related ecological impacts from past releases of hazardous waste or hazardous constituents to surface water, sediment, and surface soil. It is anticipated that this will be a phased approach, such that decisions regarding the need for further investigation will be made based on professional judgment following a qualitative data review, including the magnitude of the concentrations, spatial distributions, and a comparison with relevant risk-based screening criteria and background levels. Depending on these initial results, additional characterization samples may be collected to further evaluate potential surface water, sediment, sediment pore water and shallow soil impacts, if any.

Specific objectives of the scope of work include investigation of the following areas and environmental media:

- Solid Waste Management Unit (SWMU) 22 – Storage Pond: surface water & sediment
- SWMU 23 – Land Application Treatment Area: surface soil
- Area of Interest (AOI) B – Suspect Former Process Wastewater Sewer Discharge: surface water, sediment and pore water
- AOI C – Historical Debris Area: surface soil, surface water & sediment

2. WORK TO BE COMPLETED

A. Surface Water Sampling

Surface water samples will be collected from the following areas: (1) the closed quarry pond owned by Martin Marietta to the east and north of the facility associated with the outfall from AOI B (6 samples); (2) the two closed quarry ponds on-Facility within AOI C (3 samples from each pond); and (3) the storage pond on-Facility within SWMU 22 (3 samples). At AOI B, six surface water samples will be collected in the immediate vicinity of the suspected sewer line discharge point (see Figure SAP 3A). The sample locations for AOI C and SWMU 22 will be evenly distributed within the ponds as shown on Figure SAP 3A. Surface water sampling methodology is provided in Section 3A below.

All surface water samples will be analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), including alkylated polycyclic aromatic hydrocarbons (PAHs), TAL total and dissolved metals, hardness, pH and total and dissolved organic carbon (TOC and DOC).

In addition, as part of the surface water investigation, an evaluation of the water depth and the general topography of the pond bottom will be evaluated through depth to bottom measurements spaced at approximately 100 feet intervals across the pond. At each location, water quality measurements as described in Section 3A will also be collected.

B. Sediment Sampling

Surface sediment (i.e., the biologically active zone 0-0.5 feet below sediment surface) samples will be collected from the following areas: (1) the closed quarry pond owned by Martin Marietta to the east and north of the facility associated with the outfall from AOI B (6 samples); (2) the two closed quarry ponds on-Facility within AOI C (3 samples from each pond); and (3) the storage pond on-Facility within SWMU 22 (3 samples). The sediment samples will be collocated, if possible, with the surface water sample locations described in Section 2A above. In addition, sediment cores will be collected as close as possible to the three near shore sediment sampling locations to assess lithology. Sediment sampling methodology is provided in Section 3B below.

The sediment samples are being collected from AOI C and SWMU 22 to address U.S. EPA's December 6, 2007 comment letter on the November 8, 2007 CCR, which requested shallow soil samples for ecological assessment purposes at these areas. As sediment is the most ecologically relevant media in areas such as SMWU 22, sediment sampling is anticipated instead of shallow soil sampling. Because of the size and drainage characteristics of AOI C, shallow soil samples will also be collected near the water bodies as discussed in Section 2D to supplement the sediment sampling.

All surface sediment samples will be analyzed for VOCs, SVOCs, including alkylated PAHs, TAL metals, TOC, grain size and pH, with contingent analyses for acid volatile sulfide and simultaneously extracted metals (AVS-SEM) if warranted based on total metal concentrations.

C. Sediment Pore Water Sampling

As requested by USEPA in a teleconference meeting on August 5, 2008, sediment pore water samples will be collected within the closed quarry pond owned by Martin Marietta to assess water quality in the ground-water/surface-water transition-zone. The sediment pore water samples will be collocated, if possible, with the three near shore surface water/sediment sampling locations associated with AOI B. At each of the three locations, one sediment pore water sample will be collected within 0-0.5 feet below sediment surface (i.e., the biologically active zone), and one pore water sample will be collected at a depth of at least 2 feet below sediment surface, depending on the sediment characteristics and sampling equipment limitations. Sediment pore water sampling methodology is provided in Section 3C below.

All sediment pore water samples (0.5 feet interval at a depth of at least 2 feet below sediment surface) collected using direct pore water sampling methods (see Section 3C) will be analyzed for VOCs, SVOCs, TAL total and dissolved metals, hardness, pH, TOC, and DOC.

D. Surface Soil Sampling

In accordance with USEPA's December 6, 2007 comment letter, shallow surface soil (i.e., 0-0.5 feet below ground surface [bgs]) samples will be collected from within AOI C (6 samples) to supplement the six sediment samples collected from within the ponds. These shallow soil sampling locations will be field determined and biased to areas of sediment deposition and/or wetland soil characteristics. In addition, in accordance with USEPA's December 6, 2007 comments, surface (i.e., 0-2 feet bgs) soil samples (12 samples) will be collected from within SWMU 23 to characterize surface soil within the waste water treatment plant effluent spray field (see Figure SAP 3A). The samples will be collected from representative locations within the radius of influence of the spray field sprinkler heads. Surface soil sampling methodology is provided in Section 3D below.

All surface soil samples collected in AOIs/SMWUs will be analyzed for VOCs, SVOCs, TAL metals and pH.

3. SAMPLING METHODOLOGY

The field activities associated with surface water, sediment, and soil sampling will follow applicable Standard Operating Procedures (SOPs) as provided in the Quality Assurance Project Plan (QAPP).

A. Surface Water

Surface water samples will be collected before sediment sampling is initiated. Prior to surface water sampling, field measurements of pH, temperature, specific conductance, dissolved oxygen, and turbidity will be recorded using a multiparameter water quality meter. The instrument will be calibrated according to the manufacturer's instructions each day prior to use.

Depending on the water depth, a small boat may be used for sample collection. At each sampling location, grab samples of surface water will be collected into a dedicated 2-liter plastic sample container (i.e., transfer container) that has not been pre-preserved.

Sampling containers will be held upgradient of the field personnel, if appropriate. Grab samples will be collected from within the lower two-thirds of the water column. Surface water from the 2-liter transfer container will be placed into sample containers, containing preservative, if appropriate. Prior to shipment, and as soon as possible after collection, those samples designated for dissolved metals analysis will be filtered using a peristaltic pump and 0.45 micron mesh filter; the resulting filtrate will be placed into a pre-preserved sample container and labeled for dissolved metals analysis.

Surface water samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested.

B. Sediment

Surface sediment samples will be collected for analysis from depositional areas as close as practical to the pre-designated sampling locations. Locations will be selected to provide sample representativeness, considering substrate for benthic organisms, consistency in grain size, and absence of plant material. Depending on site conditions, it may be preferable to not take a shallow sample at a given location, rather than to collect coarse-grained material from the surface or fine-grained material from a depth that is below the biologically active zone (i.e., greater than 0-0.5 feet bgs). Such field modifications may result in collection of fewer than the proposed number of sediment samples, in order to ensure the representativeness and quality of all sediment samples collected.

Surface sediment samples will be collected using a grab sampler (either stainless steel scoops or a Ponar Type sampler, depending on the depth of the water). If using a Ponar Type sampler, the sampler will be lowered through the water to the underlying sediment until refusal. The sampler will then be brought to the surface. Any free water from the scoops or Ponar will be carefully decanted.

Two types of sediment samples will be collected: composite and discrete samples. Composite samples will be used for most chemical analyses to satisfy total sample volume requirements and will consist of several sediment grab samples from within each sampling location. Prior to filling the sample containers, sediment from all of the grab samples taken from a single location will be placed in a stainless steel bowl and mixed using a plastic spoon until it is visually observed to be homogeneous; excessive mixing will be avoided to maximize sample integrity. Visible plant material (roots, shoots, leaves) and rocks will be removed prior to filling sample containers. Sample containers should be packed as full as possible to minimize empty head space. Discrete sediment samples will be collected for certain analyses (i.e., VOCs and AVS-SEM) to minimize artifacts associated with changes in oxidation-reduction potential (redox) conditions or excess handling. Discrete samples will not be homogenized prior to filling sampling containers and will be packed as full as possible to minimize empty head space.

Sediment samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested. Upon completion, a licensed surveyor will locate the coordinates and elevations of the sampling locations, if appropriate.

C. Sediment Pore Water

Sediment pore water samples (two depths each) will be collocated with the three near shore sediment sample locations and collected using a direct pore water sampler (e.g., push point sampler, piezometer, Trident probe). For the deep pore water sample, the sampler will be inserted as deep as possible into the sediment, but at least 2 feet below the sediment surface. Pore water will be collected from the probe and placed immediately and directly into appropriate sample containers. Prior to shipment, and as soon as possible after collection, those samples designated for dissolved metals analysis will be filtered using a peristaltic pump and 0.45 micron mesh filter; the resulting filtrate will be placed into a pre-preserved sample container and labeled for dissolved metals analysis.

Alternatively, if direct pore water samplers do not provide an effective and efficient method to obtain sediment pore water (e.g., samplers clog due to fine-grained sediment), then a direct-push sampler will be used to collect the pore water samples. Sufficient saturated sediment volume will be collected from the appropriate depths (0-0.5 feet and at least 2 feet below the sediment surface) using the direct-push sampler. The sediment will be placed into unpreserved sample containers and sent to the analytical laboratory for extraction of pore water using centrifugation, with analysis for total chromium only due to the prohibitively large quantity of sediment that would be needed to obtain sufficient pore water for analysis of the full project chemical list.

Pore water samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested.

D. Surface Soil

Shallow surface soil samples from the 0-0.5 feet interval will be collected within AOI C using a trowel or decontaminated hand auger. Surface soil (i.e., 0-2 feet bgs) sampling locations within SWMU 23 will be preferentially sampled with direct-push Geoprobe® rig equipment if access is available. If access is not available, then the locations will be hand-augured. All borings will be abandoned to the ground surface in accordance with project SOPs.

Soil samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested. Upon completion, a licensed surveyor will locate the coordinates and elevations of the sampling locations, if appropriate.

4. SAMPLING CONTAINERS, IDENTIFICATION, ANALYSIS AND PRESERVATION

The surface water samples will be labeled as SW-01[date], sediment samples will be labeled as SED-01[date].

The soil samples will be labeled as B-01/02-04/ [date] and sediment pore water samples will be labeled as SPW-01 [date] where:

B-01/02-04/ [date], Location identification;
B-01/02-04/ [date], Interval of sample in feet below ground surface;
B-01/02-04/ [date], Date of Sample Collection.

Soil and water samples will be analyzed to meet the regulated thresholds in compliance with USEPA. The QAPP outlines the appropriate analytical methods, sample containers, holding times and preservatives for the constituents of interest.

Excess soil/sediment and water will be contained in 55-gallon drums stored at the Bway facility. Upon characterization of the investigation derived waste, the Bway environmental manager will coordinate disposal.

5. SAMPLE HANDLING AND SHIPMENT

Samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested. Samples will be shipped to and analyzed by the project laboratory, as discussed above.

6. FIELD DOCUMENTATION

6.1 Field Logbook

A field logbook will be used to record facts and circumstances of the sampling event. Information recorded in the logbook/field form will include the following:

- Name of sampling personnel;
- Sample location;
- Time and date;
- Weather conditions;
- Sample type (i.e. grab, composite, etc.); and
- Pertinent sample data.

6.2 Chain-of-Custody

Chain-of-custody documentation will accompany each sample shipment. The chain-of-custody record will record the project name, type of sample collected, date of sample collection, name(s) of the person(s) responsible for sample collection, date of custody transfer, signature of the person relinquishing and accepting sample custody, and other pertinent information.

7. EQUIPMENT DECONTAMINATION

Decontamination procedures include:

- Field Equipment coming into contact with contaminated materials (e.g., direct-push shoe and rods or hand auger, stainless steel scoops or Ponar sampler, etc.) will be decontaminated in accordance with the Payne Firm SOPs 5-1 (Decontamination of Soil Sampling Equipment). Disposable one-time use sampling equipment will be discarded after each use (e.g., plastic bailers and tubing);
- Decontamination procedures include:

- o Scrub the sampling equipment in a non-phosphate detergent solution (Bucket #1);
- o Rinse thoroughly with distilled water (Bucket #2);
- o Rinse thoroughly with a 1% hydrochloric acid solution (Bucket #3)
- o Rinse thoroughly with distilled water and allow to air dry; (Bucket #4);
- o Rinse with methanol and allow to air dry; (Bucket #5)
- o Rinse thoroughly with distilled water and allow to air dry (Bucket #6);
- o If oil or notable contamination is present, the field coordinator should determine if additional decontamination methods are necessary.

Decontamination solutions will be contained and new solutions used periodically during each day of sampling. All decontamination solutions will be contained and properly disposed.

8. QUALITY ASSURANCE

Sample collection, quality assurance/quality control procedures, and employment of data quality objectives will be conducted by the Payne Firm in accordance with the QAPP. The general level of the QC effort will consist of one field duplicate, one field equipment rinseate, one field blank, and one matrix spike/matrix spike duplicate (MS/MSD) per 20 investigative samples. One VOC trip blank sample will be prepared by the laboratory and will be included along with each shipment of aqueous VOC samples. VOC trip blanks will be preserved by the laboratory in the same manner as the investigative samples.

- The trip blank samples will be identified as: TB01/ [date]. The trip blank sample will be analyzed for VOCs only.
- The duplicate samples will be collected at the discretion of the field coordinator. The duplicate samples will be identified successively as: DUP01/ [date], DUP02/ [date], etc. The duplicate sample will be analyzed for the same parameters as the original sample.
- The rinse water sample will be collected after the sample equipment has been properly decontaminated at the end of the day. The sample will be collected by pouring laboratory grade water over the equipment, as appropriate, into the appropriate sample containers. The laboratory grade water will be provided by the project laboratory. The rinse water sample will be labeled as: RIN01/ [date]. This QA/QC sample will be analyzed for VOCs, SVOCs and metals.
- The field blank sample will be collected by filling laboratory grade water directly into the appropriate sample containers. The field blank sample will be labeled as FB01/ [date]. The field blank sample location should be noted in the field notes. This QA/QC sample will be analyzed for VOCs.
- One MS/MSD will be collected for every 20 or fewer investigative samples. MS/MSD water samples must be collected at triple volume for VOC and double the volume for extractable organics. No additional volume is required for solid samples.
- At the beginning of each day, the organic vapor analyzer and the water quality meter will be calibrated. Calibration results will be documented in the log book.

9. SAMPLING TEAM

Project Manager-Kevin D. Kallini, P.G.
Field Coordinator/Quality Assurance Officer-Matthew D. Birck
Field Samplers-Payne Firm

Surface Water/Sediment & Shallow Surface Soil Samplers
ENVIRON field personnel-Christopher M. Buzgo, Ph.D., Manager
ENVIRON field personnel-Katrina Leigh, Senior Ecologist

Pore Water Samplers
Payne Firm and ENVIRON-Christopher M. Buzgo and Katrina Leigh

Table 1: Surface Water, Pore Water, Shallow Soil/Sediment Sampling Methodology

Area	Sampling Scope	Sample Determination Criteria	Purpose	Source
SWMU 22 - Storage Pond	Three (3) co-located sediment and surface water sampling locations: - surface water samples (VOCs, SVOCs including alkylated PAHs, TAL total and dissolved metals, hardness, pH, TOC and DOC) and - surface sediment samples from 0-0.5 feet (VOCs, SVOCs, including alkylated PAHs, TAL metals, contingent AVS/SEM metals, TOC, grain size and pH)	Three (3) locations selected to provide representative coverage of pond	Verify no past release of hazardous materials could pose an unacceptable risk to ecological receptors	Specified in USEPA's December 2007 CCR comment letter
SWMU 23 - Land application treatment area	Twelve (12) surface soil samples from 0-2 feet bgs (VOC, SVOC, TAL Metals and pH)	Twelve (12) locations to provide representative coverage of sprayfield	Verify no past release of hazardous materials could pose an unacceptable risk to ecological receptors	Specified in USEPA's December 2007 CCR comment letter
AOI B - Former Process Sewer Line	Six (6) co-located sediment and surface water locations and three (3) collocated pore water samples (near shore locations) collected at 2 depths (6 samples): - surface water and pore water1 samples (VOCs, SVOCs including alkylated PAHs, TAL total and dissolved metals, hardness, pH, TOC and DOC) - surface sediment samples from 0-0.5 feet (VOCs, SVOCs, including alkylated PAHs, TAL metals, contingent AVS/SEM metals, TOC, grain size and pH)	1 - existing outfall point, 1- historical outfall point, 1 - original outfall point for sediment, surface water and pore water and 3 (total) - north of each of the above locations	Characterize potential discharges to surface water, sediment and the ground water/surface water interface in the northern gravel pit pond.	Specified in the Section 5.23.3 of the CCR and verbal comments from USEPA on August 5, 2008 conference call.
AOI C - Historical debris area	Three (3) co-located surface water and sediment sample locations: - surface water samples (VOCs, SVOCs including alkylated PAHs, TAL total and dissolved metals, hardness, pH, TOC and DOC) - surface sediment samples from 0-0.5 feet (VOCs, SVOCs, including alkylated PAHs, TAL metals, contingent AVS/SEM metals, TOC, grain size and pH) in each of 2 small ponds Six (6) shallow soil samples from 0-0.5 feet bgs (VOCs, SVOCs, TAL Metals and pH)	Three (3) sediment/surface water locations to provide representative coverage in each of 2 ponds Six (6) shallow soil sampling locations biased to depositional areas and/or wetland soil characteristics	Verify no past release of hazardous materials could pose an unacceptable risk to ecological receptors	Specified in USEPA's December 2007 CCR comment letter

Notes:
1 - Samples collected via direct pore water sampling methods will be anlayzed for all parameters. Pore water collected via centrifugation, if appropriate will be analyzed for total chromium only.

The Payne Firm, Inc.

BWAY CORPORATION

Cincinnati, Ohio OHD 004 253 225

RCRA 3008(h) Consent Order RCRA-05-2007-0011

Project No. 0654.13.05

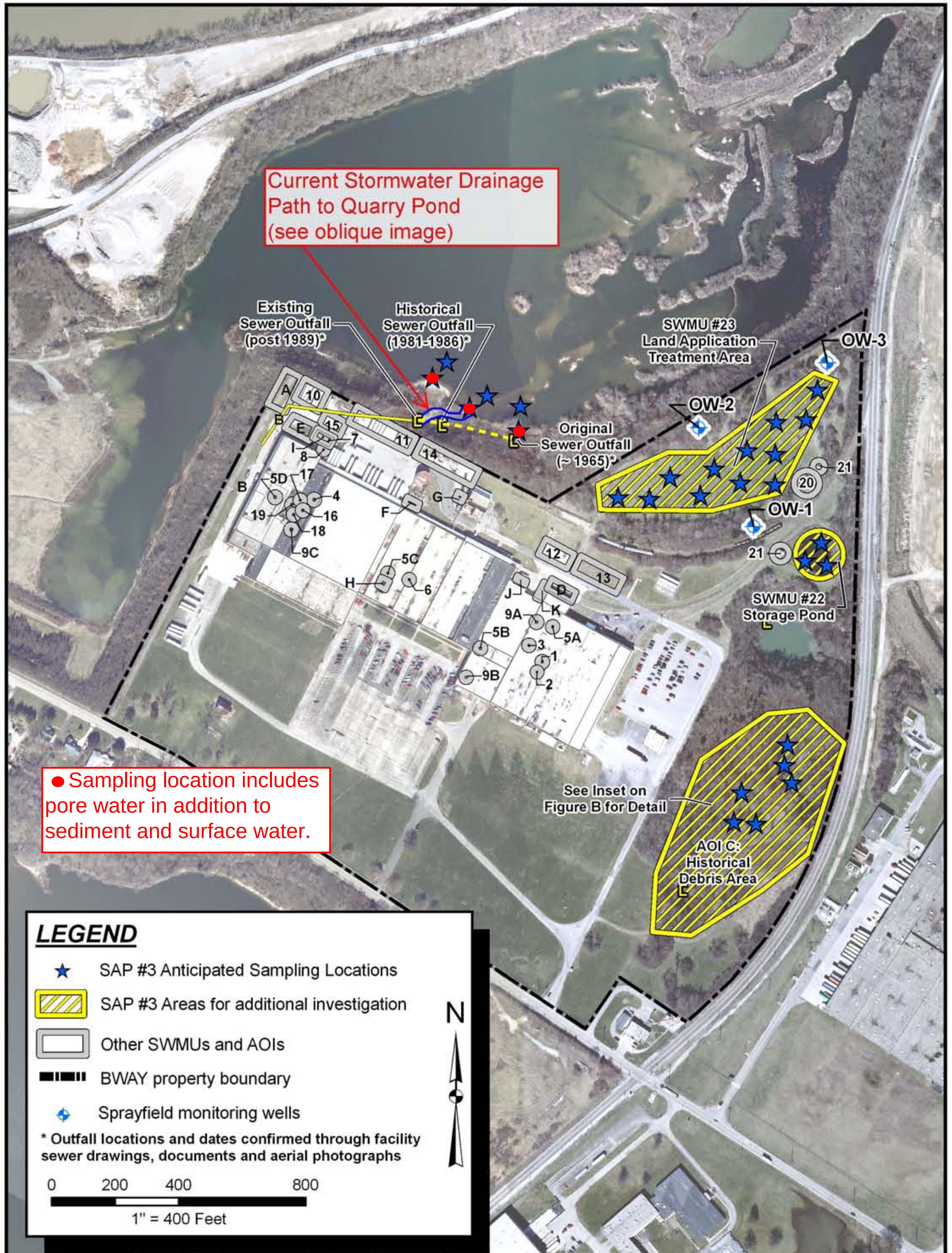
APPENDIX I: Data Objective Summary Form

Activity:	Sampling and Analysis Plan #3
Sample Media:	Surface Water
Sample Type:	Grab
Number of Samples:	15 total, divided as follows: AOI-B off-property quarry pond: 6; SWMU 23 on-property storage pond: 3; AOI C on-property quarry ponds: 3 ea.
QA/QC Samples:	1 field blanks
	1 field duplicates
	1 MS/MSD
	1 Trip blank per VOC cooler
	1 Equipment rinsate per day of sampling
Sampling Procedures:	See applicable SOPs attached to QAPP and SAP #3
Analytical Methods:	VOC, SVOCs including alkylated PAHs, TAL total and dissolved metals, hardness, pH, DOC and TOC.
Appropriate Analytical Levels:	ASL-IV
Activity:	Sampling and Analysis Plan #3
Sample Media:	Sediment
Sample Type:	Grab
Number of Samples:	15 total, divided as follows: AOI-B off-property quarry pond: 6; SWMU 23 on-property storage pond: 3; AOI C on-property quarry ponds: 3 ea.
QA/QC Samples:	1 field blanks
	1 field duplicates
	1 MS/MSD
	1 Trip blank per VOC cooler
	1 Equipment rinsate per day of sampling
Sampling Procedures:	See applicable SOPs attached to QAPP and SAP #3
Analytical Methods:	VOC, SVOCs including alkylated PAHs, TAL total and dissolved metals, contingent AVS/SEM metals, pH, grains size and TOC.
Appropriate Analytical Levels:	ASL-IV

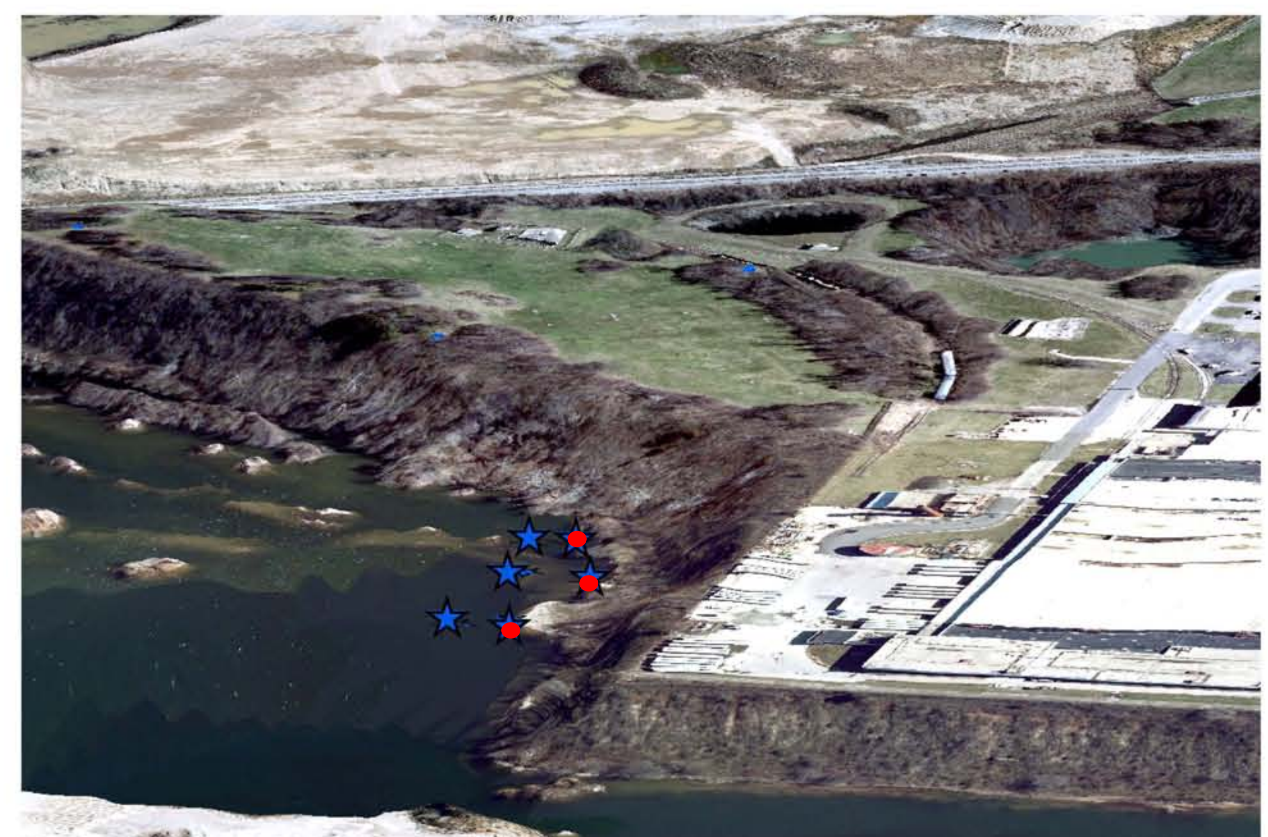
The Payne Firm, Inc.

Activity:	Sampling and Analysis Plan #3
Sample Media:	Sediment Pore Water
Sample Type:	Grab
Number of Samples:	6 total from AOI-B off-property quarry pond, collocated with near-shore surface water & sediment locations from two vertical intervals
QA/QC Samples:	1 field blanks
	1 field duplicates
	1 MS/MSD
	1 Trip blank per VOC cooler
	1 Equipment rinsate per day of sampling
Sampling Procedures:	See applicable SOPs attached to QAPP and SAP #3
Analytical Methods:	VOC, SVOCs including alkylated PAHs, TAL total and dissolved metals, hardness, pH, DOC and TOC.
Appropriate Analytical Levels:	ASL-IV
Activity:	Sampling and Analysis Plan #3
Sample Media:	Surface Soil
Sample Type:	Grab
Number of Samples:	12 total from SWMU 23 land-application sprayfield
QA/QC Samples:	1 field blanks
	1 field duplicates
	1 MS/MSD
	1 Trip blank per VOC cooler
	1 Equipment rinsate per day of sampling
Sampling Procedures:	See applicable SOPs attached to QAPP and SAP #3
Analytical Methods:	VOC, SVOCs, TAL metals, pH
Appropriate Analytical Levels:	ASL-IV

Sampling and Analysis Plan #3: Plan View *and* Oblique Perspectives Using a Digital Elevation Model



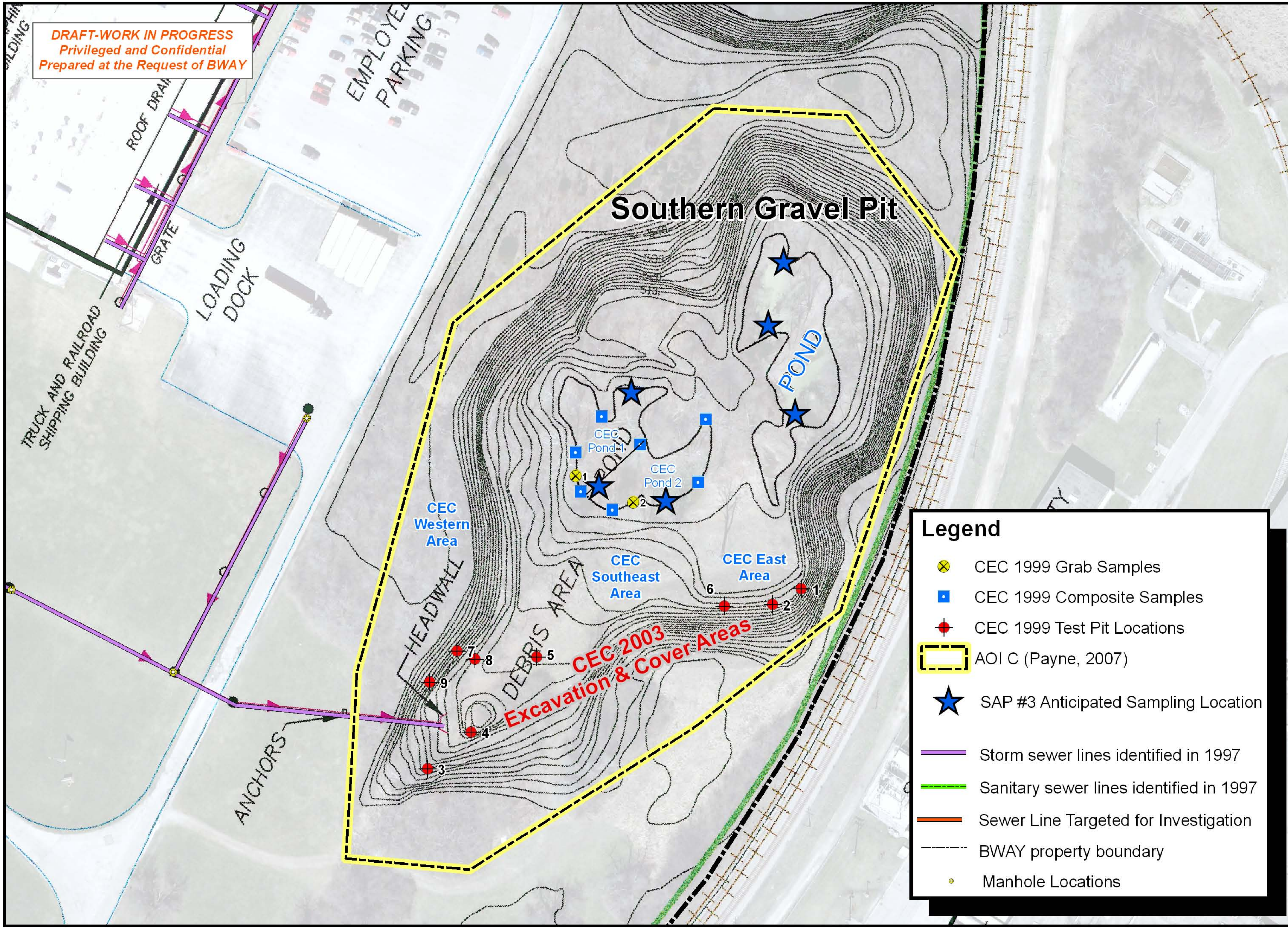
Sprayfield and Quarry Pond Sample Points as Viewed from the Northeast



BWAY Facility, Quarry Pond, and Sprayfield as Viewed from the West

G:\GIS_Projects\GIS_0654.13.00_Bway_CA\MXDs\RFI\Gravel_Pit_Oblique_Perspectives.mxd

The Payne Firm, Inc. Environmental Consultants Cincinnati / Cleveland / Chicago	
FIGURE NO. DRAFT	DATE 8/1/08
DRAWN BY MDB	REQUESTED BY KDK
PROJECT NO. 654.13.05	
PROJECT	BWAY - RCRA Corrective Action
TITLE	SAP #3 Plan and Oblique Views of Target Sample Areas
REFERENCE	2006 Orthophoto Courtesy CAGIS; 2.5-ft Resolution DEM courtesy CAGIS (Beta Version)



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The Payne Firm, Inc.
Environmental Consultants
Cincinnati / Cleveland / Chicago

FIGURE NO.	SAP #3A	DATE	6/30/08
DRAWN BY	MDB	REQUESTED BY	KDK
PROJECT NO.	654.13.05		

PROJECT BWAY - RCRA Corrective Action

TITLE SAMPLING AND ANALYSIS PLAN #3
Surface Water, Sediment, and Shallow Soil Investigation

REFERENCE 2006 Orthophoto Courtesy CAGIS; 1998 Payne Firm Baseline Environmental Assessment (BEA) Appendix III: Summary of Sewer Network

SAMPLING AND ANALYSIS PLAN NO. 4

DATE:	6/19/14
SUBJECT:	Supplemental RFI
PROJECT NO.:	212114.0000.0000 RCRA 3008(h) Consent Order RCRA-05-2007-0011 Bway Corporation Cincinnati, Ohio OHD 004 253 225

1. OBJECTIVES

This Sampling and Analysis Plan (SAP) outlines the installation of monitoring wells and quarterly sampling tasks that will be undertaken at the Bway Corporation Metal Container Manufacturing Facility, located in Cincinnati, Ohio (Bway). This work is being conducted, in part, to satisfy requirements of a September 13, 2007 Administrative Order of Consent (Order) between the United States Environmental Protection Agency (U.S. EPA) Region 5 and Bway. USEPA is directing Bway to develop and submit a Work Plan for the supplemental characterization work at the Bway site outlined below.

As referenced in EPA's letter to Bway dated May 22, 2014, USEPA still believes further ground-water characterization is needed. Based on the outcome of recent discussions with EPA in a meeting of April 15, 2014, outlined below is the proposed scope of work in response to comments and "Requirements for Additional Work" provided in USEPA's correspondence dated May 22, 2014.

At this time, we understand the additional scope of work will consist of:

1. Four new water-table ground-water monitoring wells be installed at prescribed locations on the Bway site referenced in USEPA's May 22, 2014 letter (see attached figure for planned well locations).
2. As indicated in well logs submitted by Bway and reviewed by USEPA, the saturated thickness in the water-table aquifer below the facility is in the range of ten to fifteen feet thick. Per USEPA's request, should the saturated interval at any of the proposed well locations cited above exceed twenty feet, Bway shall install a well pair at that location. The well pair shall consist of one well screened across the water table and a second well with a five-foot screen which terminates at the top of the clay. The groundwater table is approximately 50 to 70 feet below the ground surface in that area of the Facility. Groundwater flow is generally to the northwest toward the inactive quarry pond as shown on Figure 1.
3. Confirmatory groundwater sampling of the existing sprayfield wells, quarterly sampling of the new wells, data validation and data screening with progress reporting to the USEPA. Ground-water samples will be collected quarterly for

one year from each of the new wells. All samples will be analyzed for the RCRA Appendix IX constituents volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), target analyte list (TAL) metals. The continuation or termination of the monitoring will be based upon an assessment of the quarterly results.

4. Communication with USEPA, Bway, Ball, TRC and ENVIRON representatives as warranted.

2. WORK TO BE COMPLETED

A. Monitoring Well Installation

Four water table groundwater monitoring wells and potentially four deep well pairs will be installed at the locations shown on Figure 1.

Given the complication of encountering heaving sands during well installation, Sonic Drilling Services (SDS) will utilize a truck-mounted sonic rig with 6 inch casing and 4 inch continuous core sampling to the target depth (TD) between 65 and 75 feet. The new 2 inch monitoring wells will then be constructed with 10 feet of 2 inch PVC screen for the water table wells and 5 foot screen for the deep well (if necessary) with PVC riser. This will be followed by installation of the sand pack, seal and chip to the flush-mount vault elevation. Cuttings and fluids will be contained and the wells will be developed. Soil will also be screened for VOCs using a PID and inspected for indications of contamination (e.g., staining, odors, etc.). Core collection, quality assurance/quality control procedures, employment of data quality objectives, and containment of drilling waste will be coordinated by TRC in accordance with TRC's SOPs and site-specific Quality Assurance Project Plan (QAPP).

B. Well Development

At least 24 hours after installation, each monitoring well will be developed by surging and pumping techniques. Per EPA Region 5 guidance, 1.5-times the water lost to the formation via drilling will be pumped out. Development will be considered complete when either turbidity is below 50 nephelometric turbidity units (NTUs), the well purges dry, or 10 well volumes have been removed, whichever occurs first.

C. Groundwater Sampling of Monitoring Wells

One round of groundwater samples will be collected from the existing sprayfield wells (OW-1, OW-2 and OW-3) along with four quarters from the new wells. The monitoring wells will be gauged for total well depth and depth to water. Depth to water measurements will be used to prepare groundwater surface elevation contour maps, to be provided in the quarterly progress reports. Groundwater samples will be analyzed for the RCRA Appendix IX constituents: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), target analyte list (TAL) metals. The continuation or termination of the monitoring will be based upon an assessment of the quarterly results. Quality control samples, including matrix spike and matrix spike duplicates will be collected at a minimum frequency of one per twenty samples and analyzed for the same Appendix IX parameters. Trip blanks will be included in each cooler shipped to the laboratory.

D. Site Survey

The Site Survey will be updated to include the locations and elevations (ground surface and top of PVC well casing) of the new monitoring wells. Property boundaries shown on the base maps will be approximate, based on tax maps and not a certified boundary survey.

E. Investigation Derived Waste

- Investigation derived waste (IDW) is anticipated to include the following: drilling return water, decontamination fluids, well purge and development water, and soil cuttings.
- Soil exhibiting evidence of gross contamination will be segregated and stored separately in 55-gallon drums for characterization and off-site treatment/disposal.
- Wash and rinse water used for equipment decontamination, development water, purge water, and soil cuttings will be containerized in DOT-approved 55-gallon drums for off-site disposal.
- Used PPE and disposable sampling equipment will be bagged as regular refuse and disposed as solid waste, unless grossly contaminated.
- Materials containerized for off-site disposal will be staged on pallets at a location that is acceptable to the property owner (Bway).
- Containerized materials will be clearly marked to indicate the contents of the containers, the date of collection, and the source of the material.

F. SAMPLE HANDLING AND SHIPMENT

Samples will be labeled immediately after collection. The information on the sample label will include the project name, sample identification, sample date and time, and the analyses requested. Samples will be shipped to and analyzed by the project laboratory, as discussed above.

G. FIELD DOCUMENTATION

Field Logbook

A field logbook will be used to record facts and circumstances of the sampling event. Information recorded in the logbook/field form will include the following:

- Name of sampling personnel;
- Sample location;
- Time and date;
- Weather conditions;
- Sample type (i.e. grab, composite, etc.); and
- Pertinent sample data.

Chain-of-Custody

Chain-of-custody documentation will accompany each sample shipment. The chain-of-custody record will record the project name, type of sample collected, date of sample collection, name(s) of the person(s) responsible for sample collection, date of custody transfer, signature of the person relinquishing and accepting sample custody, and other pertinent information.

H. EQUIPMENT DECONTAMINATION

Decontamination procedures include:

- Field Equipment coming into contact with contaminated materials (e.g., drilling core barrels and rods, etc.) will be decontaminated in accordance with TRC's SOPs. Disposable one-time use sampling equipment will be discarded after each use (e.g., plastic bailers and tubing);
- Decontamination procedures include:
    - Scrub the sampling equipment in a non-phosphate detergent solution (Bucket #1);
    - Rinse thoroughly with distilled water (Bucket #2);
    - Rinse thoroughly with a 1% hydrochloric acid solution (Bucket #3)
    - Rinse thoroughly with distilled water and allow to air dry; (Bucket #4);
    - Rinse with methanol and allow to air dry; (Bucket #5)
    - Rinse thoroughly with distilled water and allow to air dry (Bucket #6);
    - If oil or notable contamination is present, the field coordinator should determine if additional decontamination methods are necessary.

Decontamination solutions will be contained and new solutions used periodically during each day of sampling. All decontamination solutions will be contained and properly disposed.

I. Data Screening and Progress Reporting

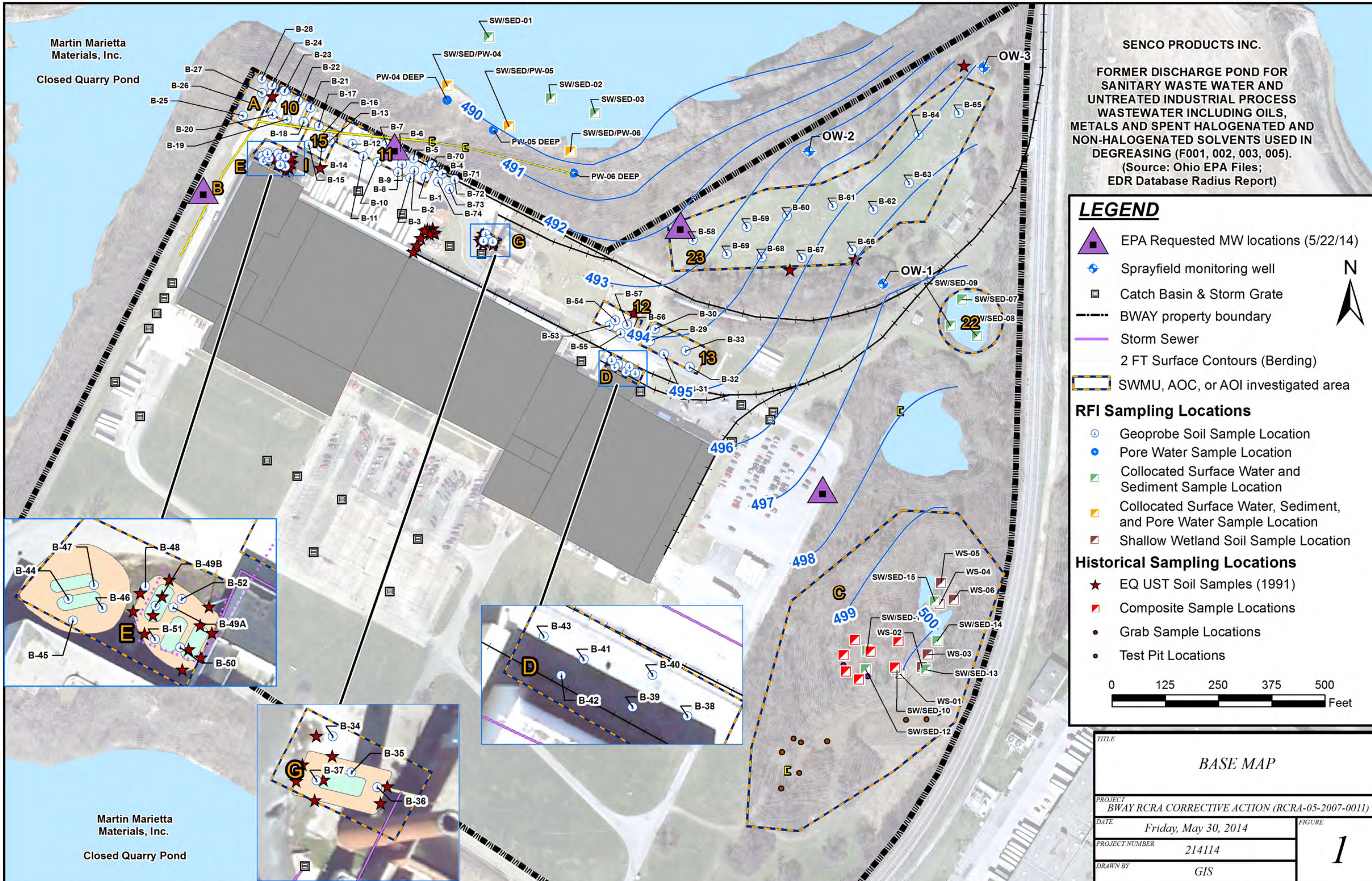
The quarterly progress reports will present the results of the supplemental investigation. The RI Report will be prepared in accordance with the applicable provisions of the September 13, 2007 Order. The report will include report text, tables, and figures which show the aerial and vertical extent of contaminants identified, describe the subsurface characteristics of the areas investigated, including physical features, geology and hydrogeology. Groundwater surface elevation contour maps showing inferred predominant groundwater flow direction will be provided. If determined, the progress report will identify the sources of contamination, migration pathways, and known actual or potential receptors of contaminants. TRC will validate the laboratory-reported results and generate a data usability summary report (DUSR). The DUSR will provide an evaluation of analytical data with the primary objective of determining whether or not the data, as presented, satisfies the project specific criteria for data quality and data use. ENVIRON will provide a screening assessment utilizing appropriate screening values when assessing the need for further monitoring. Appropriate screening values are assumed to include MCLs, Region 9 PRGs, Region 5 ESLs and RBSLs, or RAGS.

3. SAMPLING AND REPORTING TEAM

Project Manager/Field Coordinator/Quality Assurance Officer
- TRC - Kevin D. Kallini, P.G.

Field Samplers and field geologist
- TRC staff

Data Screening Assessment Project Manager
- ENVIRON - Christopher M. Buzgo, Ph.D., Manager



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TITLE
BASE MAP

PROJECT
BWAY RCRA CORRECTIVE ACTION (RCRA-05-2007-0011)

DATE	FIGURE
Friday, May 30, 2014	1
PROJECT NUMBER 214114	
DRAWN BY GIS	

TRC
11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255
http://www.trcsolutions.com/

Appendix II

CA725 Environmental Indicator Supporting Documentation

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Bway Corporation
Facility Address: 8200 Broadwell Road, Cincinnati, Ohio
Facility EPA ID #: OHD 004 253 225

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.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

This Resource Conservation and Recovery Act (RCRA) CA725 form was prepared in conjunction with a RCRA corrective action that Bway Corporation (Bway) is conducting at the Site under a September 13, 2007 Administrative Order on Consent with USEPA (Order). The boundary of the Site as defined in the Order is shown on Figure 1. This form was initially submitted to USEPA as part of the Corrective Measures Proposal dated September 29, 2009. USEPA provided comments on the CA725 in a letter dated January 9, 2014 indicating that it agreed with the determination that current human exposures are under control for contaminated soil, surface water and sediment; however, additional characterization was requested for groundwater. The USEPA provided specific requirements for additional groundwater investigation activities in a letter dated May 22, 2014. In response to the USEPA request, Bway installed six additional groundwater monitoring wells in August 2014 and conducted supplemental groundwater monitoring from September 2014 to May 2015 consisting of the collection of four rounds of groundwater data as discussed in more detail below.

During the RCRA facility investigation (RFI), Bway conducted activities to characterize the nature and extent of releases of hazardous waste and/or constituents at the Site. These activities included preparation of a Current Conditions Report (CCR, Payne Firm, 2007), which reviewed available information for the 23 solid waste management units (SWMUs) and one area of concern (AOC) identified in USEPA's 1989 Preliminary Assessment/Visual Site Inspection report (USEPA, 1989a) and described the physical condition, historical operations, and any previous investigation or remedial action at each SWMU and AOC. As part of the CCR, the available information was evaluated for each SWMU and AOC to identify those areas where additional investigation was warranted. Rationale for not conducting further investigation at certain of the other AOIs was also provided in the CCR. Based on the information in the CCR and comments provided by USEPA, Bway investigated seven of the 23 SWMUs and the one AOC as part of the current RFI activities. In addition, Bway identified eight Areas of Interest (AOIs) and two additional SWMUs as part of the CCR. Of these, field investigation was performed at six of the eight AOIs. No field investigation was deemed warranted for the two additional SWMUs.

The SWMUs, AOC and AOIs were investigated in several phases of field work as described in Sampling and Analysis Plans (SAPs) #1, #2 and #3 (Payne Firm 2008c, 2008d, 2008f), which specified the objectives, approach, rationale and procedures for each phase of the investigation. These SAPs were submitted to and reviewed with USEPA prior to implementation. The field investigations were conducted in accordance with these SAPs and comments provided by USEPA. The data collected during the RFI and a discussion of the data collection activities are provided in the Quarterly Progress Reports (Payne Firm 2008a, 2008b, 2008e, 2008h, 2009).

The objective of the RFI field investigations was to collect data for determining whether a significant release of hazardous constituents has occurred at each SWMU, AOC and/or AOI, and to characterize the extent of a release for determining whether the release poses a significant risk under current and reasonably expected future land use, or is adversely affecting groundwater quality. The locations of the AOIs are shown on Figure 2. Figure 3 shows the sampling locations from all phases of the RFI.

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**" [1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Tables 2-2a and 2-2b
Air (indoors)[2]		X		
Surface Soil (e.g., <2 ft)		X		
Surface Water	X			Tables 2-3a and 2-3b
Sediment	X			Tables 2-4a and 2-4b
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):

For the purposes of Question 2, the presence of media that meet the definition of "contamination" is identified by comparing relevant RFI site characterization data with risk-based screening criteria. The screening criteria selected based on the conceptual site model for potential human exposures (see Table 3-1) and the results of the comparison of site characterization data with these criteria are discussed below.

All RFI soil, groundwater, surface water and sediment data were validated by the Payne Firm, Inc. (Payne Firm) in accordance with the RFI QAPP (Payne Firm 2008g). In addition, procedures used to prepare the data to support quantitative risk assessment based on USEPA guidance on human health risk assessment (USEPA, 1989b) are summarized in Appendix A. These validated data are summarized herein in Tables 2-1a through 2-4b.

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.

<u>Soil</u>

Soil characterization data were collected at those SWMUs, AOIs and AOC identified in the CCR (Payne Firm 2007) as requiring further investigation. The sampling was conducted in accordance with SAP #2 and #3 (Payne Firm 2008d, 2008f). The RFI soil characterization data for each area of the Site are summarized on Table 2-1a. For each area, Table 2-1a presents the detected constituents, the detection frequencies, the ranges of detected concentrations, and the ratios of the highest measured site-related concentrations to the screening criteria. Based on current land use at and adjacent to the site, contamination is identified based on comparison with the following soil screening criteria:

- Risk-based screening levels calculated using the methodology and conservative exposure factors for deriving USEPA Region 9 risk-based Preliminary Remediation Goals (PRGs) for residential land use (set at a target cancer risk level (TCRL) of 10^{-5} for carcinogenic constituents and a target hazard quotient (HQ) of 1 for non-carcinogenic constituents);
- Risk-based screening levels calculated using the methodology and conservative exposure factors for deriving USEPA Region 9 PRGs for industrial land use (set at a TCRL of 10^{-5} for carcinogenic constituents and a target HQ of 1 for non-carcinogenic constituents); and
- Risk-based screening levels calculated for evaluating vapor migration to indoor air based on protection of routine workers. These screening criteria are calculated based on conservative exposure factors for routine workers and a TCRL of 10^{-5} for carcinogenic constituents and a target HQ of 1 for non-carcinogenic constituents (the derivation is discussed in Appendix A).

Concentrations of metals in soil that are at or below Ohio EPA background levels (Ohio EPA, 2008) or typical Ohio background levels (Dragun 2005) for metals that are not provided by Ohio EPA are considered to be background and not site-related. Metal concentrations in soil samples that are in excess of these background levels are considered to be site-related, and are evaluated further in this risk-based screening.

Table 2-1a shows the ratio of the highest site-related concentration of each constituent in surface and subsurface soil at an area to each screening criterion. Ratios higher than 1 identify the presence of soil that meets the definition of “contamination” and are highlighted. As shown on Table 2-1a, there are no constituents with ratios higher than 1 based on the direct contact criteria.

In addition, the results of the comparison of the highest site-related concentrations to the vapor intrusion criteria also indicate, with the exception of tetrachloroethene, there are no constituents with ratios higher than 1. As shown on Table 2-1b, tetrachloroethene was detected in a single sample in SWMU 11, which is located more than 150 feet from the nearest building, at a concentration that slightly exceeds the criterion.

Based on the low levels of constituents detected in soil at the Site, there is no evidence of release to soils subject to RCRA Corrective Action.

<u>Groundwater</u>

Initial Groundwater RFI

Groundwater characterization data have been collected from three on-site monitoring wells and six off-site sediment pore water piezometer locations downgradient of the Site. As discussed in the CCR (Payne Firm, 2007), the three on-site monitoring wells were installed in 1990 within the slow rate spray application system (SWMU #23). The slow rate spray application system is currently used for the application of treated waters stored in the Storage Pond (SWMU #22), which receives treated effluent from the Biological Treatment Plant (SWMU #20) and Wet Well (SWMU #21). The three monitoring wells present in SWMU #23 include one upgradient well (OW-1), one downgradient well (OW-2), and one background well (OW-3). The wells are installed in unconsolidated sand and gravel deposits and are used to monitor the water table zone, which is approximately 50 to 70 feet below the ground surface in that area (CCR, 2007). Groundwater flow is generally to the northwest as shown on Figure 3. The monitoring wells have been monitored periodically since 1990, with the most recent sampling completed in September 2008. Quarterly groundwater data collected from the most recent sampling events (August 2007 to September 2008) are evaluated for the purposes of this CA725 determination.

As discussed in SAP #3 (Payne Firm, 2008f), six temporary sediment pore water piezometers were installed within the adjacent closed quarry pond downgradient of the site and sampled in September 2008 to assess water quality in the groundwater/surface water transition zone. The piezometers were installed near the shore and included shallow (0-0.5 feet below sediment surface) and deep (to refusal which ranged from 3.5 to 8.0 feet below ground surface) sampling depths as depicted on Figure 3.

Table 2-2a presents the constituents detected in groundwater and sediment pore water at each monitoring location, and the detection frequencies, range of detected concentrations and ratios of the highest measured concentrations with screening criteria selected based on the potential potable use of the groundwater in the region (specifically, Ohio MCLs, federal MCLs where Ohio MCLs do not exist, or Region 9 tap water ingestion values where no MCLs exist). In addition, detected concentrations in monitoring wells OW-1, OW-2 and OW-3 are compared with risk-based screening levels calculated for evaluating vapor migration to indoor air based on protection of routine workers. The vapor migration to indoor air criteria are not relevant for the sediment pore water samples and therefore a comparison to these results are not performed. These screening criteria are calculated based on conservative exposure factors for routine workers and a TCRL of 10^{-5} for carcinogenic constituents and a target HQ of 1 for non-carcinogenic constituents (the derivation of these criteria is discussed in Appendix A).

The use of drinking water criteria for this CA725 determination is conservative because no active water supply well exists at the Site and an extensive review of water use records for the area surrounding the Site identified only one historic well (installed in 1955) downgradient of the Site and within the same aquifer system as monitored at the Site (Payne Firm, 2007). However, there are no residential or industrial buildings immediately downgradient of the Site that would use this well. Potable water at and around the Site is supplied by the City of Cincinnati.

Groundwater that meets the definition of "contamination" is identified on Tables 2-2a by comparing the highest concentration of each constituent at a monitoring location to the drinking water screening criteria. The presence of groundwater that meets the definition of "contamination" is identified by ratios of concentrations to the screening criteria that exceed 1. As shown on Table 2-2a, a limited number of constituents have concentrations in on-site groundwater that are higher than the drinking water screening criteria. These constituents are as follows:

- arsenic, chromium (total), iron, lead, manganese, thallium, trichloroethene (TCE)

As shown on Table 2-2b, groundwater samples exhibiting concentrations that meet the definition of "contamination" are limited, and concentrations of constituents that exceed the drinking water criteria are not consistently detected, spatially or temporally. Based on the most recent round of groundwater sampling data collected in September 2008, the only constituent detected above the drinking water criteria was TCE, which was detected in OW-3 the eastern most monitoring well on the site (see Figure 3). As discussed in the CCR (Payne Firm, 2007), based on consistent groundwater flow direction to the northwest, the TCE in OW-3 likely originated from an off-site, upgradient source. In addition, with the exception of thallium detected at PW-06 in the dissolved sample only (but not detected in the duplicate sample or the unfiltered sample from the same location) there were no exceedances of the drinking water criteria identified in the downgradient piezometers. Thallium was also detected at least once in the background well OW-3 above drinking water criteria.

An evaluation of the groundwater data to assess potential vapor intrusion indicates no groundwater concentrations are higher than the risk-based vapor migration to indoor air screening criteria, as shown on Table 2-2a.

Supplemental Groundwater Monitoring

The supplemental groundwater investigation was conducted in accordance with SAP #4 (TRC, 2014), which was approved by USEPA on July 9, 2014 and initiated in August 2014. The locations of all monitoring wells and sampling results are provided on Figure 1 of Appendix B. A comparison of all groundwater data collected as part of this supplemental monitoring conducted from September 2014 to May 2015 is provided on Tables B-1a and B-1b of Appendix B. The results for the supplemental groundwater monitoring wells installed in August 2014 are summarized under "Unassigned" on Table B-1a.

As presented in Appendix B, the monitoring results for the last four quarters of monitoring are compared with criteria based on potential potable use of groundwater (specifically, Ohio MCLs, federal MCLs where Ohio MCLs do not exist, or USEPA November 2015 Regional Screening Levels where MCLs do not exist). Table B-1a provides a comparison of maximum detected concentrations of constituents to the groundwater screening criteria. Table B-1b provides a sample-by-sample comparison to the groundwater screening criteria. As presented on Table B-1a, the maximum concentrations of two constituents, TCE and manganese, are higher than the drinking water screening criteria. As shown on Table B-1b, these constituents were only detected above the screening criteria in the background monitoring well, OW-3, the eastern most monitoring well on the site. Based on consistent groundwater flow direction to the northwest and information available for the adjacent facility, concentrations of TCE and manganese likely originated from an upgradient, off-site source.

Based on the low levels of constituents detected in groundwater at the Site, and the presence of an upgradient off-site source, there is no evidence of site-related releases to groundwater subject to RCRA Corrective Action. Nonetheless, the potential for current human exposure to concentrations in groundwater that are higher than the screening criteria is discussed below under Question 3.

<u>Surface Water</u>

Surface water characterization data have been collected on-site in SWMU 22 and AOI C and off-site in AOI B (quarry pond) in accordance with SAP #3 (Payne Firm, 2008f). The sampling locations are depicted on Figure 3. Table 2-3a presents the constituents detected at each location, the detection frequencies, the ranges of detected concentrations and the ratios of the highest measured concentrations to the screening criteria. Similar to groundwater, drinking water criteria are used to screen the surface water sampling data, however, as indicated in the conceptual site model (Table 3-1), this approach is very conservative since neither on-site or off-site surface water is used for a drinking water source.

Surface water that meets the definition of "contamination" is identified on Tables 2-3a by comparing the highest concentration of each constituent at a location to the drinking water screening criteria. The presence of surface water that meets the definition of "contamination" is identified by ratios of concentrations to the screening criteria that exceed 1. As shown on Table 2-3a, a limited number of constituents have concentrations in on- or off-site surface water that are higher than the drinking water screening criteria. These constituents are as follows:

- antimony, mercury, thallium

As shown on Table 2-3b, surface water that meets the definition of "contamination" is limited, with concentrations of constituents that slightly exceed the drinking water criteria identified in four of six locations in AOI B, two locations in AOI C and one location in SWMU 22. None of these locations is a drinking water source.

However, it should be noted that these constituents were not identified as site-related contaminants based on other on-site sampling. Nonetheless, the potential for current human exposure to concentrations in surface water that are higher than the screening criteria is discussed below under Question 3, and the significance of any potential exposure is discussed below under Question 4.

<u>Sediment</u>

Collocated sediment characterization data have been collected at the surface water sampling locations described above in accordance with SAP #3 (Payne Firm, 2008f). The sampling locations are depicted on Figure 3. Table 2-4a presents the constituents detected at each location, the detection frequencies, the ranges of detected concentrations and the ratios of the highest measured concentrations to the screening criteria. The primary set of sediment screening criteria used to guide the sediment investigation is based on residential and routine worker direct contact with soil, as described above for soil data screening.

Use of these soil screening criteria to evaluate the sediment data is highly conservative because potential exposure of residents or workers to sediment is much lower than the soil exposures assumed in derivation of the PRGs. However, for the purposes of this CA725 determination, ratios higher than 1 on Table 2-4a are conservatively considered to identify the presence of material that meets the definition of "contamination" and are highlighted.

As shown on Table 2-4a, a limited number of constituents have concentrations in on- or off-site sediment that are higher than the direct contact criteria. These constituents are:

- aluminum, arsenic, iron, benzo(a)pyrene, dibenz(a,h)anthracene

As shown on Table 2-4b, sediment that meets the definition of contamination is limited to four locations in AOI B, four locations in AOI C and three locations in SWMU 22. However, it should be noted that these constituents were not identified as site-related contaminants based on other on-site sampling. Nonetheless, the potential for current human exposure to concentrations in sediment that are higher than the screening criteria is discussed below under Question 3, and the significance of any potential exposure is discussed below under Question 4.

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

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

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

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

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

Scenarios for potential human exposure under current and future conditions at and around the Site are summarized on Table 3-1, although only current exposures are pertinent to the CA725 determination. It should be noted that the above "Summary Exposure Pathway Evaluation Table" is constrained by its format to be an extremely condensed summary of Table 3-1, and the reader should refer to Table 3-1 for important details (e.g., distinctions between on-site and off-site receptors, different worker populations, different exposure pathways for a given receptor/medium combination). For example, "workers" in the table above is used to represent the on- and off-site "routine workers" in Table 3-1 and "construction" in the table above is used to represent the on- and off-site maintenance workers in Table 3-1.

The potential for current on-site and off-site human exposures to concentrations in groundwater,

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

surface water and sediment that are higher than the screening criteria discussed under Question 2 is discussed below.

Groundwater

Groundwater is not currently used as a potable or nonpotable water supply at the Site. In addition, as indicated on Table 3-1, the depth to ground water at the site is approximately 50 feet or greater below ground surface and below the depth of the deepest utilities, which precludes potential exposures to maintenance workers. The results of the well search identified one downgradient off-site well. Discussions with the Ohio Department of Health and the Hamilton County Department of Health in September 2015 verified that there are no records of this well being in use. In addition, a visit in October 2015 with a representative of USEPA to the parcel where the well was formerly located indicated that the property is currently a gravel pit with no residential structure present. Therefore, there is no active potable wells downgradient of the site. In addition, the off-site downgradient pore water piezometer sampling results indicate that groundwater contamination is not migrating from the Site. Therefore, a current exposure pathway to contamination via use of groundwater as a potable or nonpotable water supply does not currently exist at or around the Site.

Surface Water and Sediment

The on-site and off-site surface water and sediment locations are depicted on Figure 3. As indicated on Table 3-1, the on-site surface water and sediment locations consist of the historical debris area (AOI C) and the wastewater storage pond (within SWMU 22); the off-site location consists of the quarry pond (AOI B). Potential exposures to workers in the on-site locations are not reasonably expected due to the remote location of the historical debris area and the absence of worker contact with the wastewater storage pond. There are no current industrial activities within the off-site quarry pond and recreational use of the pond is prohibited. Therefore, as indicated on Table 3-1, potential exposure to on-site and off-site surface water and sediment locations is limited to trespassers. Although potential exposure to trespassers is possible at the Site, fencing, physical constraints and 24 hour security deter trespassing. Similarly, trespassing at the quarry pond is deterred by fencing, physical constraints and prosecution of unauthorized users. The significance of any potential exposure to trespassers is discussed below under Question 4.

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):

Surface Water and Sediment

As discussed under Question 2, surface water and sediment is identified as "contaminated" for the purposes of the CA725 determination based on comparison with drinking water criteria and USEPA Region 9 PRGs for soils under residential and industrial land use assumptions (USEPA 2004). The use of these criteria to identify "contaminated media" in response to Question 1 is overly conservative because "contamination" was identified based on exposure factors applicable to a resident or industrial worker; for a trespasser, which represent the only potentially complete pathway to a human receptor identified under Questions 3, potential exposures are expected to be lower. To provide a more realistic but still conservative assessment of potential exposure, risk estimates were derived for both an adolescent (ages 9 to 18) and adult trespasser based on the exposure factors provided on Table 4-1. For the purposes of this assessment, the highest concentration of each chemical detected in surface water and sediment at each area was conservatively used in the risk calculations. The cumulative cancer risk and noncancer hazard index (HI) estimates for a trespasser based on exposure to both sediment and surface water are provided on Table 4-2. Supporting information for the calculation of these risk estimates is provided as Appendix A.

As shown on Table 4-2, the cumulative cancer risk and HI estimates for each area are well below USEPA's limits of 10^{-4} and 1, respectively. Based on these estimates, no unacceptable exposure of trespassers to surface water or sediment is expected in on-site or off-site areas.

Summary

When the magnitude of potential exposures and current site-specific conditions are considered, the concentrations of constituents in the groundwater, surface water and sediment do not present a significant exposure. The significance of potential exposures under current conditions is evaluated by estimating upper-bound estimates of the cumulative cancer risk and HI for each contaminated medium with a

[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.

complete pathway for current human exposure and comparing them to USEPA-established levels for determining whether they are significant enough to warrant corrective measures under RCRA corrective action (USEPA 1991). The results of these risk calculations show that the RFI data collected at the Site support a determination that all current human exposures to “contamination” at or from the Site are under control.

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 **Bway Corporation**, facility,
EPA ID # OHD 004253_225,
Located at 8200 Broadwell Road Cincinnati, Ohio
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)	[signature]	Date	9/22/2016
	(print)	Juan Thomas		
	(title)	Environmental Scientist		

Supervisor	(signature)	[signature]	Date	10/6/16
	(print)	Gregory Rudloff		
	(title)	Acting Section Chief, RRB CA2		
	(EPA Region or State)	EPA Region 5		

Tables

Table 2-1a Soil Screening Results Summary
Table 2-1b Soil Samples Exceeding Screening Criteria
Table 2-2a Groundwater Screening Results Summary
Table 2-2b Groundwater Samples Exceeding the Screening Criteria
Table 2-3a Surface Water Screening Results Summary
Table 2-3b Surface Water Samples Exceeding the Screening Criteria
Table 2-4a Sediment Screening Results Summary
Table 2-4b Sediment Samples Exceeding the Screening Criteria
Table 3-1 Conceptual Site Model for Potential Human Exposures
Table 4-1 Exposure Factors – Hypothetical Trespassers
Table 4-2 Upper-Bound Cumulative Cancer Risk and HI Estimates for Trespasser Exposures

Figures

Figure 1 Bway Facility Location
Figure 2 Locations SWMUs, AOCs and AOIs
Figure 3 RFI Sampling Locations and Groundwater Contours

Appendix

Appendix A Supporting Information and Calculations
Appendix B Supplemental Groundwater Data Screening Results

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Appendix II
CA725 Environmental Indicators Supporting Documentation

Tables

Table 2-1a	Soil Screening Results Summary
Table 2-1b	Soil Samples Exceeding Screening Criteria
Table 2-2a	Groundwater Screening Results Summary
Table 2-2b	Groundwater Samples Exceeding the Screening Criteria
Table 2-3a	Surface Water Screening Results Summary
Table 2-3b	Surface Water Samples Exceeding the Screening Criteria
Table 2-4a	Sediment Screening Results Summary
Table 2-4b	Sediment Samples Exceeding the Screening Criteria
Table 3-1	Conceptual Site Model for Potential Human Exposures
Table 4-1	Exposure Factors – Hypothetical Trespassers
Table 4-2	Upper-Bound Cumulative Cancer Risk and HI Estimates for Trespasser Exposures

Figures

Figure 1	Bway Facility Location
Figure 2	Locations SWMUs, AOCs and AOIs
Figure 3	RFI Sampling Locations and Groundwater Contours

Appendix

Appendix A	Supporting Information and Calculations
Appendix B	Supplemental Groundwater Data Screening Results

Tables

Table 2-1a: Soil Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Site-Specific Background (mg/kg)	Maximum Exposure Conc (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Ratio of Max Detect to Industrial Soil Volatilization to Indoor Air Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	AOC A	VOC	Acetone	67-64-1	ID	16	1	6.80E-03	6.80E-03		6.80E-03	5.4E+04	NC	1.3E-07	1.7E+04	3.9E-07	1.4E+04	NC	4.8E-07
on	AOC A	VOC	Acetonitrile	75-05-8	D	16	2	6.20E-03	8.40E-03		8.40E-03	1.8E+03	NC	4.6E-06	3.1E+01	2.7E-04	4.2E+02	NC	2.0E-05
on	AOC A	VOC	Benzene	71-43-2	A	16	3	2.20E-04	4.10E-04		4.10E-04	1.4E+01	C	2.9E-05	2.6E-01	1.6E-03	6.4E+00	C	6.4E-05
on	AOC A	VOC	Ethyl Benzene	100-41-4	D	16	3	3.50E-04	6.60E-04		6.60E-04	7.4E+03	NC	8.9E-08	7.8E+01	8.5E-06	1.9E+03	NC	3.5E-07
on	AOC A	VOC	Methylene Chloride	75-09-2	B2	16	4	9.10E-04	4.50E-03		4.50E-03	2.1E+02	C	2.2E-05	4.3E+00	1.0E-03	9.1E+01	C	4.9E-05
on	AOC A	VOC	Styrene	100-42-5		16	5	8.20E-04	1.00E-03		1.00E-03	1.8E+04	NC	5.5E-08	4.5E+02	2.2E-06	4.4E+03	NC	2.3E-07
on	AOC A	VOC	Toluene	108-88-3	ID	16	12	3.10E-04	1.60E-03		1.60E-03	2.2E+03	NC	7.2E-07	3.6E+02	4.4E-06	6.6E+02	NC	2.4E-06
on	AOC A	VOC	Xylenes (total)	1330-20-7	ID	16	3	7.70E-04	1.60E-03		1.60E-03	9.0E+02	NC	1.8E-06	9.5E+00	1.7E-04	2.7E+02	NC	5.9E-06
on	AOC A	SVOC	Benzo(a)pyrene	50-32-8	B2	16	1	1.30E-02	1.30E-02		1.30E-02	2.1E+00	C	6.2E-03	1.3E+05	1.0E-07	6.2E-01	C	2.1E-02
on	AOC A	SVOC	Benzo(b)fluoranthene	205-99-2	B2	16	1	3.00E-02	3.00E-02		3.00E-02	2.1E+01	C	1.4E-03	1.4E+04	2.2E-06	6.2E+00	C	4.8E-03
on	AOC A	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	16	13	2.40E-02	2.60E+02		2.60E+02	1.2E+03	C	2.1E-01	4.2E+09	6.2E-08	3.5E+02	C	7.5E-01
on	AOC A	SVOC	Chrysene	218-01-9	B2	16	1	1.90E-02	1.90E-02		1.90E-02	2.1E+03	C	9.0E-06	4.8E+05	3.9E-08	6.2E+02	C	3.1E-05
on	AOC A	SVOC	Diethylphthalate	84-66-2	D	16	1	3.90E-02	3.90E-02		3.90E-02	4.9E+05	NC	7.9E-08	5.2E+06	7.5E-09	4.9E+04	NC	8.0E-07
on	AOC A	SVOC	Fluoranthene	206-44-0	D	16	1	1.90E-02	1.90E-02		1.90E-02	2.2E+04	NC	8.6E-07	2.6E+06	7.3E-09	2.3E+03	NC	8.3E-06
on	AOC A	SVOC	2-Methylnaphthalene	91-57-6	ID	16	1	4.00E-02	4.00E-02		4.00E-02	1.9E+02	NC	2.1E-04			5.6E+01	NC	7.2E-04
on	AOC A	SVOC	Naphthalene	91-20-3	C	16	1	1.80E-02	1.80E-02		1.80E-02	1.9E+02	NC	9.6E-05	2.3E+01	8.0E-04	5.6E+01	NC	3.2E-04
on	AOC A	SVOC	Phenanthrene	85-01-8	D	16	2	8.20E-03	1.60E-02		1.60E-02	2.9E+04	NC	5.5E-07	3.5E+05	4.5E-08	2.3E+03	NC	6.9E-06
on	AOC A	SVOC	Pyrene	129-00-0	NC	16	1	1.70E-02	1.70E-02		1.70E-02	2.9E+04	NC	5.8E-07	2.9E+06	5.8E-09	2.3E+03	NC	7.3E-06
on	AOC A	INORG	Aluminum	7429-90-5	ID	11	11	1.14E+03	7.81E+03		7.81E+03	9.2E+05	NC	8.5E-03			7.6E+04	NC	1.0E-01
on	AOC A	INORG	Antimony	7440-36-0		11	1	1.60E+00	1.60E+00		1.60E+00	4.1E+02	NC	3.9E-03			3.1E+01	NC	5.1E-02
on	AOC A	INORG	Arsenic	7440-38-2	A	11	11	2.30E+00	7.50E+00	1.30E+01		1.6E+01	C				3.9E+00	C	
on	AOC A	INORG	Barium	7440-39-3	NC	11	11	1.36E+01	5.35E+01	1.40E+02		6.7E+04	NC				5.4E+03	NC	
on	AOC A	INORG	Beryllium	7440-41-7	B1	11	8	4.90E-02	2.50E-01		2.50E-01	1.9E+03	NC	1.3E-04			1.5E+02	NC	1.6E-03
on	AOC A	INORG	Cadmium	7440-43-9	B1	11	11	9.60E-02	3.00E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	AOC A	INORG	Chromium III	16065-83-1	D	11	11	2.49E+00	1.72E+01		1.72E+01	1.5E+06	NC	1.1E-05			1.2E+05	NC	1.5E-04
on	AOC A	INORG	Chromium VI	18540-29-9	A	11	2	3.10E-01	6.10E-01		6.10E-01	2.5E+03	NC	2.4E-04			2.2E+02	NC	2.7E-03
on	AOC A	INORG	Cobalt	7440-48-4	LC	11	11	1.80E+00	5.20E+00		5.20E+00	1.3E+04	NC	3.9E-04			1.4E+03	NC	3.8E-03
on	AOC A	INORG	Copper	7440-50-8	D	11	11	5.30E+00	3.33E+01		3.33E+01	4.1E+04	NC	8.1E-04			3.1E+03	NC	1.1E-02
on	AOC A	INORG	Iron	7439-89-6	D	11	11	4.13E+03	1.51E+04	1.84E+04		3.1E+05	NC				2.3E+04	NC	
on	AOC A	INORG	Lead	7439-92-1	B2	11	11	2.00E+00	3.10E+01	3.70E+01		8.0E+02	NC				4.0E+02	NC	
on	AOC A	INORG	Manganese	7439-96-5	D	11	11	2.94E+02	5.91E+02	4.59E+02	1.32E+02	1.9E+04	NC	6.8E-03			1.8E+03	NC	7.5E-02
on	AOC A	INORG	Mercury	7439-97-6	D	11	2	2.40E-02	3.90E-02	1.30E-01		1.4E+01	NC		2.9E+01		3.7E+00	NC	
on	AOC A	INORG	Nickel	7440-02-0	A	11	11	4.00E+00	1.34E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	AOC A	INORG	Silver	7440-22-4	D	11	2	3.00E-01	3.90E-01		3.90E-01	5.1E+03	NC	7.6E-05			3.9E+02	NC	1.0E-03
on	AOC A	INORG	Thallium	7440-28-0		11	8	6.60E-01	1.20E+00		1.20E+00	6.7E+01	NC	1.8E-02			5.2E+00	NC	2.3E-01
on	AOC A	INORG	Vanadium	7440-62-2		11	11	4.50E+00	1.85E+01		1.85E+01	1.0E+03	NC	1.8E-02			7.8E+01	NC	2.4E-01
on	AOC A	INORG	Zinc	7440-66-6	ID	11	11	1.29E+01	7.18E+01	9.00E+01		3.1E+05	NC				2.3E+04	NC	
on	AOI C	VOC	Acetone	67-64-1	ID	6	5	9.60E-03	2.70E-01		2.70E-01	5.4E+04	NC	5.0E-06	1.7E+04	1.6E-05	1.4E+04	NC	1.9E-05
on	AOI C	VOC	2-Butanone	78-93-3	ID	6	5	4.00E-03	7.60E-02		7.60E-02	1.1E+05	NC	6.7E-07	1.8E+03	4.2E-05	2.2E+04	NC	3.4E-06
on	AOI C	VOC	Carbon Disulfide	75-15-0		6	2	1.90E-03	8.40E-03		8.40E-03	1.2E+03	NC	7.0E-06	5.1E+01	1.7E-04	3.6E+02	NC	2.4E-05
on	AOI C	VOC	Methylene Chloride	75-09-2	B2	6	2	8.80E-04	1.70E-03		1.70E-03	2.1E+02	C	8.3E-06	4.3E+00	3.9E-04	9.1E+01	C	1.9E-05
on	AOI C	VOC	Tetrachloroethene	127-18-4	C-B2	6	2	4.00E-03	4.00E-03		4.00E-03	1.3E+01	C	3.1E-04	6.6E-01	6.0E-03	4.8E+00	C	8.3E-04
on	AOI C	VOC	Toluene	108-88-3	ID	6	3	1.60E-03	1.60E-02		1.60E-02	2.2E+03	NC	7.2E-06	3.6E+02	4.4E-05	6.6E+02	NC	2.4E-05
on	AOI C	VOC	Trichloroethene	79-01-6	C-B2	6	1	3.40E-03	3.40E-03		3.40E-03	6.1E+01	C	5.6E-05	1.2E+00	2.8E-03	2.3E+01	NC	1.5E-04
on	AOI C	SVOC	Anthracene	120-12-7	D	6	1	2.20E-02	2.20E-02		2.20E-02	2.4E+05	NC	9.2E-08			2.2E+04	NC	1.0E-06
on	AOI C	SVOC	Benzo(a)anthracene	56-55-3	B2	6	4	6.00E-02	1.60E-01		1.60E-01	2.1E+01	C	7.6E-03	1.2E+05	1.3E-06	6.2E+00	C	2.6E-02

Table 2-1a: Soil Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Site-Specific Background (mg/kg)	Maximum Exposure Conc (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Ratio of Max Detect to Industrial Soil Volatilization to Indoor Air Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	AOI C	SVOC	Benzo(a)pyrene	50-32-8	B2	6	4	6.50E-02	1.60E-01		1.60E-01	2.1E+00	C	7.6E-02	1.3E+05	1.2E-06	6.2E-01	C	2.6E-01
on	AOI C	SVOC	Benzo(b)fluoranthene	205-99-2	B2	6	4	9.00E-02	2.50E-01		2.50E-01	2.1E+01	C	1.2E-02	1.4E+04	1.8E-05	6.2E+00	C	4.0E-02
on	AOI C	SVOC	Benzo(g,h,i)perylene	191-24-2	D	6	4	5.20E-02	1.30E-01		1.30E-01	2.9E+04	NC	4.5E-06	3.1E+10	4.2E-12	2.3E+03	NC	5.6E-05
on	AOI C	SVOC	Benzo(k)fluoranthene	207-08-9	B2	6	4	4.00E-02	1.30E-01		1.30E-01	2.1E+02	C	6.2E-04	2.0E+07	6.4E-09	6.2E+01	C	2.1E-03
on	AOI C	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	6	2	5.40E-02	3.10E-01		3.10E-01	1.2E+03	C	2.5E-04	4.2E+09	7.4E-11	3.5E+02	C	8.9E-04
on	AOI C	SVOC	Chrysene	218-01-9	B2	6	4	9.00E-02	2.10E-01		2.10E-01	2.1E+03	C	1.0E-04	4.8E+05	4.3E-07	6.2E+02	C	3.4E-04
on	AOI C	SVOC	Fluoranthene	206-44-0	D	6	4	1.60E-01	3.80E-01		3.80E-01	2.2E+04	NC	1.7E-05	2.6E+06	1.5E-07	2.3E+03	NC	1.7E-04
on	AOI C	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	6	4	4.10E-02	1.10E-01		1.10E-01	2.1E+01	C	5.2E-03	3.4E+06	3.3E-08	6.2E+00	C	1.8E-02
on	AOI C	SVOC	Methylphenol (total)	1319-77-3		6	1	6.80E-01	6.80E-01		6.80E-01	3.1E+03	NC	2.2E-04			3.1E+02	NC	2.2E-03
on	AOI C	SVOC	Phenanthrene	85-01-8	D	6	4	6.40E-02	1.60E-01		1.60E-01	2.9E+04	NC	5.5E-06	3.5E+05	4.5E-07	2.3E+03	NC	6.9E-05
on	AOI C	SVOC	Pyrene	129-00-0	NC	6	4	1.40E-01	3.20E-01		3.20E-01	2.9E+04	NC	1.1E-05	2.9E+06	1.1E-07	2.3E+03	NC	1.4E-04
on	AOI C	INORG	Aluminum	7429-90-5	ID	6	6	4.85E+03	7.91E+03		7.91E+03	9.2E+05	NC	8.6E-03			7.6E+04	NC	1.0E-01
on	AOI C	INORG	Arsenic	7440-38-2	A	6	6	1.20E+00	4.50E+00	1.30E+01		1.6E+01	C				3.9E+00	C	
on	AOI C	INORG	Barium	7440-39-3	NC	6	6	3.65E+01	8.23E+01	1.40E+02		6.7E+04	NC				5.4E+03	NC	
on	AOI C	INORG	Beryllium	7440-41-7	B1	6	6	2.30E-01	4.60E-01		4.60E-01	1.9E+03	NC	2.4E-04			1.5E+02	NC	3.0E-03
on	AOI C	INORG	Cadmium	7440-43-9	B1	6	6	2.10E-01	1.20E+00	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	AOI C	INORG	Chromium (total)	7440-47-3		6	6	7.30E+00	1.35E+01	2.20E+01		2.5E+03	NC				2.2E+02	NC	
on	AOI C	INORG	Cobalt	7440-48-4	LC	6	6	2.80E+00	6.20E+00		6.20E+00	1.3E+04	NC	4.7E-04			1.4E+03	NC	4.5E-03
on	AOI C	INORG	Copper	7440-50-8	D	6	6	1.38E+01	3.49E+01		3.49E+01	4.1E+04	NC	8.5E-04			3.1E+03	NC	1.1E-02
on	AOI C	INORG	Iron	7439-89-6	D	6	6	6.48E+03	1.57E+04	1.84E+04		3.1E+05	NC				2.3E+04	NC	
on	AOI C	INORG	Lead	7439-92-1	B2	6	6	9.60E+00	8.79E+01	3.70E+01	5.09E+01	8.0E+02	NC	6.4E-02			4.0E+02	NC	1.3E-01
on	AOI C	INORG	Manganese	7439-96-5	D	6	6	5.28E+01	1.62E+02	4.59E+02		1.9E+04	NC				1.8E+03	NC	
on	AOI C	INORG	Mercury	7439-97-6	D	6	6	2.40E-02	1.70E-01	1.30E-01	4.00E-02	1.4E+01	NC	2.9E-03	2.9E+01	1.4E-03	3.7E+00	NC	1.1E-02
on	AOI C	INORG	Nickel	7440-02-0	A	6	6	8.10E+00	1.65E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	AOI C	INORG	Selenium	7782-49-2	D	6	4	2.10E+00	4.10E+00		4.10E+00	5.1E+03	NC	8.0E-04			3.9E+02	NC	1.0E-02
on	AOI C	INORG	Vanadium	7440-62-2		6	6	1.14E+01	2.15E+01		2.15E+01	1.0E+03	NC	2.1E-02			7.8E+01	NC	2.7E-01
on	AOI C	INORG	Zinc	7440-66-6	ID	6	6	4.09E+01	1.13E+02	9.00E+01	2.30E+01	3.1E+05	NC	7.5E-05			2.3E+04	NC	9.8E-04
on	AOI D	VOC	Acetone	67-64-1	ID	19	1	1.00E-02	1.00E-02		1.00E-02	5.4E+04	NC	1.8E-07	1.7E+04	5.8E-07	1.4E+04	NC	7.1E-07
on	AOI D	VOC	Acetonitrile	75-05-8	D	19	5	3.50E-03	4.30E-03		4.30E-03	1.8E+03	NC	2.4E-06	3.1E+01	1.4E-04	4.2E+02	NC	1.0E-05
on	AOI D	VOC	Benzene	71-43-2	A	19	1	4.20E-04	4.20E-04		4.20E-04	1.4E+01	C	3.0E-05	2.6E-01	1.6E-03	6.4E+00	C	6.5E-05
on	AOI D	VOC	Ethyl Benzene	100-41-4	D	19	5	3.20E-04	6.50E-04		6.50E-04	7.4E+03	NC	8.8E-08	7.8E+01	8.4E-06	1.9E+03	NC	3.5E-07
on	AOI D	VOC	Methylene Chloride	75-09-2	B2	19	11	5.40E-03	7.30E-03		7.30E-03	2.1E+02	C	3.6E-05	4.3E+00	1.7E-03	9.1E+01	C	8.0E-05
on	AOI D	VOC	Tetrachloroethene	127-18-4	C-B2	19	1	5.60E-04	5.60E-04		5.60E-04	1.3E+01	C	4.3E-05	6.6E-01	8.4E-04	4.8E+00	C	1.2E-04
on	AOI D	VOC	Toluene	108-88-3	ID	19	15	2.70E-04	1.60E-03		1.60E-03	2.2E+03	NC	7.2E-07	3.6E+02	4.4E-06	6.6E+02	NC	2.4E-06
on	AOI D	VOC	Xylenes (total)	1330-20-7	ID	19	3	1.10E-03	1.20E-03		1.20E-03	9.0E+02	NC	1.3E-06	9.5E+00	1.3E-04	2.7E+02	NC	4.4E-06
on	AOI D	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	19	10	1.90E-02	1.20E+00		1.20E+00	1.2E+03	C	9.7E-04	4.2E+09	2.9E-10	3.5E+02	C	3.5E-03
on	AOI D	SVOC	Butylbenzylphthalate	85-68-7	C	19	1	3.20E-02	3.20E-02		3.20E-02	1.2E+05	NC	2.6E-07	7.6E+06	4.2E-09	1.2E+04	NC	2.6E-06
on	AOI D	SVOC	Di-n-butylphthalate	84-74-2	D	19	5	2.00E-02	4.50E-02		4.50E-02	6.2E+04	NC	7.3E-07			6.1E+03	NC	7.4E-06
on	AOI D	SVOC	Fluoranthene	206-44-0	D	19	1	1.80E-02	1.80E-02		1.80E-02	2.2E+04	NC	8.2E-07	2.6E+06	6.9E-09	2.3E+03	NC	7.8E-06
on	AOI D	SVOC	2-Methylnaphthalene	91-57-6	ID	19	1	8.70E-03	8.70E-03		8.70E-03	1.9E+02	NC	4.6E-05			5.6E+01	NC	1.6E-04
on	AOI D	SVOC	Naphthalene	91-20-3	C	19	1	8.50E-03	8.50E-03		8.50E-03	1.9E+02	NC	4.5E-05	2.3E+01	3.8E-04	5.6E+01	NC	1.5E-04
on	AOI D	SVOC	Phenanthrene	85-01-8	D	19	1	1.80E-02	1.80E-02		1.80E-02	2.9E+04	NC	6.2E-07	3.5E+05	5.1E-08	2.3E+03	NC	7.8E-06
on	AOI D	INORG	Aluminum	7429-90-5	ID	14	14	1.55E+03	9.60E+03		9.60E+03	9.2E+05	NC	1.0E-02			7.6E+04	NC	1.3E-01
on	AOI D	INORG	Antimony	7440-36-0		14	1	7.30E-01	7.30E-01		7.30E-01	4.1E+02	NC	1.8E-03			3.1E+01	NC	2.3E-02
on	AOI D	INORG	Arsenic	7440-38-2	A	14	14	2.50E+00	9.70E+00	1.30E+01		1.6E+01	C				3.9E+00	C	
on	AOI D	INORG	Barium	7440-39-3	NC	14	14	1.12E+01	6.81E+01	1.40E+02		6.7E+04	NC				5.4E+03	NC	

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Site-Specific Background (mg/kg)	Maximum Exposure Conc (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Ratio of Max Detect to Industrial Soil Volatilization to Indoor Air Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	AOI D	INORG	Beryllium	7440-41-7	B1	14	9	4.50E-02	3.20E-01		3.20E-01	1.9E+03	NC	1.6E-04			1.5E+02	NC	2.1E-03
on	AOI D	INORG	Cadmium	7440-43-9	B1	14	14	4.10E-02	1.30E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	AOI D	INORG	Chromium III	16065-83-1	D	14	14	2.95E+00	1.28E+01		1.28E+01	1.5E+06	NC	8.4E-06			1.2E+05	NC	1.1E-04
on	AOI D	INORG	Chromium VI	18540-29-9	A	14	7	2.50E-01	7.00E-01		7.00E-01	2.5E+03	NC	2.8E-04			2.2E+02	NC	3.1E-03
on	AOI D	INORG	Cobalt	7440-48-4	LC	14	14	2.00E+00	5.80E+00		5.80E+00	1.3E+04	NC	4.4E-04			1.4E+03	NC	4.2E-03
on	AOI D	INORG	Copper	7440-50-8	D	14	14	4.70E+00	1.41E+01		1.41E+01	4.1E+04	NC	3.4E-04			3.1E+03	NC	4.5E-03
on	AOI D	INORG	Iron	7439-89-6	D	14	14	4.96E+03	1.70E+04	1.84E+04		3.1E+05	NC				2.3E+04	NC	
on	AOI D	INORG	Lead	7439-92-1	B2	14	14	2.70E+00	9.20E+00	3.70E+01		8.0E+02	NC				4.0E+02	NC	
on	AOI D	INORG	Manganese	7439-96-5	D	14	14	2.52E+02	8.25E+02	4.59E+02	3.66E+02	1.9E+04	NC	1.9E-02			1.8E+03	NC	2.1E-01
on	AOI D	INORG	Mercury	7439-97-6	D	14	2	2.00E-02	2.30E-02	1.30E-01		1.4E+01	NC		2.9E+01		3.7E+00	NC	
on	AOI D	INORG	Nickel	7440-02-0	A	14	14	4.60E+00	1.30E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	AOI D	INORG	Thallium	7440-28-0		14	13	5.90E-01	1.40E+00		1.40E+00	6.7E+01	NC	2.1E-02			5.2E+00	NC	2.7E-01
on	AOI D	INORG	Vanadium	7440-62-2		14	14	5.20E+00	2.00E+01		2.00E+01	1.0E+03	NC	2.0E-02			7.8E+01	NC	2.6E-01
on	AOI D	INORG	Zinc	7440-66-6	ID	14	14	1.34E+01	2.45E+02	9.00E+01	1.55E+02	3.1E+05	NC	5.1E-04			2.3E+04	NC	6.6E-03
on	AOI E	VOC	Acetone	67-64-1	ID	27	4	6.80E-03	3.30E-02		3.30E-02	5.4E+04	NC	6.1E-07	1.7E+04	1.9E-06	1.4E+04	NC	2.3E-06
on	AOI E	VOC	Acetonitrile	75-05-8	D	27	12	3.40E-03	5.20E-03		5.20E-03	1.8E+03	NC	2.9E-06	3.1E+01	1.7E-04	4.2E+02	NC	1.2E-05
on	AOI E	VOC	Benzene	71-43-2	A	27	3	3.40E-04	4.90E-04		4.90E-04	1.4E+01	C	3.5E-05	2.6E-01	1.9E-03	6.4E+00	C	7.6E-05
on	AOI E	VOC	2-Butanone	78-93-3	ID	27	4	2.90E-03	7.20E-03		7.20E-03	1.1E+05	NC	6.4E-08	1.8E+03	4.0E-06	2.2E+04	NC	3.2E-07
on	AOI E	VOC	Carbon Disulfide	75-15-0		27	1	9.70E-04	9.70E-04		9.70E-04	1.2E+03	NC	8.1E-07	5.1E+01	1.9E-05	3.6E+02	NC	2.7E-06
on	AOI E	VOC	Ethyl Benzene	100-41-4	D	27	8	2.50E-04	7.30E-04		7.30E-04	7.4E+03	NC	9.8E-08	7.8E+01	9.4E-06	1.9E+03	NC	3.9E-07
on	AOI E	VOC	4-Methyl-2-pentanone	108-10-1	ID	27	1	1.50E-03	1.50E-03		1.50E-03	4.7E+04	NC	3.2E-08	6.7E+02	2.2E-06	5.3E+03	NC	2.8E-07
on	AOI E	VOC	Methylene Chloride	75-09-2	B2	27	16	1.90E-03	4.80E-03		4.80E-03	2.1E+02	C	2.3E-05	4.3E+00	1.1E-03	9.1E+01	C	5.3E-05
on	AOI E	VOC	Styrene	100-42-5		27	3	8.50E-04	1.00E-03		1.00E-03	1.8E+04	NC	5.5E-08	4.5E+02	2.2E-06	4.4E+03	NC	2.3E-07
on	AOI E	VOC	Tetrachloroethene	127-18-4	C-B2	27	1	2.00E-03	2.00E-03		2.00E-03	1.3E+01	C	1.5E-04	6.6E-01	3.0E-03	4.8E+00	C	4.1E-04
on	AOI E	VOC	Toluene	108-88-3	ID	27	17	2.50E-04	1.90E-03		1.90E-03	2.2E+03	NC	8.6E-07	3.6E+02	5.2E-06	6.6E+02	NC	2.9E-06
on	AOI E	VOC	Xylenes (total)	1330-20-7	ID	27	5	8.20E-04	1.40E-03		1.40E-03	9.0E+02	NC	1.6E-06	9.5E+00	1.5E-04	2.7E+02	NC	5.2E-06
on	AOI E	SVOC	Aniline	62-53-3	B2	27	5	2.40E-02	1.00E-01		1.00E-01	3.0E+03	C	3.3E-05	4.0E+01	2.5E-03	4.3E+02	NC	2.3E-04
on	AOI E	SVOC	Benzo(a)anthracene	56-55-3	B2	27	2	1.10E-02	1.30E-02		1.30E-02	2.1E+01	C	6.2E-04	1.2E+05	1.1E-07	6.2E+00	C	2.1E-03
on	AOI E	SVOC	Benzo(a)pyrene	50-32-8	B2	27	2	1.40E-02	1.50E-02		1.50E-02	2.1E+00	C	7.1E-03	1.3E+05	1.2E-07	6.2E-01	C	2.4E-02
on	AOI E	SVOC	Benzo(b)fluoranthene	205-99-2	B2	27	2	2.40E-02	2.60E-02		2.60E-02	2.1E+01	C	1.2E-03	1.4E+04	1.9E-06	6.2E+00	C	4.2E-03
on	AOI E	SVOC	Benzo(g,h,i)perylene	191-24-2	D	27	3	7.30E-03	1.40E-02		1.40E-02	2.9E+04	NC	4.8E-07	3.1E+10	4.5E-13	2.3E+03	NC	6.0E-06
on	AOI E	SVOC	Benzo(k)fluoranthene	207-08-9	B2	27	2	8.70E-03	9.90E-03		9.90E-03	2.1E+02	C	4.7E-05	2.0E+07	4.9E-10	6.2E+01	C	1.6E-04
on	AOI E	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	27	23	1.90E-02	1.60E+00		1.60E+00	1.2E+03	C	1.3E-03	4.2E+09	3.8E-10	3.5E+02	C	4.6E-03
on	AOI E	SVOC	Chrysene	218-01-9	B2	27	2	1.50E-02	1.80E-02		1.80E-02	2.1E+03	C	8.5E-06	4.8E+05	3.7E-08	6.2E+02	C	2.9E-05
on	AOI E	SVOC	Di-n-butylphthalate	84-74-2	D	27	5	2.10E-02	2.50E-02		2.50E-02	6.2E+04	NC	4.1E-07			6.1E+03	NC	4.1E-06
on	AOI E	SVOC	Fluoranthene	206-44-0	D	27	2	2.50E-02	2.80E-02		2.80E-02	2.2E+04	NC	1.3E-06	2.6E+06	1.1E-08	2.3E+03	NC	1.2E-05
on	AOI E	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	27	1	1.00E-02	1.00E-02		1.00E-02	2.1E+01	C	4.7E-04	3.4E+06	3.0E-09	6.2E+00	C	1.6E-03
on	AOI E	SVOC	Isophorone	78-59-1	C	27	1	9.90E-02	9.90E-02		9.90E-02	5.1E+03	C	1.9E-05			5.1E+03	C	1.9E-05
on	AOI E	SVOC	Phenanthrene	85-01-8	D	27	3	8.10E-03	1.50E-02		1.50E-02	2.9E+04	NC	5.2E-07	3.5E+05	4.3E-08	2.3E+03	NC	6.5E-06
on	AOI E	SVOC	Pyrene	129-00-0	NC	27	6	7.50E-03	4.30E-02		4.30E-02	2.9E+04	NC	1.5E-06	2.9E+06	1.5E-08	2.3E+03	NC	1.9E-05
on	AOI E	INORG	Aluminum	7429-90-5	ID	19	19	1.14E+03	8.07E+03		8.07E+03	9.2E+05	NC	8.8E-03			7.6E+04	NC	1.1E-01
on	AOI E	INORG	Arsenic	7440-38-2	A	19	19	2.30E+00	6.80E+00	1.30E+01		1.6E+01	C				3.9E+00	C	
on	AOI E	INORG	Barium	7440-39-3	NC	19	19	1.10E+01	1.26E+02	1.40E+02		6.7E+04	NC				5.4E+03	NC	
on	AOI E	INORG	Beryllium	7440-41-7	B1	19	9	4.60E-02	2.40E-01		2.40E-01	1.9E+03	NC	1.2E-04			1.5E+02	NC	1.6E-03
on	AOI E	INORG	Cadmium	7440-43-9	B1	19	19	6.40E-02	1.40E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	AOI E	INORG	Chromium III	16065-83-1	D	19	19	2.51E+00	1.25E+01		1.25E+01	1.5E+06	NC	8.2E-06			1.2E+05	NC	1.1E-04

Table 2-1a: Soil Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Site-Specific Background (mg/kg)	Maximum Exposure Conc (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Ratio of Max Detect to Industrial Soil Volatilization to Indoor Air Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	AOI E	INORG	Chromium VI	18540-29-9	A	19	12	2.40E-01	9.00E-01		9.00E-01	2.5E+03	NC	3.5E-04			2.2E+02	NC	4.0E-03
on	AOI E	INORG	Cobalt	7440-48-4	LC	19	19	1.50E+00	5.50E+00		5.50E+00	1.3E+04	NC	4.1E-04			1.4E+03	NC	4.0E-03
on	AOI E	INORG	Copper	7440-50-8	D	19	19	4.80E+00	2.07E+01		2.07E+01	4.1E+04	NC	5.1E-04			3.1E+03	NC	6.6E-03
on	AOI E	INORG	Iron	7439-89-6	D	19	19	3.89E+03	1.38E+04	1.84E+04		3.1E+05	NC				2.3E+04	NC	
on	AOI E	INORG	Lead	7439-92-1	B2	19	19	2.50E+00	1.94E+01	3.70E+01		8.0E+02	NC				4.0E+02	NC	
on	AOI E	INORG	Manganese	7439-96-5	D	19	19	2.83E+02	8.49E+02	4.59E+02	3.90E+02	1.9E+04	NC	2.0E-02			1.8E+03	NC	2.2E-01
on	AOI E	INORG	Mercury	7439-97-6	D	19	1	1.80E-02	1.80E-02	1.30E-01		1.4E+01	NC		2.9E+01		3.7E+00	NC	
on	AOI E	INORG	Nickel	7440-02-0	A	19	19	3.50E+00	1.08E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	AOI E	INORG	Thallium	7440-28-0		19	16	7.20E-01	1.50E+00		1.50E+00	6.7E+01	NC	2.2E-02			5.2E+00	NC	2.9E-01
on	AOI E	INORG	Vanadium	7440-62-2		19	19	3.90E+00	1.93E+01		1.93E+01	1.0E+03	NC	1.9E-02			7.8E+01	NC	2.5E-01
on	AOI E	INORG	Zinc	7440-66-6	ID	19	19	1.47E+01	4.39E+01	9.00E+01		3.1E+05	NC				2.3E+04	NC	
on	AOI G	VOC	Acetone	67-64-1	ID	10	1	7.70E-03	7.70E-03		7.70E-03	5.4E+04	NC	1.4E-07	1.7E+04	4.5E-07	1.4E+04	NC	5.5E-07
on	AOI G	VOC	Acetonitrile	75-05-8	D	10	2	3.90E-03	4.90E-03		4.90E-03	1.8E+03	NC	2.7E-06	3.1E+01	1.6E-04	4.2E+02	NC	1.2E-05
on	AOI G	VOC	Benzene	71-43-2	A	10	3	2.50E-04	2.90E-04		2.90E-04	1.4E+01	C	2.1E-05	2.6E-01	1.1E-03	6.4E+00	C	4.5E-05
on	AOI G	VOC	Ethyl Benzene	100-41-4	D	10	5	2.90E-04	8.20E-04		8.20E-04	7.4E+03	NC	1.1E-07	7.8E+01	1.1E-05	1.9E+03	NC	4.4E-07
on	AOI G	VOC	Tetrachloroethene	127-18-4	C-B2	10	8	1.00E-03	3.90E-03		3.90E-03	1.3E+01	C	3.0E-04	6.6E-01	5.9E-03	4.8E+00	C	8.1E-04
on	AOI G	VOC	Toluene	108-88-3	ID	10	10	3.10E-04	1.20E-03		1.20E-03	2.2E+03	NC	5.4E-07	3.6E+02	3.3E-06	6.6E+02	NC	1.8E-06
on	AOI G	VOC	Trichloroethene	79-01-6	C-B2	10	1	5.40E-04	5.40E-04		5.40E-04	6.1E+01	C	8.8E-06	1.2E+00	4.5E-04	2.3E+01	NC	2.3E-05
on	AOI G	VOC	Xylenes (total)	1330-20-7	ID	10	4	9.00E-04	1.60E-03		1.60E-03	9.0E+02	NC	1.8E-06	9.5E+00	1.7E-04	2.7E+02	NC	5.9E-06
on	AOI G	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	10	7	3.20E-02	1.70E-01		1.70E-01	1.2E+03	C	1.4E-04	4.2E+09	4.1E-11	3.5E+02	C	4.9E-04
on	AOI G	INORG	Aluminum	7429-90-5	ID	8	8	1.66E+03	2.79E+03		2.79E+03	9.2E+05	NC	3.0E-03			7.6E+04	NC	3.7E-02
on	AOI G	INORG	Arsenic	7440-38-2	A	8	8	2.70E+00	6.60E+00	1.30E+01		1.6E+01	C				3.9E+00	C	
on	AOI G	INORG	Barium	7440-39-3	NC	8	8	1.11E+01	2.84E+01	1.40E+02		6.7E+04	NC				5.4E+03	NC	
on	AOI G	INORG	Beryllium	7440-41-7	B1	8	4	5.90E-02	2.10E-01		2.10E-01	1.9E+03	NC	1.1E-04			1.5E+02	NC	1.4E-03
on	AOI G	INORG	Cadmium	7440-43-9	B1	8	8	5.30E-02	1.00E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	AOI G	INORG	Chromium III	16065-83-1	D	8	8	3.34E+00	5.45E+00		5.45E+00	1.5E+06	NC	3.6E-06			1.2E+05	NC	4.6E-05
on	AOI G	INORG	Chromium VI	18540-29-9	A	8	4	2.20E-01	3.60E-01		3.60E-01	2.5E+03	NC	1.4E-04			2.2E+02	NC	1.6E-03
on	AOI G	INORG	Cobalt	7440-48-4	LC	8	8	2.30E+00	3.60E+00		3.60E+00	1.3E+04	NC	2.7E-04			1.4E+03	NC	2.6E-03
on	AOI G	INORG	Copper	7440-50-8	D	8	8	5.50E+00	1.28E+01		1.28E+01	4.1E+04	NC	3.1E-04			3.1E+03	NC	4.1E-03
on	AOI G	INORG	Iron	7439-89-6	D	8	8	5.01E+03	8.89E+03	1.84E+04		3.1E+05	NC				2.3E+04	NC	
on	AOI G	INORG	Lead	7439-92-1	B2	8	8	2.60E+00	5.90E+00	3.70E+01		8.0E+02	NC				4.0E+02	NC	
on	AOI G	INORG	Manganese	7439-96-5	D	8	8	3.51E+02	6.94E+02	4.59E+02	2.35E+02	1.9E+04	NC	1.2E-02			1.8E+03	NC	1.3E-01
on	AOI G	INORG	Nickel	7440-02-0	A	8	8	4.90E+00	8.80E+00	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	AOI G	INORG	Silver	7440-22-4	D	8	1	1.00E-01	1.00E-01		1.00E-01	5.1E+03	NC	2.0E-05			3.9E+02	NC	2.6E-04
on	AOI G	INORG	Thallium	7440-28-0		8	6	8.20E-01	1.00E+00		1.00E+00	6.7E+01	NC	1.5E-02			5.2E+00	NC	1.9E-01
on	AOI G	INORG	Vanadium	7440-62-2		8	8	5.20E+00	8.40E+00		8.40E+00	1.0E+03	NC	8.2E-03			7.8E+01	NC	1.1E-01
on	AOI G	INORG	Zinc	7440-66-6	ID	8	8	1.58E+01	3.11E+01	9.00E+01		3.1E+05	NC				2.3E+04	NC	
on	SWMU 10	VOC	Acetone	67-64-1	ID	19	1	7.10E-03	7.10E-03		7.10E-03	5.4E+04	NC	1.3E-07	1.7E+04	4.1E-07	1.4E+04	NC	5.0E-07
on	SWMU 10	VOC	Benzene	71-43-2	A	19	1	3.60E-04	3.60E-04		3.60E-04	1.4E+01	C	2.6E-05	2.6E-01	1.4E-03	6.4E+00	C	5.6E-05
on	SWMU 10	VOC	Ethyl Benzene	100-41-4	D	19	2	2.40E-04	2.80E-04		2.80E-04	7.4E+03	NC	3.8E-08	7.8E+01	3.6E-06	1.9E+03	NC	1.5E-07
on	SWMU 10	VOC	Toluene	108-88-3	ID	19	4	5.20E-04	6.50E-04		6.50E-04	2.2E+03	NC	2.9E-07	3.6E+02	1.8E-06	6.6E+02	NC	9.9E-07
on	SWMU 10	SVOC	Anthracene	120-12-7	D	19	2	1.00E-02	1.60E-02		1.60E-02	2.4E+05	NC	6.7E-08			2.2E+04	NC	7.3E-07
on	SWMU 10	SVOC	Aramite (total)	140-57-8	B2	19	1	2.20E-02	2.20E-02		2.20E-02	6.9E+02	C	3.2E-05	2.9E+07	7.5E-10	1.9E+02	C	1.1E-04
on	SWMU 10	SVOC	Benzo(a)anthracene	56-55-3	B2	19	3	3.00E-02	4.80E-02		4.80E-02	2.1E+01	C	2.3E-03	1.2E+05	3.9E-07	6.2E+00	C	7.7E-03
on	SWMU 10	SVOC	Benzo(a)pyrene	50-32-8	B2	19	5	1.00E-02	6.80E-02		6.80E-02	2.1E+00	C	3.2E-02	1.3E+05	5.3E-07	6.2E-01	C	1.1E-01
on	SWMU 10	SVOC	Benzo(b)fluoranthene	205-99-2	B2	19	5	2.50E-02	1.50E-01		1.50E-01	2.1E+01	C	7.1E-03	1.4E+04	1.1E-05	6.2E+00	C	2.4E-02

Table 2-1a: Soil Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Site-Specific Background (mg/kg)	Maximum Exposure Conc (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Ratio of Max Detect to Industrial Soil Volatilization to Indoor Air Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	SWMU 10	SVOC	Benzo(g,h,i)perylene	191-24-2	D	19	4	1.50E-02	9.90E-02		9.90E-02	2.9E+04	NC	3.4E-06	3.1E+10	3.2E-12	2.3E+03	NC	4.3E-05
on	SWMU 10	SVOC	Benzo(k)fluoranthene	207-08-9	B2	19	3	4.00E-02	5.30E-02		5.30E-02	2.1E+02	C	2.5E-04	2.0E+07	2.6E-09	6.2E+01	C	8.5E-04
on	SWMU 10	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	19	19	3.20E-02	2.40E+02		2.40E+02	1.2E+03	C	1.9E-01	4.2E+09	5.7E-08	3.5E+02	C	6.9E-01
on	SWMU 10	SVOC	Chrysene	218-01-9	B2	19	4	2.20E-02	7.50E-02		7.50E-02	2.1E+03	C	3.6E-05	4.8E+05	1.5E-07	6.2E+02	C	1.2E-04
on	SWMU 10	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	19	1	1.10E-02	1.10E-02		1.10E-02	2.1E+00	C	5.2E-03	1.0E+08	1.1E-10	6.2E-01	C	1.8E-02
on	SWMU 10	SVOC	Fluoranthene	206-44-0	D	19	5	9.00E-03	1.00E-01		1.00E-01	2.2E+04	NC	4.5E-06	2.6E+06	3.8E-08	2.3E+03	NC	4.4E-05
on	SWMU 10	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	19	4	8.70E-03	7.40E-02		7.40E-02	2.1E+01	C	3.5E-03	3.4E+06	2.2E-08	6.2E+00	C	1.2E-02
on	SWMU 10	SVOC	2-Methylnaphthalene	91-57-6	ID	19	3	9.30E-03	5.00E-02		5.00E-02	1.9E+02	NC	2.7E-04			5.6E+01	NC	8.9E-04
on	SWMU 10	SVOC	Naphthalene	91-20-3	C	19	2	7.90E-03	3.00E-02		3.00E-02	1.9E+02	NC	1.6E-04	2.3E+01	1.3E-03	5.6E+01	NC	5.4E-04
on	SWMU 10	SVOC	Phenanthrene	85-01-8	D	19	5	1.30E-02	4.50E-02		4.50E-02	2.9E+04	NC	1.5E-06	3.5E+05	1.3E-07	2.3E+03	NC	1.9E-05
on	SWMU 10	SVOC	Pyrene	129-00-0	NC	19	5	7.60E-03	7.50E-02		7.50E-02	2.9E+04	NC	2.6E-06	2.9E+06	2.6E-08	2.3E+03	NC	3.2E-05
on	SWMU 10	INORG	Aluminum	7429-90-5	ID	13	13	1.34E+03	9.70E+03		9.70E+03	9.2E+05	NC	1.1E-02			7.6E+04	NC	1.3E-01
on	SWMU 10	INORG	Antimony	7440-36-0		13	1	4.70E-01	4.70E-01		4.70E-01	4.1E+02	NC	1.1E-03			3.1E+01	NC	1.5E-02
on	SWMU 10	INORG	Arsenic	7440-38-2	A	13	13	3.30E+00	1.08E+01	1.30E+01		1.6E+01	C				3.9E+00	C	
on	SWMU 10	INORG	Barium	7440-39-3	NC	13	13	1.18E+01	1.10E+02	1.40E+02		6.7E+04	NC				5.4E+03	NC	
on	SWMU 10	INORG	Beryllium	7440-41-7	B1	13	12	4.60E-02	3.80E-01		3.80E-01	1.9E+03	NC	2.0E-04			1.5E+02	NC	2.5E-03
on	SWMU 10	INORG	Cadmium	7440-43-9	B1	13	13	4.40E-02	4.70E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	SWMU 10	INORG	Chromium III	16065-83-1	D	13	13	3.39E+00	1.49E+01		1.49E+01	1.5E+06	NC	9.8E-06			1.2E+05	NC	1.3E-04
on	SWMU 10	INORG	Chromium VI	18540-29-9	A	13	8	4.30E-01	4.10E+00		4.10E+00	2.5E+03	NC	1.6E-03			2.2E+02	NC	1.8E-02
on	SWMU 10	INORG	Cobalt	7440-48-4	LC	13	13	2.10E+00	7.80E+00		7.80E+00	1.3E+04	NC	5.9E-04			1.4E+03	NC	5.7E-03
on	SWMU 10	INORG	Copper	7440-50-8	D	13	13	4.80E+00	2.45E+01		2.45E+01	4.1E+04	NC	6.0E-04			3.1E+03	NC	7.8E-03
on	SWMU 10	INORG	Iron	7439-89-6	D	13	13	5.40E+03	1.85E+04	1.84E+04	1.00E+02	3.1E+05	NC	3.3E-04			2.3E+04	NC	4.3E-03
on	SWMU 10	INORG	Lead	7439-92-1	B2	13	13	2.70E+00	3.68E+01	3.70E+01		8.0E+02	NC				4.0E+02	NC	
on	SWMU 10	INORG	Manganese	7439-96-5	D	13	13	3.45E+02	1.68E+03	4.59E+02	1.22E+03	1.9E+04	NC	6.3E-02			1.8E+03	NC	6.9E-01
on	SWMU 10	INORG	Mercury	7439-97-6	D	13	5	1.80E-02	4.40E-02	1.30E-01		1.4E+01	NC		2.9E+01		3.7E+00	NC	
on	SWMU 10	INORG	Nickel	7440-02-0	A	13	13	4.50E+00	1.56E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	SWMU 10	INORG	Silver	7440-22-4	D	13	3	9.20E-01	5.70E+00		5.70E+00	5.1E+03	NC	1.1E-03			3.9E+02	NC	1.5E-02
on	SWMU 10	INORG	Thallium	7440-28-0		13	12	6.60E-01	1.80E+00		1.80E+00	6.7E+01	NC	2.7E-02			5.2E+00	NC	3.5E-01
on	SWMU 10	INORG	Vanadium	7440-62-2		13	13	5.20E+00	2.17E+01		2.17E+01	1.0E+03	NC	2.1E-02			7.8E+01	NC	2.8E-01
on	SWMU 10	INORG	Zinc	7440-66-6	ID	13	13	1.31E+01	1.09E+02	9.00E+01	1.90E+01	3.1E+05	NC	6.2E-05			2.3E+04	NC	8.1E-04
on	SWMU 11	VOC	Acetone	67-64-1	ID	52	10	5.00E-03	2.10E-02		2.10E-02	5.4E+04	NC	3.9E-07	1.7E+04	1.2E-06	1.4E+04	NC	1.5E-06
on	SWMU 11	VOC	Acetonitrile	75-05-8	D	52	1	7.50E-03	7.50E-03		7.50E-03	1.8E+03	NC	4.1E-06	3.1E+01	2.4E-04	4.2E+02	NC	1.8E-05
on	SWMU 11	VOC	Benzene	71-43-2	A	52	5	2.10E-04	4.40E-04		4.40E-04	1.4E+01	C	3.1E-05	2.6E-01	1.7E-03	6.4E+00	C	6.8E-05
on	SWMU 11	VOC	2-Butanone	78-93-3	ID	52	2	1.20E-03	4.60E-03		4.60E-03	1.1E+05	NC	4.1E-08	1.8E+03	2.6E-06	2.2E+04	NC	2.1E-07
on	SWMU 11	VOC	Ethyl Benzene	100-41-4	D	52	5	2.80E-04	6.60E-04		6.60E-04	7.4E+03	NC	8.9E-08	7.8E+01	8.5E-06	1.9E+03	NC	3.5E-07
on	SWMU 11	VOC	4-Methyl-2-pentanone	108-10-1	ID	52	3	5.70E-04	7.40E-03		7.40E-03	4.7E+04	NC	1.6E-07	6.7E+02	1.1E-05	5.3E+03	NC	1.4E-06
on	SWMU 11	VOC	Methylene Chloride	75-09-2	B2	52	14	9.00E-04	4.20E-03		4.20E-03	2.1E+02	C	2.0E-05	4.3E+00	9.7E-04	9.1E+01	C	4.6E-05
on	SWMU 11	VOC	Tetrachloroethene	127-18-4	C-B2	52	16	5.40E-04	8.10E-01		8.10E-01	1.3E+01	C	6.2E-02	6.6E-01	**1.2E+00**	4.8E+00	C	1.7E-01
on	SWMU 11	VOC	Toluene	108-88-3	ID	52	23	3.00E-04	2.00E-03		2.00E-03	2.2E+03	NC	9.0E-07	3.6E+02	5.5E-06	6.6E+02	NC	3.0E-06
on	SWMU 11	VOC	Trichloroethene	79-01-6	C-B2	52	10	3.70E-04	4.20E-02		4.20E-02	6.1E+01	C	6.9E-04	1.2E+00	3.5E-02	2.3E+01	NC	1.8E-03
on	SWMU 11	VOC	Xylenes (total)	1330-20-7	ID	52	5	8.10E-04	3.90E-03		3.90E-03	9.0E+02	NC	4.3E-06	9.5E+00	4.1E-04	2.7E+02	NC	1.4E-05
on	SWMU 11	SVOC	Benzo(a)anthracene	56-55-3	B2	36	1	2.10E-02	2.10E-02		2.10E-02	2.1E+01	C	1.0E-03	1.2E+05	1.7E-07	6.2E+00	C	3.4E-03
on	SWMU 11	SVOC	Benzo(a)pyrene	50-32-8	B2	36	3	8.90E-03	2.50E-02		2.50E-02	2.1E+00	C	1.2E-02	1.3E+05	1.9E-07	6.2E-01	C	4.0E-02
on	SWMU 11	SVOC	Benzo(b)fluoranthene	205-99-2	B2	36	5	1.30E-02	4.70E-02		4.70E-02	2.1E+01	C	2.2E-03	1.4E+04	3.4E-06	6.2E+00	C	7.6E-03
on	SWMU 11	SVOC	Benzo(g,h,i)perylene	191-24-2	D	36	2	1.10E-02	6.90E-02		6.90E-02	2.9E+04	NC	2.4E-06	3.1E+10	2.2E-12	2.3E+03	NC	3.0E-05
on	SWMU 11	SVOC	Benzo(k)fluoranthene	207-08-9	B2	36	2	7.90E-03	1.80E-02		1.80E-02	2.1E+02	C	8.5E-05	2.0E+07	8.9E-10	6.2E+01	C	2.9E-04

Table 2-1a: Soil Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Site-Specific Background (mg/kg)	Maximum Exposure Conc (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Ratio of Max Detect to Industrial Soil Volatilization to Indoor Air Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	SWMU 11	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	36	33	2.40E-02	2.30E+02		2.30E+02	1.2E+03	C	1.9E-01	4.2E+09	5.5E-08	3.5E+02	C	6.6E-01
on	SWMU 11	SVOC	Chrysene	218-01-9	B2	36	5	8.20E-03	5.40E-02		5.40E-02	2.1E+03	C	2.6E-05	4.8E+05	1.1E-07	6.2E+02	C	8.7E-05
on	SWMU 11	SVOC	Dibenzofuran	132-64-9	D	36	1	4.00E-02	4.00E-02		4.00E-02	1.6E+03	NC	2.6E-05			1.5E+02	NC	2.8E-04
on	SWMU 11	SVOC	Fluoranthene	206-44-0	D	36	7	1.50E-02	5.90E-02		5.90E-02	2.2E+04	NC	2.7E-06	2.6E+06	2.3E-08	2.3E+03	NC	2.6E-05
on	SWMU 11	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	36	1	1.90E-02	1.90E-02		1.90E-02	2.1E+01	C	9.0E-04	3.4E+06	5.7E-09	6.2E+00	C	3.1E-03
on	SWMU 11	SVOC	2-Methylnaphthalene	91-57-6	ID	36	3	3.20E-02	2.00E-01		2.00E-01	1.9E+02	NC	1.1E-03			5.6E+01	NC	3.6E-03
on	SWMU 11	SVOC	Naphthalene	91-20-3	C	36	2	5.80E-02	7.80E-02		7.80E-02	1.9E+02	NC	4.2E-04	2.3E+01	3.4E-03	5.6E+01	NC	1.4E-03
on	SWMU 11	SVOC	Phenanthrene	85-01-8	D	36	4	9.60E-03	1.90E-01		1.90E-01	2.9E+04	NC	6.5E-06	3.5E+05	5.4E-07	2.3E+03	NC	8.2E-05
on	SWMU 11	SVOC	Pyrene	129-00-0	NC	36	7	1.00E-02	5.00E-02		5.00E-02	2.9E+04	NC	1.7E-06	2.9E+06	1.7E-08	2.3E+03	NC	2.2E-05
on	SWMU 11	INORG	Aluminum	7429-90-5	ID	25	25	1.24E+03	1.20E+04		1.20E+04	9.2E+05	NC	1.3E-02			7.6E+04	NC	1.6E-01
on	SWMU 11	INORG	Antimony	7440-36-0		25	1	8.00E-01	8.00E-01		8.00E-01	4.1E+02	NC	2.0E-03			3.1E+01	NC	2.6E-02
on	SWMU 11	INORG	Arsenic	7440-38-2	A	25	25	2.20E+00	8.50E+00	1.30E+01		1.6E+01	C				3.9E+00	C	
on	SWMU 11	INORG	Barium	7440-39-3	NC	25	25	8.80E+00	5.32E+01	1.40E+02		6.7E+04	NC				5.4E+03	NC	
on	SWMU 11	INORG	Beryllium	7440-41-7	B1	25	16	5.20E-02	2.80E-01		2.80E-01	1.9E+03	NC	1.4E-04			1.5E+02	NC	1.8E-03
on	SWMU 11	INORG	Cadmium	7440-43-9	B1	25	25	6.40E-02	4.60E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	SWMU 11	INORG	Chromium III	16065-83-1	D	25	25	2.90E+00	1.22E+02		1.22E+02	1.5E+06	NC	8.0E-05			1.2E+05	NC	1.0E-03
on	SWMU 11	INORG	Chromium VI	18540-29-9	A	25	14	2.50E-01	1.60E+00		1.60E+00	2.5E+03	NC	6.3E-04			2.2E+02	NC	7.2E-03
on	SWMU 11	INORG	Cobalt	7440-48-4	LC	25	25	1.40E+00	5.40E+00		5.40E+00	1.3E+04	NC	4.1E-04			1.4E+03	NC	3.9E-03
on	SWMU 11	INORG	Copper	7440-50-8	D	25	25	4.40E+00	1.38E+01		1.38E+01	4.1E+04	NC	3.4E-04			3.1E+03	NC	4.4E-03
on	SWMU 11	INORG	Iron	7439-89-6	D	25	25	4.88E+03	2.54E+04	1.84E+04	7.00E+03	3.1E+05	NC	2.3E-02			2.3E+04	NC	3.0E-01
on	SWMU 11	INORG	Lead	7439-92-1	B2	25	25	1.90E+00	5.47E+01	3.70E+01	1.77E+01	8.0E+02	NC	2.2E-02			4.0E+02	NC	4.4E-02
on	SWMU 11	INORG	Manganese	7439-96-5	D	25	25	2.44E+02	7.97E+02	4.59E+02	3.38E+02	1.9E+04	NC	1.7E-02			1.8E+03	NC	1.9E-01
on	SWMU 11	INORG	Mercury	7439-97-6	D	25	12	1.60E-02	4.90E-02	1.30E-01		1.4E+01	NC		2.9E+01		3.7E+00	NC	
on	SWMU 11	INORG	Nickel	7440-02-0	A	25	25	4.00E+00	1.28E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	SWMU 11	INORG	Silver	7440-22-4	D	25	1	1.60E-01	1.60E-01		1.60E-01	5.1E+03	NC	3.1E-05			3.9E+02	NC	4.1E-04
on	SWMU 11	INORG	Thallium	7440-28-0		25	16	5.90E-01	1.20E+00		1.20E+00	6.7E+01	NC	1.8E-02			5.2E+00	NC	2.3E-01
on	SWMU 11	INORG	Vanadium	7440-62-2		25	25	4.90E+00	2.54E+01		2.54E+01	1.0E+03	NC	2.5E-02			7.8E+01	NC	3.2E-01
on	SWMU 11	INORG	Zinc	7440-66-6	ID	25	25	1.36E+01	2.72E+02	9.00E+01	1.82E+02	3.1E+05	NC	5.9E-04			2.3E+04	NC	7.8E-03
on	SWMU 12	VOC	Acetone	67-64-1	ID	16	4	6.20E-03	1.70E-02		1.70E-02	5.4E+04	NC	3.1E-07	1.7E+04	9.8E-07	1.4E+04	NC	1.2E-06
on	SWMU 12	VOC	Acetonitrile	75-05-8	D	16	12	5.70E-03	8.80E-03		8.80E-03	1.8E+03	NC	4.8E-06	3.1E+01	2.8E-04	4.2E+02	NC	2.1E-05
on	SWMU 12	VOC	Benzene	71-43-2	A	16	3	2.50E-04	4.10E-04		4.10E-04	1.4E+01	C	2.9E-05	2.6E-01	1.6E-03	6.4E+00	C	6.4E-05
on	SWMU 12	VOC	2-Butanone	78-93-3	ID	16	2	1.40E-03	1.90E-03		1.90E-03	1.1E+05	NC	1.7E-08	1.8E+03	1.1E-06	2.2E+04	NC	8.5E-08
on	SWMU 12	VOC	Carbon Disulfide	75-15-0		16	1	5.10E-04	5.10E-04		5.10E-04	1.2E+03	NC	4.2E-07	5.1E+01	1.0E-05	3.6E+02	NC	1.4E-06
on	SWMU 12	VOC	Chlorobenzene	108-90-7	D	16	1	3.90E-04	3.90E-04		3.90E-04	5.3E+02	NC	7.4E-07	4.9E+00	7.9E-05	1.5E+02	NC	2.6E-06
on	SWMU 12	VOC	Ethyl Benzene	100-41-4	D	16	2	5.40E-04	6.10E-04		6.10E-04	7.4E+03	NC	8.2E-08	7.8E+01	7.9E-06	1.9E+03	NC	3.3E-07
on	SWMU 12	VOC	Methylene Chloride	75-09-2	B2	16	6	1.00E-03	2.90E-03		2.90E-03	2.1E+02	C	1.4E-05	4.3E+00	6.7E-04	9.1E+01	C	3.2E-05
on	SWMU 12	VOC	Toluene	108-88-3	ID	16	5	3.40E-04	1.30E-03		1.30E-03	2.2E+03	NC	5.9E-07	3.6E+02	3.6E-06	6.6E+02	NC	2.0E-06
on	SWMU 12	VOC	Xylenes (total)	1330-20-7	ID	16	2	1.00E-03	1.30E-03		1.30E-03	9.0E+02	NC	1.4E-06	9.5E+00	1.4E-04	2.7E+02	NC	4.8E-06
on	SWMU 12	SVOC	Aniline	62-53-3	B2	16	1	1.70E-02	1.70E-02		1.70E-02	3.0E+03	C	5.6E-06	4.0E+01	4.3E-04	4.3E+02	NC	4.0E-05
on	SWMU 12	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	16	15	2.60E-02	4.20E-01		4.20E-01	1.2E+03	C	3.4E-04	4.2E+09	1.0E-10	3.5E+02	C	1.2E-03
on	SWMU 12	SVOC	Diethylphthalate	84-66-2	D	16	1	4.70E-02	4.70E-02		4.70E-02	4.9E+05	NC	9.5E-08	5.2E+06	9.0E-09	4.9E+04	NC	9.6E-07
on	SWMU 12	SVOC	Pyrene	129-00-0	NC	16	1	1.20E-02	1.20E-02		1.20E-02	2.9E+04	NC	4.1E-07	2.9E+06	4.1E-09	2.3E+03	NC	5.2E-06
on	SWMU 12	INORG	Aluminum	7429-90-5	ID	11	11	1.16E+03	9.09E+03		9.09E+03	9.2E+05	NC	9.9E-03			7.6E+04	NC	1.2E-01
on	SWMU 12	INORG	Arsenic	7440-38-2	A	11	11	2.10E+00	9.70E+00	1.30E+01		1.6E+01	C				3.9E+00	C	
on	SWMU 12	INORG	Barium	7440-39-3	NC	11	11	9.10E+00	2.00E+02	1.40E+02	6.00E+01	6.7E+04	NC	9.0E-04			5.4E+03	NC	1.1E-02
on	SWMU 12	INORG	Beryllium	7440-41-7	B1	11	5	5.70E-02	2.80E-01		2.80E-01	1.9E+03	NC	1.4E-04			1.5E+02	NC	1.8E-03

Table 2-1a: Soil Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Site-Specific Background (mg/kg)	Maximum Exposure Conc (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Ratio of Max Detect to Industrial Soil Volatilization to Indoor Air Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	SWMU 12	INORG	Cadmium	7440-43-9	B1	11	8	5.30E-02	1.10E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	SWMU 12	INORG	Chromium III	16065-83-1	D	11	11	2.18E+00	1.18E+01		1.18E+01	1.5E+06	NC	7.7E-06			1.2E+05	NC	1.0E-04
on	SWMU 12	INORG	Chromium VI	18540-29-9	A	11	8	3.00E-01	1.00E+00		1.00E+00	2.5E+03	NC	3.9E-04			2.2E+02	NC	4.5E-03
on	SWMU 12	INORG	Cobalt	7440-48-4	LC	11	11	1.60E+00	6.60E+00		6.60E+00	1.3E+04	NC	5.0E-04			1.4E+03	NC	4.8E-03
on	SWMU 12	INORG	Copper	7440-50-8	D	11	11	3.70E+00	1.75E+01		1.75E+01	4.1E+04	NC	4.3E-04			3.1E+03	NC	5.6E-03
on	SWMU 12	INORG	Iron	7439-89-6	D	11	11	4.84E+03	1.99E+04	1.84E+04	1.50E+03	3.1E+05	NC	4.9E-03			2.3E+04	NC	6.4E-02
on	SWMU 12	INORG	Lead	7439-92-1	B2	11	11	2.10E+00	1.11E+01	3.70E+01		8.0E+02	NC				4.0E+02	NC	
on	SWMU 12	INORG	Manganese	7439-96-5	D	11	11	2.77E+02	8.64E+02	4.59E+02	4.05E+02	1.9E+04	NC	2.1E-02			1.8E+03	NC	2.3E-01
on	SWMU 12	INORG	Mercury	7439-97-6	D	11	2	2.90E-02	4.10E-02	1.30E-01		1.4E+01	NC		2.9E+01		3.7E+00	NC	
on	SWMU 12	INORG	Nickel	7440-02-0	A	11	11	3.90E+00	1.49E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	SWMU 12	INORG	Thallium	7440-28-0		11	9	6.60E-01	1.70E+00		1.70E+00	6.7E+01	NC	2.5E-02			5.2E+00	NC	3.3E-01
on	SWMU 12	INORG	Vanadium	7440-62-2		11	11	4.40E+00	2.09E+01		2.09E+01	1.0E+03	NC	2.0E-02			7.8E+01	NC	2.7E-01
on	SWMU 12	INORG	Zinc	7440-66-6	ID	11	11	1.16E+01	4.86E+01	9.00E+01		3.1E+05	NC				2.3E+04	NC	
on	SWMU 13	VOC	Acetonitrile	75-05-8	D	15	10	5.40E-03	7.90E-03		7.90E-03	1.8E+03	NC	4.3E-06	3.1E+01	2.5E-04	4.2E+02	NC	1.9E-05
on	SWMU 13	VOC	Benzene	71-43-2	A	15	1	3.80E-04	3.80E-04		3.80E-04	1.4E+01	C	2.7E-05	2.6E-01	1.5E-03	6.4E+00	C	5.9E-05
on	SWMU 13	VOC	Ethyl Benzene	100-41-4	D	15	1	5.50E-04	5.50E-04		5.50E-04	7.4E+03	NC	7.4E-08	7.8E+01	7.1E-06	1.9E+03	NC	2.9E-07
on	SWMU 13	VOC	4-Methyl-2-pentanone	108-10-1	ID	15	1	7.90E-02	7.90E-02		7.90E-02	4.7E+04	NC	1.7E-06	6.7E+02	1.2E-04	5.3E+03	NC	1.5E-05
on	SWMU 13	VOC	Methylene Chloride	75-09-2	B2	15	14	1.60E-03	5.00E-03		5.00E-03	2.1E+02	C	2.4E-05	4.3E+00	1.2E-03	9.1E+01	C	5.5E-05
on	SWMU 13	VOC	Styrene	100-42-5		15	4	9.20E-04	9.80E-04		9.80E-04	1.8E+04	NC	5.4E-08	4.5E+02	2.2E-06	4.4E+03	NC	2.2E-07
on	SWMU 13	VOC	Toluene	108-88-3	ID	15	6	3.10E-04	1.70E-02		1.70E-02	2.2E+03	NC	7.7E-06	3.6E+02	4.7E-05	6.6E+02	NC	2.6E-05
on	SWMU 13	VOC	Xylenes (total)	1330-20-7	ID	15	2	9.50E-04	6.40E-02		6.40E-02	9.0E+02	NC	7.1E-05	9.5E+00	6.7E-03	2.7E+02	NC	2.4E-04
on	SWMU 13	SVOC	Benzo(b)fluoranthene	205-99-2	B2	15	1	1.60E-02	1.60E-02		1.60E-02	2.1E+01	C	7.6E-04	1.4E+04	1.2E-06	6.2E+00	C	2.6E-03
on	SWMU 13	SVOC	Benzo(g,h,i)perylene	191-24-2	D	15	1	1.60E-02	1.60E-02		1.60E-02	2.9E+04	NC	5.5E-07	3.1E+10	5.2E-13	2.3E+03	NC	6.9E-06
on	SWMU 13	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	15	12	2.00E-02	1.60E+00		1.60E+00	1.2E+03	C	1.3E-03	4.2E+09	3.8E-10	3.5E+02	C	4.6E-03
on	SWMU 13	SVOC	Diethylphthalate	84-66-2	D	15	2	3.00E-02	1.40E-01		1.40E-01	4.9E+05	NC	2.8E-07	5.2E+06	2.7E-08	4.9E+04	NC	2.9E-06
on	SWMU 13	SVOC	Isophorone	78-59-1	C	15	1	4.10E-02	4.10E-02		4.10E-02	5.1E+03	C	8.0E-06			5.1E+03	C	8.0E-06
on	SWMU 13	SVOC	2-Methylnaphthalene	91-57-6	ID	15	1	2.00E-02	2.00E-02		2.00E-02	1.9E+02	NC	1.1E-04			5.6E+01	NC	3.6E-04
on	SWMU 13	INORG	Aluminum	7429-90-5	ID	10	10	1.49E+03	1.32E+04		1.32E+04	9.2E+05	NC	1.4E-02			7.6E+04	NC	1.7E-01
on	SWMU 13	INORG	Arsenic	7440-38-2	A	10	10	2.80E+00	1.23E+01	1.30E+01		1.6E+01	C				3.9E+00	C	
on	SWMU 13	INORG	Barium	7440-39-3	NC	10	10	9.50E+00	6.40E+01	1.40E+02		6.7E+04	NC				5.4E+03	NC	
on	SWMU 13	INORG	Beryllium	7440-41-7	B1	10	7	5.10E-02	4.30E-01		4.30E-01	1.9E+03	NC	2.2E-04			1.5E+02	NC	2.8E-03
on	SWMU 13	INORG	Cadmium	7440-43-9	B1	10	2	1.00E-01	1.20E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	SWMU 13	INORG	Chromium III	16065-83-1	D	10	10	2.99E+00	1.64E+01		1.64E+01	1.5E+06	NC	1.1E-05			1.2E+05	NC	1.4E-04
on	SWMU 13	INORG	Chromium VI	18540-29-9	A	10	7	2.40E-01	1.00E+00		1.00E+00	2.5E+03	NC	3.9E-04			2.2E+02	NC	4.5E-03
on	SWMU 13	INORG	Cobalt	7440-48-4	LC	10	10	2.10E+00	8.00E+00		8.00E+00	1.3E+04	NC	6.0E-04			1.4E+03	NC	5.8E-03
on	SWMU 13	INORG	Copper	7440-50-8	D	10	10	4.30E+00	1.96E+01		1.96E+01	4.1E+04	NC	4.8E-04			3.1E+03	NC	6.3E-03
on	SWMU 13	INORG	Iron	7439-89-6	D	10	10	5.01E+03	2.49E+04	1.84E+04	6.50E+03	3.1E+05	NC	2.1E-02			2.3E+04	NC	2.8E-01
on	SWMU 13	INORG	Lead	7439-92-1	B2	10	10	2.50E+00	1.92E+01	3.70E+01		8.0E+02	NC				4.0E+02	NC	
on	SWMU 13	INORG	Manganese	7439-96-5	D	10	10	9.80E+01	5.28E+02	4.59E+02	6.90E+01	1.9E+04	NC	3.5E-03			1.8E+03	NC	3.9E-02
on	SWMU 13	INORG	Mercury	7439-97-6	D	10	3	2.30E-02	3.90E-02	1.30E-01		1.4E+01	NC		2.9E+01		3.7E+00	NC	
on	SWMU 13	INORG	Nickel	7440-02-0	A	10	10	4.70E+00	1.75E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	SWMU 13	INORG	Thallium	7440-28-0		10	5	6.20E-01	1.10E+00		1.10E+00	6.7E+01	NC	1.6E-02			5.2E+00	NC	2.1E-01
on	SWMU 13	INORG	Vanadium	7440-62-2		10	10	4.60E+00	2.74E+01		2.74E+01	1.0E+03	NC	2.7E-02			7.8E+01	NC	3.5E-01
on	SWMU 13	INORG	Zinc	7440-66-6	ID	10	10	1.35E+01	5.70E+01	9.00E+01		3.1E+05	NC				2.3E+04	NC	
on	SWMU 15	VOC	Acetone	67-64-1	ID	16	7	5.20E-03	1.30E-02		1.30E-02	5.4E+04	NC	2.4E-07	1.7E+04	7.5E-07	1.4E+04	NC	9.2E-07
on	SWMU 15	VOC	Methylene Chloride	75-09-2	B2	16	7	9.50E-04	3.60E-03		3.60E-03	2.1E+02	C	1.8E-05	4.3E+00	8.3E-04	9.1E+01	C	4.0E-05

Table 2-1a: Soil Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Site-Specific Background (mg/kg)	Maximum Exposure Conc (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Ratio of Max Detect to Industrial Soil Volatilization to Indoor Air Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	SWMU 15	VOC	Tetrachloroethene	127-18-4	C-B2	16	1	5.50E-03	5.50E-03		5.50E-03	1.3E+01	C	4.2E-04	6.6E-01	8.3E-03	4.8E+00	C	1.1E-03
on	SWMU 15	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	16	12	2.90E-02	2.40E+02		2.40E+02	1.2E+03	C	1.9E-01	4.2E+09	5.7E-08	3.5E+02	C	6.9E-01
on	SWMU 15	INORG	Aluminum	7429-90-5	ID	11	11	1.50E+03	1.54E+04		1.54E+04	9.2E+05	NC	1.7E-02			7.6E+04	NC	2.0E-01
on	SWMU 15	INORG	Arsenic	7440-38-2	A	11	11	2.50E+00	1.09E+01	1.30E+01		1.6E+01	C				3.9E+00	C	
on	SWMU 15	INORG	Barium	7440-39-3	NC	11	11	1.33E+01	6.53E+01	1.40E+02		6.7E+04	NC				5.4E+03	NC	
on	SWMU 15	INORG	Beryllium	7440-41-7	B1	11	7	5.90E-02	5.30E-01		5.30E-01	1.9E+03	NC	2.7E-04			1.5E+02	NC	3.4E-03
on	SWMU 15	INORG	Cadmium	7440-43-9	B1	11	9	6.70E-02	2.00E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	SWMU 15	INORG	Chromium III	16065-83-1	D	11	11	2.82E+00	1.71E+01		1.71E+01	1.5E+06	NC	1.1E-05			1.2E+05	NC	1.5E-04
on	SWMU 15	INORG	Chromium VI	18540-29-9	A	11	5	3.70E-01	7.70E-01		7.70E-01	2.5E+03	NC	3.0E-04			2.2E+02	NC	3.5E-03
on	SWMU 15	INORG	Cobalt	7440-48-4	LC	11	11	2.40E+00	8.50E+00		8.50E+00	1.3E+04	NC	6.4E-04			1.4E+03	NC	6.2E-03
on	SWMU 15	INORG	Copper	7440-50-8	D	11	11	4.60E+00	1.85E+01		1.85E+01	4.1E+04	NC	4.5E-04			3.1E+03	NC	5.9E-03
on	SWMU 15	INORG	Iron	7439-89-6	D	11	11	5.06E+03	2.56E+04	1.84E+04	7.20E+03	3.1E+05	NC	2.3E-02			2.3E+04	NC	3.1E-01
on	SWMU 15	INORG	Lead	7439-92-1	B2	11	11	2.50E+00	1.72E+01	3.70E+01		8.0E+02	NC				4.0E+02	NC	
on	SWMU 15	INORG	Manganese	7439-96-5	D	11	11	2.65E+02	9.88E+02	4.59E+02	5.29E+02	1.9E+04	NC	2.7E-02			1.8E+03	NC	3.0E-01
on	SWMU 15	INORG	Mercury	7439-97-6	D	11	7	2.10E-02	3.70E-02	1.30E-01		1.4E+01	NC		2.9E+01		3.7E+00	NC	
on	SWMU 15	INORG	Nickel	7440-02-0	A	11	11	4.90E+00	1.79E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	SWMU 15	INORG	Thallium	7440-28-0		11	8	8.60E-01	1.50E+00		1.50E+00	6.7E+01	NC	2.2E-02			5.2E+00	NC	2.9E-01
on	SWMU 15	INORG	Vanadium	7440-62-2		11	11	5.60E+00	2.99E+01		2.99E+01	1.0E+03	NC	2.9E-02			7.8E+01	NC	3.8E-01
on	SWMU 15	INORG	Zinc	7440-66-6	ID	11	11	1.69E+01	6.40E+01	9.00E+01		3.1E+05	NC				2.3E+04	NC	
on	SWMU 23	VOC	1,2-Dichlorobenzene	95-50-1	D	12	1	8.20E-02	8.20E-02		8.20E-02	4.1E+03	NC	2.0E-05	1.4E+01	6.0E-03	1.1E+03	NC	7.4E-05
on	SWMU 23	VOC	Toluene	108-88-3	ID	12	2	1.10E-03	1.90E-03		1.90E-03	2.2E+03	NC	8.6E-07	3.6E+02	5.2E-06	6.6E+02	NC	2.9E-06
on	SWMU 23	SVOC	Benzo(a)anthracene	56-55-3	B2	12	1	1.30E-02	1.30E-02		1.30E-02	2.1E+01	C	6.2E-04	1.2E+05	1.1E-07	6.2E+00	C	2.1E-03
on	SWMU 23	SVOC	Benzo(a)pyrene	50-32-8	B2	12	1	1.70E-02	1.70E-02		1.70E-02	2.1E+00	C	8.1E-03	1.3E+05	1.3E-07	6.2E-01	C	2.7E-02
on	SWMU 23	SVOC	Benzo(b)fluoranthene	205-99-2	B2	12	2	1.30E-02	2.50E-02		2.50E-02	2.1E+01	C	1.2E-03	1.4E+04	1.8E-06	6.2E+00	C	4.0E-03
on	SWMU 23	SVOC	Benzo(g,h,i)perylene	191-24-2	D	12	1	1.50E-02	1.50E-02		1.50E-02	2.9E+04	NC	5.2E-07	3.1E+10	4.8E-13	2.3E+03	NC	6.5E-06
on	SWMU 23	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	12	1	2.30E-02	2.30E-02		2.30E-02	1.2E+03	C	1.9E-05	4.2E+09	5.5E-12	3.5E+02	C	6.6E-05
on	SWMU 23	SVOC	Chrysene	218-01-9	B2	12	1	1.80E-02	1.80E-02		1.80E-02	2.1E+03	C	8.5E-06	4.8E+05	3.7E-08	6.2E+02	C	2.9E-05
on	SWMU 23	SVOC	Fluoranthene	206-44-0	D	12	3	1.50E-02	3.70E-02		3.70E-02	2.2E+04	NC	1.7E-06	2.6E+06	1.4E-08	2.3E+03	NC	1.6E-05
on	SWMU 23	SVOC	Phenanthrene	85-01-8	D	12	1	1.80E-02	1.80E-02		1.80E-02	2.9E+04	NC	6.2E-07	3.5E+05	5.1E-08	2.3E+03	NC	7.8E-06
on	SWMU 23	SVOC	Pyrene	129-00-0	NC	12	2	1.40E-02	2.90E-02		2.90E-02	2.9E+04	NC	1.0E-06	2.9E+06	1.0E-08	2.3E+03	NC	1.3E-05
on	SWMU 23	INORG	Aluminum	7429-90-5	ID	12	12	2.59E+03	2.09E+04		2.09E+04	9.2E+05	NC	2.3E-02			7.6E+04	NC	2.7E-01
on	SWMU 23	INORG	Arsenic	7440-38-2	A	13	13	2.90E+00	1.42E+01	1.30E+01	1.20E+00	1.6E+01	C	7.5E-02			3.9E+00	C	3.1E-01
on	SWMU 23	INORG	Barium	7440-39-3	NC	12	12	1.26E+01	9.82E+01	1.40E+02		6.7E+04	NC				5.4E+03	NC	
on	SWMU 23	INORG	Beryllium	7440-41-7	B1	12	11	4.60E-02	6.80E-01		6.80E-01	1.9E+03	NC	3.5E-04			1.5E+02	NC	4.4E-03
on	SWMU 23	INORG	Cadmium	7440-43-9	B1	12	12	1.60E-01	2.40E-01	1.25E+00		4.5E+02	NC				3.7E+01	NC	
on	SWMU 23	INORG	Chromium III	16065-83-1	D	12	12	3.83E+00	2.16E+01		2.16E+01	1.5E+06	NC	1.4E-05			1.2E+05	NC	1.8E-04
on	SWMU 23	INORG	Chromium VI	18540-29-9	A	12	12	5.70E-01	3.00E+00		3.00E+00	2.5E+03	NC	1.2E-03			2.2E+02	NC	1.3E-02
on	SWMU 23	INORG	Cobalt	7440-48-4	LC	12	12	2.50E+00	9.90E+00		9.90E+00	1.3E+04	NC	7.4E-04			1.4E+03	NC	7.2E-03
on	SWMU 23	INORG	Copper	7440-50-8	D	12	12	7.50E+00	2.23E+01		2.23E+01	4.1E+04	NC	5.5E-04			3.1E+03	NC	7.1E-03
on	SWMU 23	INORG	Iron	7439-89-6	D	12	12	6.93E+03	3.01E+04	1.84E+04	1.17E+04	3.1E+05	NC	3.8E-02			2.3E+04	NC	5.0E-01
on	SWMU 23	INORG	Lead	7439-92-1	B2	12	11	3.00E+00	1.66E+01	3.70E+01		8.0E+02	NC				4.0E+02	NC	
on	SWMU 23	INORG	Manganese	7439-96-5	D	12	12	2.57E+02	1.09E+03	4.59E+02	6.31E+02	1.9E+04	NC	3.2E-02			1.8E+03	NC	3.6E-01
on	SWMU 23	INORG	Mercury	7439-97-6	D	12	9	1.60E-02	7.40E-02	1.30E-01		1.4E+01	NC		2.9E+01		3.7E+00	NC	
on	SWMU 23	INORG	Nickel	7440-02-0	A	12	12	6.30E+00	2.04E+01	3.30E+01		2.0E+04	NC				1.6E+03	NC	
on	SWMU 23	INORG	Thallium	7440-28-0		12	1	5.80E-01	5.80E-01		5.80E-01	6.7E+01	NC	8.6E-03			5.2E+00	NC	1.1E-01
on	SWMU 23	INORG	Vanadium	7440-62-2		12	12	7.90E+00	4.17E+01		4.17E+01	1.0E+03	NC	4.1E-02			7.8E+01	NC	5.3E-01

Table 2-1a: Soil Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Site-Specific Background (mg/kg)	Maximum Exposure Conc (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Industrial Soil Volatilization to Indoor Air Criteria (mg/kg)	Ratio of Max Detect to Industrial Soil Volatilization to Indoor Air Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	SWMU 23	INORG	Zinc	7440-66-6	ID	12	12	1.99E+01	7.30E+01	9.00E+01		3.1E+05	NC				2.3E+04	NC	

Notes:

Only constituents detected in each area are shown.

PRGs (Preliminary Remediation Goals) - United States Environmental Protection Agency (USEPA). 2004. Region 9 Preliminary Remediation Goals. October.

The criteria for soil are the lower of the criteria at either the target cancer risk of 1E-5 or target hazard quotient of 1.

The Region 9 PRG criteria for Benzo(g,h,i)perylene are the criteria provided by the agency for Pyrene.

The criteria for Chromium (total) are the criteria provided by the agency for Chromium VI, unless otherwise noted.

The Region 9 PRG criteria for Mercury are calculated by ENVIRON to account for the vapor inhalation pathway using:
USEPA Region 9 equations, RfC from IRIS, and chemical properties from USEPA's Soil Screening Guidance.

The criteria for 2-Methylnaphthalene are the criteria provided by the agency for Naphthalene.

The concentrations for the Methylphenol isomers (2, 3, & 4) were summed before comparing to the criteria for Methylphenol (total).

The criteria for Methylphenol (total) are the Region 9 PRGs for 4-Methylphenol.

The criteria for Phenanthrene are the criteria provided by the agency for Pyrene.

The Region 9 PRG criteria for trichloroethene are derived using the toxicity values presented in the Region 9 PRGs (2000) and an ingestion rate adjusted to be consistent with the 2004 Region 9 PRG calculations.

The concentrations for the Xylene isomers (m/p and o) were summed before comparing to the criteria for Xylenes (total).

Ratios of concentration to the criteria greater than 1 are shaded in bold.

C - The criterion is based on cancer risk at the indicated cancer risk.

NC - The criterion is based on noncancer effects at the indicated hazard quotient.

Chem Group - chemical group

Carc Class - USEPA Weight-of-Evidence Cancer Classification

NA - Migration to Groundwater criteria are above soil saturation limits and are therefore not applicable.

Background Metals Concentrations Sources:
Iron and manganese - Dragun, J. and K. Chekiri. 2005. Elements in North American Soils. Amherst Scientific Publishers, Amherst, Massachusetts.
Lead, mercury, nickel, arsenic, barium, cadmium, chromium (total) and zinc - Ohio Environmental Protection Agency (OEPA). 2008. Division of Hazardous Waste Management. Closure Plan Review Guidance for RCRA Facilities.

See Appendix A for calculation of Industrial Soil Volatilization to Indoor Air Criteria.

Table 2-1b: Soil Samples Exceeding Screening Criteria Bway Corporation, Cincinnati, Ohio																					
On/Off-site	**Area**	**Location**	**Sample ID**	**Sample Type**	**Top Depth (ft)**	**Bottom Depth (ft)**	**Sample Date**	**Chem Group**	**Chemical**	**CASRN**	**Conc** (mg/kg)	**Qual**	**Site Specific Background** (mg/kg)	**Industrial PRG-Based Criteria (mg/kg)**	**Ratio of Conc to Industrial PRG-Based Criteria**	**Industrial Soil Volatilization to Indoor Air Criteria** (mg/kg)	**Ratio of Conc to Industrial Soil Volatilization to Indoor Air Criteria**	**Residential PRG-Based Criteria (mg/kg)**	**Ratio of Conc to Residential PRG-Based Criteria**	**Deepest Soil Analysis**
on	SWMU 11	B01-04	B01-04/6-8/062508	N	6	8	06/25/08	VOC	Tetrachloroethene	127-18-4	8.10E-01			1.3E+01	6.2E-02	6.6E-01	**1.2E+00**	4.8E+00	1.7E-01	No

Table 2-2a: Groundwater Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria	Industrial GW Volatilization to Indoor Air Criteria (mg/L)	Ratio of Max Detect to Industrial GW Volatilization to Indoor Air Criteria
on	SWMU 23	VOC	1,1,1-Trichloroethane	71-55-6	T	ID	20	2	3.20E-04	3.50E-04	2.0E-01	SM	1.8E-03	6.1E+03	5.8E-08
on	SWMU 23	VOC	Trichloroethene	79-01-6	T	C-B2	20	5	1.70E-02	3.40E-02	5.0E-03	SM	**6.8E+00**	2.1E+01	1.6E-03
on	SWMU 23	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	18	1	2.10E-03	2.10E-03	6.0E-03	SM	3.5E-01	3.9E+05	5.4E-09
on	SWMU 23	INORG	Aluminum	7429-90-5	T	ID	18	13	2.52E-01	5.47E+00	3.7E+01	NC	1.5E-01		
on	SWMU 23	INORG	Antimony	7440-36-0	T		18	1	4.50E-03	4.50E-03	6.0E-03	SM	7.5E-01		
on	SWMU 23	INORG	Arsenic	7440-38-2	T	A	18	7	3.80E-03	1.34E-02	1.0E-02	SM	**1.3E+00**		
on	SWMU 23	INORG	Barium	7440-39-3	T	NC	18	8	3.91E-02	7.87E-02	2.0E+00	SM	3.9E-02		
on	SWMU 23	INORG	Chromium (total)	7440-47-3	T		18	6	4.30E-03	3.29E-01	1.0E-01	SM	**3.3E+00**		
on	SWMU 23	INORG	Cobalt	7440-48-4	T	LC	18	3	3.10E-03	3.80E-03	7.3E-01	NC	5.2E-03		
on	SWMU 23	INORG	Copper	7440-50-8	T	D	18	3	8.80E-03	1.00E-02	1.3E+00	SM	7.7E-03		
on	SWMU 23	INORG	Iron	7439-89-6	T	D	18	15	9.39E-02	2.64E+01	1.1E+01	NC	**2.4E+00**		
on	SWMU 23	INORG	Lead	7439-92-1	T	B2	18	5	3.10E-03	1.62E-02	1.5E-02	SM	**1.1E+00**		
on	SWMU 23	INORG	Manganese	7439-96-5	T	D	18	14	6.70E-03	1.23E+00	8.8E-01	NC	**1.4E+00**		
on	SWMU 23	INORG	Mercury	7439-97-6	T	D	18	2	1.20E-04	1.70E-04	2.0E-03	SM	8.5E-02	6.7E-01	2.5E-04
on	SWMU 23	INORG	Nickel	7440-02-0	T	A	18	5	3.20E-03	1.87E-01	7.3E-01	NC	2.6E-01		
on	SWMU 23	INORG	Phosphorus (total)	7723-14-0	T		18	17	6.80E-02	7.80E-01					
on	SWMU 23	INORG	Thallium	7440-28-0	T		18	4	5.40E-03	1.62E-02	2.0E-03	SM	**8.1E+00**		
on	SWMU 23	INORG	Vanadium	7440-62-2	T		18	3	5.60E-03	6.20E-03	3.7E-02	NC	1.7E-01		
on	SWMU 23	INORG	Zinc	7440-66-6	T	ID	18	5	5.40E-03	1.08E-01	1.1E+01	NC	9.9E-03		
off	AOI B	VOC	Chloroform	67-66-3	T	B2	7	2	3.90E-04	3.90E-04	8.0E-02	SM	4.9E-03		
off	AOI B	VOC	Toluene	108-88-3	T	ID	7	1	2.70E-04	2.70E-04	1.0E+00	SM	2.7E-04		
off	AOI B	SVOC	Benzo(b)fluoranthene	205-99-2	T	B2	7	1	4.80E-04	4.80E-04	9.2E-04	C	5.2E-01		
off	AOI B	SVOC	Fluoranthene	206-44-0	T	D	7	2	2.40E-04	4.00E-04	1.5E+00	NC	2.7E-04		
off	AOI B	SVOC	Pyrene	129-00-0	T	NC	7	1	2.10E-04	2.10E-04	1.1E+00	NC	1.9E-04		
off	AOI B	INORG	Aluminum	7429-90-5	D	ID	7	1	1.46E-01	1.46E-01	3.7E+01	NC	4.0E-03		
off	AOI B	INORG	Aluminum	7429-90-5	T	ID	7	4	1.27E-01	3.60E+00	3.7E+01	NC	9.9E-02		
off	AOI B	INORG	Antimony	7440-36-0	T		7	1	1.90E-03	1.90E-03	6.0E-03	SM	3.2E-01		
off	AOI B	INORG	Arsenic	7440-38-2	T	A	7	3	4.20E-03	7.80E-03	1.0E-02	SM	7.8E-01		
off	AOI B	INORG	Barium	7440-39-3	D	NC	7	7	3.07E-02	7.33E-02	2.0E+00	SM	3.7E-02		
off	AOI B	INORG	Barium	7440-39-3	T	NC	7	7	4.63E-02	7.17E-02	2.0E+00	SM	3.6E-02		
off	AOI B	INORG	Chromium (total)	7440-47-3	D		7	1	3.40E-03	3.40E-03	1.0E-01	SM	3.4E-02		
off	AOI B	INORG	Chromium III	16065-83-1	T	D	7	2	4.10E-03	1.24E-02	1.0E-01	SM	1.2E-01		
off	AOI B	INORG	Chromium VI	18540-29-9	T	A	7	2	4.00E-03	9.00E-03	1.0E-01	SM	9.0E-02		
off	AOI B	INORG	Cobalt	7440-48-4	T	LC	7	2	1.90E-03	3.40E-03	7.3E-01	NC	4.7E-03		
off	AOI B	INORG	Copper	7440-50-8	T	D	7	3	6.80E-03	1.46E-02	1.3E+00	SM	1.1E-02		
off	AOI B	INORG	Iron	7439-89-6	D	D	7	2	1.71E-01	5.57E-01	1.1E+01	NC	5.1E-02		
off	AOI B	INORG	Iron	7439-89-6	T	D	7	5	8.49E-02	8.19E+00	1.1E+01	NC	7.5E-01		
off	AOI B	INORG	Lead	7439-92-1	T	B2	7	3	2.30E-03	4.70E-03	1.5E-02	SM	3.1E-01		
off	AOI B	INORG	Manganese	7439-96-5	D	D	7	6	6.90E-04	3.17E-01	8.8E-01	NC	3.6E-01		
off	AOI B	INORG	Manganese	7439-96-5	T	D	7	5	9.40E-02	3.49E-01	8.8E-01	NC	4.0E-01		
off	AOI B	INORG	Nickel	7440-02-0	T	A	7	3	5.40E-03	1.33E-02	7.3E-01	NC	1.8E-02		
off	AOI B	INORG	Selenium	7782-49-2	D	D	7	1	4.30E-03	4.30E-03	5.0E-02	SM	8.6E-02		
off	AOI B	INORG	Selenium	7782-49-2	T	D	7	1	4.60E-03	4.60E-03	5.0E-02	SM	9.2E-02		

Table 2-2a: Groundwater Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria	Industrial GW Volatilization to Indoor Air Criteria (mg/L)	Ratio of Max Detect to Industrial GW Volatilization to Indoor Air Criteria
off	AOI B	INORG	Thallium	7440-28-0	D		7	1	5.70E-03	5.70E-03	2.0E-03	SM	**2.9E+00**		
off	AOI B	INORG	Vanadium	7440-62-2	T		7	3	3.40E-03	1.15E-02	3.7E-02	NC	3.2E-01		
off	AOI B	INORG	Zinc	7440-66-6	T	ID	7	4	2.90E-02	7.20E-02	1.1E+01	NC	6.6E-03		

Notes:
Only constituents detected in each area are shown.
The drinking water criteria are based on the following hierarchy: State MCL, Federal MCL, USEPA Region 9 Tap Water Ingestion value at the lower of the criteria calculated at either the target cancer risk of 1E-5 or target hazard quotient of 1*.
*United States Environmental Protection Agency (USEPA). 2004. Region 9 Preliminary Remediation Goals. October.
The industrial volatilization to indoor air criteria are the lower of the criteria at either the target cancer risk of 1E-5 or target hazard quotient of 1.
The criteria for Chromium (total) are the criteria provided by the agency for Chromium VI.
Ratios of concentration to the criteria greater than 1 are shaded in bold.
The results for AOI B consist of sediment pore water samples collected from the off-site quarry pond. Therefore, comparison to the industrial groundwater volatilization to indoor air criteria is not considered a relevant pathway.
SM - The criterion is the State MCL.
C - The criterion is based on cancer risk at a target cancer risk of 1E-5.
NC - The criterion is based on noncancer effects at a hazard quotient of 1.
Chem Group - chemical group
Meas Basis - measured basis; T = total, D = dissolved
Carc Class - USEPA Weight-of-Evidence Cancer Classification
See Appendix A for calculation of Industrial Groundwater Volatilization to Indoor Air Criteria.

Table 2-2b: Groundwater Samples Exceeding Screening Criteria
Bway Corporation, Cincinnati, Ohio

On/Off Site	Area	Location	Sample ID	Sample Type	Sample Date	Chem Group	Chemical	CASRN	Meas Basis	Conc (mg/L)	Qual	Drinking Water Criteria (mg/L)	Ratio of Conc to Drinking Water Criteria	Industrial GW Volatilization to Indoor Air Criteria (mg/L)	Ratio of Conc to Industrial GW Volatilization to Indoor Air Criteria
off	AOI B	PW-06	PW06-092408	N	09/24/08	INORG	Thallium	7440-28-0	D	5.70E-03	B	2.0E-03	**2.9E+00**		
on	SWMU 23	OW-1	OW-1/061608	N	06/16/08	INORG	Arsenic	7440-38-2	T	1.09E-02		1.0E-02	**1.1E+00**		
on	SWMU 23	OW-1	DUP01/061608	FD	06/16/08	INORG	Thallium	7440-28-0	T	6.40E-03	B J	2.0E-03	**3.2E+00**		
on	SWMU 23	OW-1	OW-1/061608	N	06/16/08	INORG	Thallium	7440-28-0	T	7.70E-03	B J	2.0E-03	**3.9E+00**		
on	SWMU 23	OW-2	OW-2	N	08/15/07	INORG	Chromium (total)	7440-47-3	T	3.29E-01		1.0E-01	**3.3E+00**		
on	SWMU 23	OW-2	OW-2/061608	N	06/16/08	INORG	Thallium	7440-28-0	T	5.40E-03	B J	2.0E-03	**2.7E+00**		
on	SWMU 23	OW-3	OW-3	N	08/15/07	VOC	Trichloroethene	79-01-6	T	3.30E-02		5.0E-03	**6.6E+00**	2.1E+01	1.5E-03
on	SWMU 23	OW-3	OW-3	N	08/15/07	INORG	Arsenic	7440-38-2	T	1.34E-02		1.0E-02	**1.3E+00**		
on	SWMU 23	OW-3	OW-3	N	08/15/07	INORG	Iron	7439-89-6	T	2.64E+01		1.1E+01	**2.4E+00**		
on	SWMU 23	OW-3	OW-3	N	08/15/07	INORG	Lead	7439-92-1	T	1.62E-02		1.5E-02	**1.1E+00**		
on	SWMU 23	OW-3	OW-3	N	08/15/07	INORG	Manganese	7439-96-5	T	1.23E+00		8.8E-01	**1.4E+00**		
on	SWMU 23	OW-3	OW-3/122107	N	12/21/07	VOC	Trichloroethene	79-01-6	T	3.40E-02		5.0E-03	**6.8E+00**	2.1E+01	1.6E-03
on	SWMU 23	OW-3	OW-3/03172008	N	03/17/08	VOC	Trichloroethene	79-01-6	T	2.00E-02		5.0E-03	**4.0E+00**	2.1E+01	9.3E-04
on	SWMU 23	OW-3	OW-3/061608	N	06/16/08	VOC	Trichloroethene	79-01-6	T	1.70E-02		5.0E-03	**3.4E+00**	2.1E+01	7.9E-04
on	SWMU 23	OW-3	OW-3/061608	N	06/16/08	INORG	Thallium	7440-28-0	T	1.62E-02	J	2.0E-03	**8.1E+00**		
on	SWMU 23	OW-3	OW-3/091108	N	09/11/08	VOC	Trichloroethene	79-01-6	T	2.40E-02		5.0E-03	**4.8E+00**	2.1E+01	1.1E-03

Table 2-3a: Surface Water Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria
on	AOI C	VOC	Acetone	67-64-1	T	ID	6	3	1.20E-03	3.60E-03	3.3E+01	NC	1.1E-04
on	AOI C	VOC	2-Butanone	78-93-3	T	ID	6	3	7.90E-04	1.30E-03	2.2E+01	NC	5.9E-05
on	AOI C	VOC	Carbon Disulfide	75-15-0	T		6	2	3.10E-04	1.50E-03	3.7E+00	NC	4.1E-04
on	AOI C	VOC	Toluene	108-88-3	T	ID	6	3	2.50E-04	1.90E-03	1.0E+00	SM	1.9E-03
on	AOI C	VOC	Trichloroethene	79-01-6	T	C-B2	6	2	2.80E-04	3.30E-04	5.0E-03	SM	6.6E-02
on	AOI C	VOC	Vinyl Chloride	75-01-4	T	A	6	1	6.80E-04	6.80E-04	2.0E-03	SM	3.4E-01
on	AOI C	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	6	3	1.20E-03	4.10E-03	6.0E-03	SM	6.8E-01
on	AOI C	SVOC	Methylphenol (total)	1319-77-3	T		6	1	1.55E-02	1.55E-02	1.8E-01	NC	8.5E-02
on	AOI C	INORG	Aluminum	7429-90-5	T	ID	6	1	8.10E-01	8.10E-01	3.7E+01	NC	2.2E-02
on	AOI C	INORG	Arsenic	7440-38-2	T	A	6	1	3.60E-03	3.60E-03	1.0E-02	SM	3.6E-01
on	AOI C	INORG	Barium	7440-39-3	D	NC	6	6	4.20E-02	8.37E-02	2.0E+00	SM	4.2E-02
on	AOI C	INORG	Barium	7440-39-3	T	NC	6	6	4.57E-02	8.45E-02	2.0E+00	SM	4.2E-02
on	AOI C	INORG	Chromium III	16065-83-1	T	D	6	1	1.00E-03	1.00E-03	1.0E-01	SM	1.0E-02
on	AOI C	INORG	Chromium VI	18540-29-9	T	A	6	1	4.00E-03	4.00E-03	1.0E-01	SM	4.0E-02
on	AOI C	INORG	Cobalt	7440-48-4	D	LC	6	2	1.80E-03	2.10E-03	7.3E-01	NC	2.9E-03
on	AOI C	INORG	Iron	7439-89-6	D	D	6	6	9.42E-02	1.49E+00	1.1E+01	NC	1.4E-01
on	AOI C	INORG	Iron	7439-89-6	T	D	6	6	2.08E-01	2.40E+00	1.1E+01	NC	2.2E-01
on	AOI C	INORG	Lead	7439-92-1	T	B2	6	1	2.00E-03	2.00E-03	1.5E-02	SM	1.3E-01
on	AOI C	INORG	Manganese	7439-96-5	D	D	6	6	3.97E-02	2.93E-01	8.8E-01	NC	3.3E-01
on	AOI C	INORG	Manganese	7439-96-5	T	D	6	6	3.57E-02	2.95E-01	8.8E-01	NC	3.4E-01
on	AOI C	INORG	Thallium	7440-28-0	D		6	1	5.80E-03	5.80E-03	2.0E-03	SM	**2.9E+00**
on	AOI C	INORG	Thallium	7440-28-0	T		6	1	5.50E-03	5.50E-03	2.0E-03	SM	**2.8E+00**
on	AOI C	INORG	Vanadium	7440-62-2	T		6	1	1.10E-03	1.10E-03	3.7E-02	NC	3.0E-02
on	AOI C	INORG	Zinc	7440-66-6	D	ID	6	1	1.00E-02	1.00E-02	1.1E+01	NC	9.1E-04
on	AOI C	INORG	Zinc	7440-66-6	T	ID	6	1	9.50E-03	9.50E-03	1.1E+01	NC	8.7E-04
on	SWMU 22	SVOC	Pyridine	110-86-1	T		3	1	6.10E-04	6.10E-04	3.7E-02	NC	1.7E-02
on	SWMU 22	INORG	Aluminum	7429-90-5	T	ID	3	2	2.25E-01	4.53E-01	3.7E+01	NC	1.2E-02
on	SWMU 22	INORG	Barium	7440-39-3	D	NC	3	1	8.00E-03	8.00E-03	2.0E+00	SM	4.0E-03
on	SWMU 22	INORG	Barium	7440-39-3	T	NC	3	3	1.05E-02	1.07E-02	2.0E+00	SM	5.4E-03
on	SWMU 22	INORG	Chromium III	16065-83-1	T	D	3	1	1.00E-03	1.00E-03	1.0E-01	SM	1.0E-02
on	SWMU 22	INORG	Chromium VI	18540-29-9	T	A	3	1	9.00E-03	9.00E-03	1.0E-01	SM	9.0E-02
on	SWMU 22	INORG	Iron	7439-89-6	T	D	3	3	1.77E-01	2.10E-01	1.1E+01	NC	1.9E-02
on	SWMU 22	INORG	Manganese	7439-96-5	D	D	3	3	3.00E-02	3.31E-02	8.8E-01	NC	3.8E-02
on	SWMU 22	INORG	Manganese	7439-96-5	T	D	3	2	4.89E-02	4.94E-02	8.8E-01	NC	5.6E-02
on	SWMU 22	INORG	Mercury	7439-97-6	D	D	3	3	4.70E-04	6.00E-04	2.0E-03	SM	3.0E-01
on	SWMU 22	INORG	Mercury	7439-97-6	T	D	3	3	5.40E-04	1.60E-03	2.0E-03	SM	8.0E-01
on	SWMU 22	INORG	Nickel	7440-02-0	T	A	3	1	3.50E-03	3.50E-03	7.3E-01	NC	4.8E-03
on	SWMU 22	INORG	Thallium	7440-28-0	T		3	1	5.50E-03	5.50E-03	2.0E-03	SM	**2.8E+00**
off	AOI B	VOC	Carbon Disulfide	75-15-0	T		6	1	3.10E-04	3.10E-04	3.7E+00	NC	8.5E-05
off	AOI B	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	6	1	1.70E-03	1.70E-03	6.0E-03	SM	2.8E-01
off	AOI B	INORG	Antimony	7440-36-0	D		6	1	2.50E-03	2.50E-03	6.0E-03	SM	4.2E-01
off	AOI B	INORG	Antimony	7440-36-0	T		6	1	1.02E-02	1.02E-02	6.0E-03	SM	**1.7E+00**
off	AOI B	INORG	Barium	7440-39-3	D	NC	6	6	5.76E-02	9.43E-02	2.0E+00	SM	4.7E-02

Table 2-3a: Surface Water Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria
off	AOI B	INORG	Barium	7440-39-3	T	NC	6	6	6.00E-02	8.11E-02	2.0E+00	SM	4.1E-02
off	AOI B	INORG	Chromium III	16065-83-1	T	D	6	1	1.00E-03	1.00E-03	1.0E-01	SM	1.0E-02
off	AOI B	INORG	Chromium VI	18540-29-9	T	A	6	1	4.00E-03	4.00E-03	1.0E-01	SM	4.0E-02
off	AOI B	INORG	Iron	7439-89-6	T	D	6	4	8.85E-02	3.05E-01	1.1E+01	NC	2.8E-02
off	AOI B	INORG	Manganese	7439-96-5	D	D	6	3	1.50E-03	2.50E-02	8.8E-01	NC	2.9E-02
off	AOI B	INORG	Manganese	7439-96-5	T	D	6	6	1.31E-02	1.03E-01	8.8E-01	NC	1.2E-01
off	AOI B	INORG	Mercury	7439-97-6	D	D	6	3	1.80E-04	3.50E-04	2.0E-03	SM	1.8E-01
off	AOI B	INORG	Mercury	7439-97-6	T	D	6	3	5.20E-04	2.20E-03	2.0E-03	SM	**1.1E+00**
off	AOI B	INORG	Thallium	7440-28-0	D		6	2	4.70E-03	5.30E-03	2.0E-03	SM	**2.7E+00**
off	AOI B	INORG	Thallium	7440-28-0	T		6	1	5.30E-03	5.30E-03	2.0E-03	SM	**2.7E+00**
off	AOI B	INORG	Vanadium	7440-62-2	T		6	2	9.90E-04	1.40E-03	3.7E-02	NC	3.8E-02
off	AOI B	INORG	Zinc	7440-66-6	D	ID	6	2	5.80E-03	6.20E-03	1.1E+01	NC	5.7E-04
off	AOI B	INORG	Zinc	7440-66-6	T	ID	6	2	6.80E-03	7.32E-02	1.1E+01	NC	6.7E-03

Notes:
Only constituents detected in each area are shown.
The drinking water criteria are based on the following hierarchy: State MCL, Federal MCL, Region 9 Tap Water Ingestion value at the lower of the criteria calculated at either the target cancer risk of 1E-5 or target hazard quotient of 1*.
*United States Environmental Protection Agency (USEPA). 2004. Region 9 Preliminary Remediation Goals. October.
Ratios of concentration to the criteria greater than 1 are shaded in bold.
SM - The criterion is the State MCL.
NC - The criterion is based on noncancer effects at a hazard quotient of 1.
Chem Group - chemical group
Meas Basis - measured basis; T = total, D = dissolved
Carc Class - USEPA Weight-of-Evidence Cancer Classification

Table 2-3b: Surface Water Samples Exceeding Screening Criteria
Bway Corporation, Cincinnati, Ohio

On/Off Site	Area	Location	Sample ID	Sample Type	Sample Date	Chem Group	Chemical	CASRN	Meas Basis	Conc (mg/L)	Qual	Drinking Water Criteria (mg/L)	Ratio of Conc to Drinking Water Criteria
off	AOI B	SW-01	SW01-092208	N	09/22/08	INORG	Antimony	7440-36-0	T	1.02E-02	B	6.0E-03	**1.7E+00**
off	AOI B	SW-01	SW01-092208	N	09/22/08	INORG	Thallium	7440-28-0	T	5.30E-03	B	2.0E-03	**2.7E+00**
off	AOI B	SW-02	SW02-092208	N	09/22/08	INORG	Thallium	7440-28-0	D	5.30E-03	B	2.0E-03	**2.7E+00**
off	AOI B	SW-03	SW03-092308	N	09/23/08	INORG	Mercury	7439-97-6	T	2.20E-03		2.0E-03	**1.1E+00**
off	AOI B	SW-04	SW04-092308	N	09/23/08	INORG	Thallium	7440-28-0	D	4.70E-03	B	2.0E-03	**2.4E+00**
on	AOI C	SW-11	SW11-092608	N	09/26/08	INORG	Thallium	7440-28-0	T	5.50E-03	B	2.0E-03	**2.8E+00**
on	AOI C	SW-12	SW12-092608	N	09/26/08	INORG	Thallium	7440-28-0	D	5.80E-03	B	2.0E-03	**2.9E+00**
on	SWMU 22	SW-07	SW07-092508	N	09/25/08	INORG	Thallium	7440-28-0	T	5.50E-03	B	2.0E-03	**2.8E+00**

Table 2-4a: Sediment Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	AOI C	VOC	Acetone	67-64-1	ID	7	4	2.10E-02	1.50E-01	5.4E+04	NC	2.8E-06	1.4E+04	NC	1.1E-05
on	AOI C	VOC	2-Butanone	78-93-3	ID	7	6	3.60E-03	3.50E-02	1.1E+05	NC	3.1E-07	2.2E+04	NC	1.6E-06
on	AOI C	VOC	Tetrachloroethene	127-18-4	C-B2	7	1	4.80E-01	4.80E-01	1.3E+01	C	3.7E-02	4.8E+00	C	9.9E-02
on	AOI C	VOC	Trichloroethene	79-01-6	C-B2	7	1	8.80E-02	8.80E-02	6.1E+01	C	1.4E-03	2.3E+01	NC	3.8E-03
on	AOI C	SVOC	Benzo(a)anthracene	56-55-3	B2	7	3	7.20E-02	1.00E-01	2.1E+01	C	4.7E-03	6.2E+00	C	1.6E-02
on	AOI C	SVOC	Benzo(a)pyrene	50-32-8	B2	7	4	2.10E-02	1.20E-01	2.1E+00	C	5.7E-02	6.2E-01	C	1.9E-01
on	AOI C	SVOC	Benzo(b)fluoranthene	205-99-2	B2	7	4	3.30E-02	1.80E-01	2.1E+01	C	8.5E-03	6.2E+00	C	2.9E-02
on	AOI C	SVOC	Benzo(g,h,i)perylene	191-24-2	D	7	1	9.20E-02	9.20E-02	2.9E+04	NC	3.2E-06	2.3E+03	NC	4.0E-05
on	AOI C	SVOC	Benzo(k)fluoranthene	207-08-9	B2	7	3	6.40E-02	7.60E-02	2.1E+02	C	3.6E-04	6.2E+01	C	1.2E-03
on	AOI C	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	7	4	5.00E-02	9.70E-02	1.2E+03	C	7.9E-05	3.5E+02	C	2.8E-04
on	AOI C	SVOC	Chrysene	218-01-9	B2	7	4	2.50E-02	1.50E-01	2.1E+03	C	7.1E-05	6.2E+02	C	2.4E-04
on	AOI C	SVOC	Fluoranthene	206-44-0	D	7	5	3.40E-02	2.70E-01	2.2E+04	NC	1.2E-05	2.3E+03	NC	1.2E-04
on	AOI C	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	7	1	7.20E-02	7.20E-02	2.1E+01	C	3.4E-03	6.2E+00	C	1.2E-02
on	AOI C	SVOC	Phenanthrene	85-01-8	D	7	3	7.10E-02	1.10E-01	2.9E+04	NC	3.8E-06	2.3E+03	NC	4.7E-05
on	AOI C	SVOC	Pyrene	129-00-0	NC	7	4	3.40E-02	2.40E-01	2.9E+04	NC	8.2E-06	2.3E+03	NC	1.0E-04
on	AOI C	INORG	Aluminum	7429-90-5	ID	7	7	3.81E+03	1.38E+04	9.2E+05	NC	1.5E-02	7.6E+04	NC	1.8E-01
on	AOI C	INORG	Arsenic	7440-38-2	A	7	7	2.40E+00	7.60E+00	1.6E+01	C	4.8E-01	3.9E+00	C	**2.0E+00**
on	AOI C	INORG	Barium	7440-39-3	NC	7	7	2.91E+01	1.18E+02	6.7E+04	NC	1.8E-03	5.4E+03	NC	2.2E-02
on	AOI C	INORG	Beryllium	7440-41-7	B1	7	7	1.10E-01	7.00E-01	1.9E+03	NC	3.6E-04	1.5E+02	NC	4.5E-03
on	AOI C	INORG	Cadmium	7440-43-9	B1	7	7	1.80E-01	1.20E+00	4.5E+02	NC	2.7E-03	3.7E+01	NC	3.2E-02
on	AOI C	INORG	Chromium III	16065-83-1	D	7	7	2.00E-01	1.04E+01	1.5E+06	NC	6.8E-06	1.2E+05	NC	8.9E-05
on	AOI C	INORG	Chromium VI	18540-29-9	A	7	7	4.80E+00	2.05E+01	2.5E+03	NC	8.1E-03	2.2E+02	NC	9.2E-02
on	AOI C	INORG	Cobalt	7440-48-4	LC	7	7	3.20E+00	8.10E+00	1.3E+04	NC	6.1E-04	1.4E+03	NC	5.9E-03
on	AOI C	INORG	Copper	7440-50-8	D	7	7	1.43E+01	3.67E+01	4.1E+04	NC	9.0E-04	3.1E+03	NC	1.2E-02
on	AOI C	INORG	Iron	7439-89-6	D	7	7	6.58E+03	2.51E+04	3.1E+05	NC	8.2E-02	2.3E+04	NC	**1.1E+00**
on	AOI C	INORG	Lead	7439-92-1	B2	7	7	1.02E+01	7.22E+01	8.0E+02	NC	9.0E-02	4.0E+02	NC	1.8E-01
on	AOI C	INORG	Manganese	7439-96-5	D	7	7	7.29E+01	2.43E+02	1.9E+04	NC	1.2E-02	1.8E+03	NC	1.4E-01
on	AOI C	INORG	Mercury	7439-97-6	D	7	3	4.50E-02	1.40E-01	1.4E+01	NC	1.0E-02	3.7E+00	NC	3.8E-02
on	AOI C	INORG	Nickel	7440-02-0	A	7	7	9.10E+00	3.20E+01	2.0E+04	NC	1.6E-03	1.6E+03	NC	2.0E-02
on	AOI C	INORG	Selenium	7782-49-2	D	7	4	1.90E+00	5.40E+00	5.1E+03	NC	1.1E-03	3.9E+02	NC	1.4E-02
on	AOI C	INORG	Vanadium	7440-62-2		7	7	1.14E+01	2.78E+01	1.0E+03	NC	2.7E-02	7.8E+01	NC	3.6E-01
on	AOI C	INORG	Zinc	7440-66-6	ID	7	7	3.34E+01	1.63E+02	3.1E+05	NC	5.3E-04	2.3E+04	NC	6.9E-03
on	SWMU 22	VOC	Acetone	67-64-1	ID	3	3	2.40E-01	4.00E+00	5.4E+04	NC	7.4E-05	1.4E+04	NC	2.8E-04
on	SWMU 22	VOC	Acetonitrile	75-05-8	D	3	1	1.60E-01	1.60E-01	1.8E+03	NC	8.8E-05	4.2E+02	NC	3.8E-04
on	SWMU 22	VOC	Benzene	71-43-2	A	3	1	3.70E-03	3.70E-03	1.4E+01	C	2.6E-04	6.4E+00	C	5.8E-04
on	SWMU 22	VOC	2-Butanone	78-93-3	ID	3	3	5.30E-02	1.10E+00	1.1E+05	NC	9.7E-06	2.2E+04	NC	4.9E-05
on	SWMU 22	VOC	Carbon Disulfide	75-15-0		3	3	2.50E-02	8.40E-02	1.2E+03	NC	7.0E-05	3.6E+02	NC	2.4E-04
on	SWMU 22	VOC	Ethyl Benzene	100-41-4	D	3	3	2.00E-03	1.60E-01	7.4E+03	NC	2.2E-05	1.9E+03	NC	8.6E-05
on	SWMU 22	VOC	Methylene Chloride	75-09-2	B2	3	1	1.50E-02	1.50E-02	2.1E+02	C	7.3E-05	9.1E+01	C	1.6E-04
on	SWMU 22	VOC	Toluene	108-88-3	ID	3	3	1.20E-02	9.70E-01	2.2E+03	NC	4.4E-04	6.6E+02	NC	1.5E-03
on	SWMU 22	VOC	Xylenes (total)	1330-20-7	ID	3	3	6.80E-03	7.10E-01	9.0E+02	NC	7.9E-04	2.7E+02	NC	2.6E-03
on	SWMU 22	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	3	3	7.90E-01	4.20E+00	1.2E+03	C	3.4E-03	3.5E+02	C	1.2E-02
on	SWMU 22	INORG	Aluminum	7429-90-5	ID	3	3	3.37E+04	9.02E+04	9.2E+05	NC	9.8E-02	7.6E+04	NC	**1.2E+00**
on	SWMU 22	INORG	Antimony	7440-36-0		3	1	1.80E+00	1.80E+00	4.1E+02	NC	4.4E-03	3.1E+01	NC	5.8E-02

Table 2-4a: Sediment Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
on	SWMU 22	INORG	Arsenic	7440-38-2	A	3	3	4.90E+00	1.32E+01	1.6E+01	C	8.3E-01	3.9E+00	C	**3.4E+00**
on	SWMU 22	INORG	Barium	7440-39-3	NC	3	3	5.20E+01	1.06E+02	6.7E+04	NC	1.6E-03	5.4E+03	NC	2.0E-02
on	SWMU 22	INORG	Cadmium	7440-43-9	B1	3	3	3.00E-01	8.70E-01	4.5E+02	NC	1.9E-03	3.7E+01	NC	2.3E-02
on	SWMU 22	INORG	Chromium III	16065-83-1	D	3	3	5.17E+01	1.98E+02	1.5E+06	NC	1.3E-04	1.2E+05	NC	1.7E-03
on	SWMU 22	INORG	Cobalt	7440-48-4	LC	3	2	2.20E+00	8.70E+00	1.3E+04	NC	6.5E-04	1.4E+03	NC	6.3E-03
on	SWMU 22	INORG	Copper	7440-50-8	D	3	3	8.86E+01	4.25E+02	4.1E+04	NC	1.0E-02	3.1E+03	NC	1.4E-01
on	SWMU 22	INORG	Iron	7439-89-6	D	3	3	3.58E+03	2.35E+04	3.1E+05	NC	7.7E-02	2.3E+04	NC	1.0E+00
on	SWMU 22	INORG	Lead	7439-92-1	B2	3	3	1.83E+01	3.07E+01	8.0E+02	NC	3.8E-02	4.0E+02	NC	7.7E-02
on	SWMU 22	INORG	Manganese	7439-96-5	D	3	3	2.91E+01	2.10E+02	1.9E+04	NC	1.1E-02	1.8E+03	NC	1.2E-01
on	SWMU 22	INORG	Mercury	7439-97-6	D	3	1	1.00E-01	1.00E-01	1.4E+01	NC	7.3E-03	3.7E+00	NC	2.7E-02
on	SWMU 22	INORG	Nickel	7440-02-0	A	3	3	3.19E+01	5.08E+01	2.0E+04	NC	2.5E-03	1.6E+03	NC	3.2E-02
on	SWMU 22	INORG	Silver	7440-22-4	D	3	3	1.20E+00	1.35E+01	5.1E+03	NC	2.6E-03	3.9E+02	NC	3.5E-02
on	SWMU 22	INORG	Vanadium	7440-62-2		3	3	1.46E+01	3.44E+01	1.0E+03	NC	3.4E-02	7.8E+01	NC	4.4E-01
on	SWMU 22	INORG	Zinc	7440-66-6	ID	3	3	2.16E+02	9.43E+02	3.1E+05	NC	3.1E-03	2.3E+04	NC	4.0E-02
off	AOI B	VOC	Acetone	67-64-1	ID	6	1	1.10E-02	1.10E-02	5.4E+04	NC	2.0E-07	1.4E+04	NC	7.8E-07
off	AOI B	VOC	2-Butanone	78-93-3	ID	6	3	2.90E-03	7.50E-03	1.1E+05	NC	6.6E-08	2.2E+04	NC	3.4E-07
off	AOI B	VOC	Methylene Chloride	75-09-2	B2	6	1	1.10E-03	1.10E-03	2.1E+02	C	5.4E-06	9.1E+01	C	1.2E-05
off	AOI B	VOC	Tetrachloroethene	127-18-4	C-B2	6	1	1.00E-03	1.00E-03	1.3E+01	C	7.6E-05	4.8E+00	C	2.1E-04
off	AOI B	SVOC	Acenaphthene	83-32-9		6	4	3.20E-02	1.50E-01	2.9E+04	NC	5.1E-06	3.7E+03	NC	4.1E-05
off	AOI B	SVOC	Acenaphthylene	208-96-8	D	6	1	5.90E-02	5.90E-02	2.9E+04	NC	2.0E-06	2.3E+03	NC	2.5E-05
off	AOI B	SVOC	Anthracene	120-12-7	D	6	3	6.60E-02	4.10E-01	2.4E+05	NC	1.7E-06	2.2E+04	NC	1.9E-05
off	AOI B	SVOC	Benzo(a)anthracene	56-55-3	B2	6	5	2.40E-02	3.00E+00	2.1E+01	C	1.4E-01	6.2E+00	C	4.8E-01
off	AOI B	SVOC	Benzo(a)pyrene	50-32-8	B2	6	5	2.60E-02	3.20E+00	2.1E+00	C	**1.5E+00**	6.2E-01	C	**5.1E+00**
off	AOI B	SVOC	Benzo(b)fluoranthene	205-99-2	B2	6	5	6.10E-02	5.50E+00	2.1E+01	C	2.6E-01	6.2E+00	C	8.9E-01
off	AOI B	SVOC	Benzo(g,h,i)perylene	191-24-2	D	6	5	2.70E-02	2.70E+00	2.9E+04	NC	9.3E-05	2.3E+03	NC	1.2E-03
off	AOI B	SVOC	Benzo(k)fluoranthene	207-08-9	B2	6	5	1.90E-02	2.10E+00	2.1E+02	C	1.0E-02	6.2E+01	C	3.4E-02
off	AOI B	SVOC	Chrysene	218-01-9	B2	6	5	3.80E-02	4.50E+00	2.1E+03	C	2.1E-03	6.2E+02	C	7.2E-03
off	AOI B	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	6	2	6.00E-01	6.90E-01	2.1E+00	C	3.3E-01	6.2E-01	C	**1.1E+00**
off	AOI B	SVOC	Fluoranthene	206-44-0	D	6	5	7.30E-02	1.00E+01	2.2E+04	NC	4.5E-04	2.3E+03	NC	4.4E-03
off	AOI B	SVOC	Fluorene	86-73-7	D	6	2	8.60E-02	9.60E-02	2.6E+04	NC	3.7E-06	2.7E+03	NC	3.5E-05
off	AOI B	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	6	5	2.30E-02	2.40E+00	2.1E+01	C	1.1E-01	6.2E+00	C	3.9E-01
off	AOI B	SVOC	Phenanthrene	85-01-8	D	6	5	2.30E-02	3.50E+00	2.9E+04	NC	1.2E-04	2.3E+03	NC	1.5E-03
off	AOI B	SVOC	Pyrene	129-00-0	NC	6	5	5.20E-02	7.10E+00	2.9E+04	NC	2.4E-04	2.3E+03	NC	3.1E-03
off	AOI B	INORG	Aluminum	7429-90-5	ID	6	6	1.21E+03	5.45E+03	9.2E+05	NC	5.9E-03	7.6E+04	NC	7.2E-02
off	AOI B	INORG	Arsenic	7440-38-2	A	6	6	2.20E+00	7.90E+00	1.6E+01	C	5.0E-01	3.9E+00	C	**2.0E+00**
off	AOI B	INORG	Barium	7440-39-3	NC	6	6	7.80E+00	6.96E+01	6.7E+04	NC	1.0E-03	5.4E+03	NC	1.3E-02
off	AOI B	INORG	Beryllium	7440-41-7	B1	6	3	7.00E-02	1.90E-01	1.9E+03	NC	9.8E-05	1.5E+02	NC	1.2E-03
off	AOI B	INORG	Cadmium	7440-43-9	B1	6	5	5.00E-02	3.50E-01	4.5E+02	NC	7.8E-04	3.7E+01	NC	9.5E-03
off	AOI B	INORG	Chromium III	16065-83-1	D	6	6	3.88E+00	2.44E+01	1.5E+06	NC	1.6E-05	1.2E+05	NC	2.1E-04
off	AOI B	INORG	Cobalt	7440-48-4	LC	6	6	1.40E+00	5.40E+00	1.3E+04	NC	4.1E-04	1.4E+03	NC	3.9E-03
off	AOI B	INORG	Copper	7440-50-8	D	6	5	4.60E+00	1.67E+01	4.1E+04	NC	4.1E-04	3.1E+03	NC	5.3E-03
off	AOI B	INORG	Iron	7439-89-6	D	6	6	5.11E+03	1.21E+04	3.1E+05	NC	3.9E-02	2.3E+04	NC	5.2E-01
off	AOI B	INORG	Lead	7439-92-1	B2	6	6	2.30E+00	1.26E+01	8.0E+02	NC	1.6E-02	4.0E+02	NC	3.2E-02
off	AOI B	INORG	Manganese	7439-96-5	D	6	6	1.38E+02	6.82E+02	1.9E+04	NC	3.5E-02	1.8E+03	NC	3.9E-01

Table 2-4a: Sediment Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Industrial PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Industrial Criteria	Residential PRG-Based Criteria (mg/kg)		Ratio of Max Detect to Residential Criteria
off	AOI B	INORG	Nickel	7440-02-0	A	6	6	4.50E+00	1.12E+01	2.0E+04	NC	5.5E-04	1.6E+03	NC	7.2E-03
off	AOI B	INORG	Selenium	7782-49-2	D	6	1	6.70E-01	6.70E-01	5.1E+03	NC	1.3E-04	3.9E+02	NC	1.7E-03
off	AOI B	INORG	Vanadium	7440-62-2		6	6	4.30E+00	1.35E+01	1.0E+03	NC	1.3E-02	7.8E+01	NC	1.7E-01
off	AOI B	INORG	Zinc	7440-66-6	ID	6	6	1.72E+01	4.77E+02	3.1E+05	NC	1.6E-03	2.3E+04	NC	2.0E-02

Notes:

Only constituents detected in each area are shown.

PRGs (Preliminary Remediation Goals) - United States Environmental Protection Agency (USEPA). 2004. Region 9 Preliminary Remediation Goals. October.

The criteria for soil are the lower of the criteria at either the target cancer risk of 1E-5 or target hazard quotient of 1.

The Region 9 PRG criteria for Benzo(g,h,i)perylene are the criteria provided by the agency for Pyrene.

The Region 9 PRG criteria for Mercury are calculated by ENVIRON to account for the vapor inhalation pathway using:
USEPA Region 9 equations, RfC from IRIS, and chemical properties from USEPA's Soil Screening Guidance.

The criteria for Phenanthrene are the criteria provided by the agency for Pyrene.

The Region 9 PRG criteria for trichloroethene are derived using the toxicity values presented in the Region 9 PRGs (2000) and an ingestion rate adjusted to be consistent with the 2004 Region 9 PRG calculations.

The concentrations for the Xylene isomers (m/p and o) were summed before comparing to the criteria for Xylenes (total).

Ratios of concentration to the criteria greater than 1 are shaded in bold.

C - The criterion is based on cancer risk at the indicated cancer risk.

NC - The criterion is based on noncancer effects at the indicated hazard quotient.

Chem Group - chemical group

Carc Class - USEPA Weight-of-Evidence Cancer Classification

Table 2-4b: Sediment Samples Exceeding Screening Criteria
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Location	Sample ID	Sample Type	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/kg)	Qual	Industrial PRG-Based Criteria (mg/kg)	Ratio of Conc to Industrial PRG-Based Criteria	Residential PRG-Based Criteria (mg/kg)	Ratio of Conc to Residential PRG-Based Criteria
off	AOI B	SED-01	SED01-092208	N	09/22/08	SVOC	Benzo(a)pyrene	50-32-8	7.50E-01	J	2.1E+00	3.6E-01	6.2E-01	**1.2E+00**
off	AOI B	SED-01	SED01-092208	N	09/22/08	INORG	Arsenic	7440-38-2	7.10E+00		1.6E+01	4.5E-01	3.9E+00	**1.8E+00**
off	AOI B	SED-02	SED02-092208	N	09/22/08	SVOC	Benzo(a)pyrene	50-32-8	3.20E+00		2.1E+00	**1.5E+00**	6.2E-01	**5.1E+00**
off	AOI B	SED-02	SED02-092208	N	09/22/08	SVOC	Dibenz(a,h)anthracene	53-70-3	6.90E-01	J	2.1E+00	3.3E-01	6.2E-01	**1.1E+00**
off	AOI B	SED-02	SED02-092208	N	09/22/08	INORG	Arsenic	7440-38-2	4.40E+00		1.6E+01	2.8E-01	3.9E+00	**1.1E+00**
off	AOI B	SED-03	SED03-092308	N	09/23/08	INORG	Arsenic	7440-38-2	7.90E+00		1.6E+01	5.0E-01	3.9E+00	**2.0E+00**
off	AOI B	SED-05	SED05-092408	N	09/24/08	SVOC	Benzo(a)pyrene	50-32-8	2.90E+00		2.1E+00	**1.4E+00**	6.2E-01	**4.7E+00**
on	AOI C	SED-11	SED11-092608	N	09/26/08	INORG	Arsenic	7440-38-2	4.70E+00		1.6E+01	3.0E-01	3.9E+00	**1.2E+00**
on	AOI C	SED-12	SED12-092608	N	09/26/08	INORG	Arsenic	7440-38-2	7.60E+00		1.6E+01	4.8E-01	3.9E+00	**2.0E+00**
on	AOI C	SED-13	DUP02/092608	FD	09/26/08	INORG	Arsenic	7440-38-2	4.70E+00		1.6E+01	3.0E-01	3.9E+00	**1.2E+00**
on	AOI C	SED-13	DUP02/092608	FD	09/26/08	INORG	Iron	7439-89-6	2.51E+04		3.1E+05	8.2E-02	2.3E+04	**1.1E+00**
on	AOI C	SED-15	SED15-092608	N	09/26/08	INORG	Arsenic	7440-38-2	5.90E+00		1.6E+01	3.7E-01	3.9E+00	**1.5E+00**
on	SWMU 22	SED-07	SED07-092508	N	09/25/08	INORG	Aluminum	7429-90-5	9.02E+04		9.2E+05	9.8E-02	7.6E+04	**1.2E+00**
on	SWMU 22	SED-07	SED07-092508	N	09/25/08	INORG	Arsenic	7440-38-2	1.32E+01		1.6E+01	8.3E-01	3.9E+00	**3.4E+00**
on	SWMU 22	SED-08	SED08-092508	N	09/25/08	INORG	Arsenic	7440-38-2	5.90E+00		1.6E+01	3.7E-01	3.9E+00	**1.5E+00**
on	SWMU 22	SED-09	SED09-092508	N	09/25/08	INORG	Aluminum	7429-90-5	8.87E+04		9.2E+05	9.6E-02	7.6E+04	**1.2E+00**
on	SWMU 22	SED-09	SED09-092508	N	09/25/08	INORG	Arsenic	7440-38-2	4.90E+00	B	1.6E+01	3.1E-01	3.9E+00	**1.3E+00**

Table 3-1: Conceptual Site Model for Potential Human Exposures Bway Corporation, Cincinnati, Ohio					
Receptor Population	**Exposure Medium**	**Exposure Route**	**Possible Currently?**	**Possible in Future?**	**Comments**
On-Site					
Routine Workers	surface soil	incidental ingestion of and dermal contact with surface soil	Yes	Yes	The property is comprised of the: developed operational area; developed non-operational area; and, undeveloped eastern area. The developed operational portion of the property is covered either with buildings or concrete and asphalt making direct contact to soil unlikely. The developed non-operational area consists primarily of lawn, where potential exposure may occur during routine activities and during seasonal grass mowing. Potential exposures to soil in the undeveloped eastern portion of the property is unlikely. Potential exposures could occur in the developed areas without pavement and areas where pavement is removed in the future.
		inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	Yes	Yes	
		inhalation of soil-derived vapors that migrate through building foundations into indoor air	Yes	Yes	
	subsurface soil	inhalation of soil-derived vapors in ambient air	Yes	Yes	Potential exposure to subsurface soil vapors in ambient air is possible in areas without pavement and where pavement might be removed in the future.
		inhalation of soil-derived vapors that migrate through building foundations into indoor air	Yes	Yes	Potential exposure via vapor intrusion through cracks in building foundations into indoor air are possible if soil-derived vapors migrate through building foundations.
	groundwater	ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for drinking water	No	Yes	Currently, there are no groundwater wells at the Site. Potable water is obtained from the City of Cincinnati municipal system. As there is no current prohibition on groundwater use, installation and use of wells could occur in the future.
		incidental ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for purposes other than drinking water	No	Yes	
		inhalation of groundwater-derived vapors in ambient air	Yes	Yes	Potential exposure of routine workers to groundwater vapors in ambient air is possible.
		inhalation of groundwater-derived vapors that migrate through building foundations into indoor air	Yes	Yes	Potential indoor exposure is possible if groundwater-derived vapors migrate through building foundations.
Maintenance Workers	surface and subsurface soil	incidental ingestion of and dermal contact with soil; inhalation of soil-derived vapors and airborne particulates in work-space air	Yes	Yes	Potential exposure to soil in the developed operational area is possible during excavations for utility maintenance.
	groundwater	incidental ingestion of and dermal contact with exposed groundwater; inhalation of vapors from exposed groundwater in work-space air	No	No	The groundwater table in the developed operational portion of the facility is approximately 50 feet or greater, which is below the depth of the deepest utilities.
Construction Workers	surface and subsurface soil	incidental ingestion of and dermal contact with soil; inhalation of soil-derived vapors and airborne particulates in work-space air	No	Yes	Potential exposure of construction workers to soil may be possible where soil is exposed during any future redevelopment activities.
	groundwater	incidental ingestion of and dermal contact with exposed groundwater; inhalation of vapors from exposed groundwater in work-space air	No	No	The depth to groundwater in the developed area is approximately 50 feet or greater, which is below a reasonable building foundation depth.
Trespassers	surface soil	incidental ingestion of and dermal contact with surface soil	Yes	Yes	Access to the facility is controlled through fencing, physical constraints and 24 hour security. Potential exposure to surface soil is possible where soil is exposed. Potential exposure to subsurface soil vapors in ambient air is possible.
		inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	Yes	Yes	
	subsurface soil	inhalation of soil-derived vapors in ambient air	Yes	Yes	
	surface water	incidental ingestion, dermal contact, and inhalation of vapors from wading	Yes	Yes	Potential exposure to surface water and sediment in the historical debris area (AOI C) is possible. Potential exposure to surface water and sediment in the wastewater storage pond (within SWMU 22) is not reasonably expected. On-site surface water is not used for potable or nonpotable purposes.
	sediment	incidental ingestion of and dermal contact with sediment from wading	Yes	Yes	

Table 3-1: Conceptual Site Model for Potential Human Exposures Bway Corporation, Cincinnati, Ohio					
Receptor Population	**Exposure Medium**	**Exposure Route**	**Possible Currently?**	**Possible in Future?**	**Comments**
Off-Site					
Routine Workers	surface and subsurface soil	inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	Yes	Yes	The quarry site to the north of the site is currently inactive. There is a current industrial site to the east. There are no current industrial properties to the west. The properties to the south are currently residential. Industrial use of neighboring properties is possible in the future. Airborne exposures off-site are possible via windblown dust from exposed soil or excavation activities at the Site.
	groundwater	ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for drinking water	No	Yes	The results of the well search indicate one well, within the same aquifer system as the Site, may be present in the downgradient direction of the Facility. Currently, there are no industrial properties immediately downgradient. Industrial properties could be constructed in the future.
		incidental ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for purposes other than drinking water	No	Yes	
		inhalation of groundwater-derived vapors in ambient air	No	Yes	Potential exposure of routine workers to groundwater vapors in ambient air is possible in the future.
		inhalation of groundwater-derived vapors that migrate through building foundations into indoor air	No	Yes	Currently, there are no buildings immediately downgradient of the Site. Potential exposure to groundwater-derived vapor migrating to indoor air is possible in the future.
Maintenance Workers	groundwater	incidental ingestion of and dermal contact with exposed groundwater; inhalation of vapors from exposed groundwater in work-space air	Yes	Yes	Potential exposure to groundwater is possible in excavations where groundwater is encountered during utility maintenance.
Residents	surface and subsurface soil	inhalation of soil-derived vapors and airborne particulates (wind erosion) in ambient air	Yes	Yes	Airborne exposures off-site are possible via windblown dust from exposed soil or excavation activities at the Site.
	groundwater	ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for drinking water	Yes	Yes	The results of the well search indicate one well, within the same aquifer system as the Site, may be present in the downgradient direction of the Facility. Currently, there are no residential properties immediately downgradient.
		incidental ingestion of and dermal contact with groundwater and inhalation of groundwater-derived vapors during use of groundwater for purposes other than drinking water	Yes	Yes	
		inhalation of groundwater-derived vapors in ambient air	Yes	Yes	
		inhalation of groundwater-derived vapors that migrate through building foundations into indoor air	Yes	Yes	
Trespassers (to adjacent quarry pond)	surface water	incidental ingestion, dermal contact, and inhalation of vapors from swimming or wading	Yes	Yes	Groundwater and former and current storm sewer water discharges from the Facility to the adjacent quarry pond. Access to the quarry pond is controlled through fencing and physical constraints, however, unauthorized use by trespassers is possible. The pond is not used for potable or nonpotable purposes.
	sediment	incidental ingestion of and dermal contact with sediment from swimming or wading	Yes	Yes	

Table 4-1: Exposure Factors - Hypothetical Trespassers Bway Corporation, Cincinnati, Ohio					
		Adolescent Trespasser		Adult Trespasser	
Sediment Ingestion					
Ingestion Rate (mg/d)	IR	50	d	50	d
Conversion Factor (kg/mg)	CF	1E-06		1E-06	
Fraction Contacted (unitless)	FC	1.0		1.0	
Exposure Frequency (d/yr)	EF	24	d	24	d
Exposure Duration (yr)	ED	10	d	30	d
Body Weight (kg-bw)	BW	51	b	70	b
Averaging Time, cancer (d)	AT_c	25,550	a	25,550	a
Averaging Time, noncancer (d)	AT_{nc}	3,650	a	10,950	a
Sediment Dermal Contact					
Adherence Factor (mg/cm^2)	AF	0.2	c	0.07	c
Skin Surface Area (cm^2/d)	SA	3,950	a,d	9,000	b
Conversion Factor (kg/mg)	CF	1E-06		1E-06	
Fraction Contacted (unitless)	FC	1.0		1.0	
Exposure Frequency (d/yr)	EF	24	d	24	d
Exposure Duration (yr)	ED	10	d	30	d
Body Weight (kg-bw)	BW	51	b	70	b
Averaging Time, cancer (d)	AT_c	25,550	a	25,550	a
Averaging Time, noncancer (d)	AT_{nc}	3,650	a	10,950	a
Surface Water Incidental Ingestion					
Drinking Rate (L/hr per event)	DR	0.005	d	0.005	d
Exposure Time (hr)	ET	1	d	1	d
Exposure Frequency (d/yr)	EF	24	d	24	d
Expoure Duration (yr)	ED	10	d	30	d
Body Weight (kg-bw)	BW	51	b	70	b
Averaging Time, cancer (d)	AT_c	25,550	a	25,550	a
Averaging Time, noncancer (d)	AT_{nc}	3,650	a	10,950	a
Surface Water Dermal Contact [1]					
Skin Surface Area (cm^2)	SA	3,950	a, d	9,000	b
Exposure time (hr/d)	EV	1	d	1	d
Exposure Frequency (d/yr)	EF	24	d	24	d
Expoure Duration (yr)	ED	10	d	30	d
Body Weight (kg-bw)	BW	51	b	70	b
Averaging Time, cancer (d)	AT_c	25,550	a	25,550	a
Averaging Time, noncancer (d)	AT_{nc}	3,650	a	10,950	a

Table 4-1: Exposure Factors - Hypothetical Trespassers
Bway Corporation, Cincinnati, Ohio

		Adolescent Trespasser		Adult Trespasser	
Surface Water Vapor Inhalation [1]					
Exposure Frequency (d/yr)	EF	24	d	24	d
Exposure Duration (yr)	ED	10	d	30	d
Averaging Time, cancer (d)	AT_c	25,550	a	25,550	a
Averaging Time, noncancer (d)	AT_{nc}	3,650	a	10,950	a
Note:					

[1] Contact rates are based on wading in streams/ponds.

References:

a. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part A) Interim Final (EPA 1989)

b. Exposure Factors Handbook (EPA 1997)

c. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual: Part E, Supplemental Guidance for Dermal Risk Assessment, Interim Final (EPA 2001)

d. Based on professional judgment and site-specific considerations as follows:

- Trespasser: The Trespasser is assumed to be an adolescent youth or adult, and the body weight and skin surface area are selected accordingly. Exposure frequency and duration are based on two events/week for 3 months when the air temperature is above 70 F for 10 years (Cincinnati data, NOAA 2004). Exposure time in the ponds at the site is assumed to be 1 hour/event.

Table 4-2: Upper-Bound Cumulative Cancer Risk and HI Estimates for Trespasser Exposures
Bway Corporation, Cincinnati, Ohio

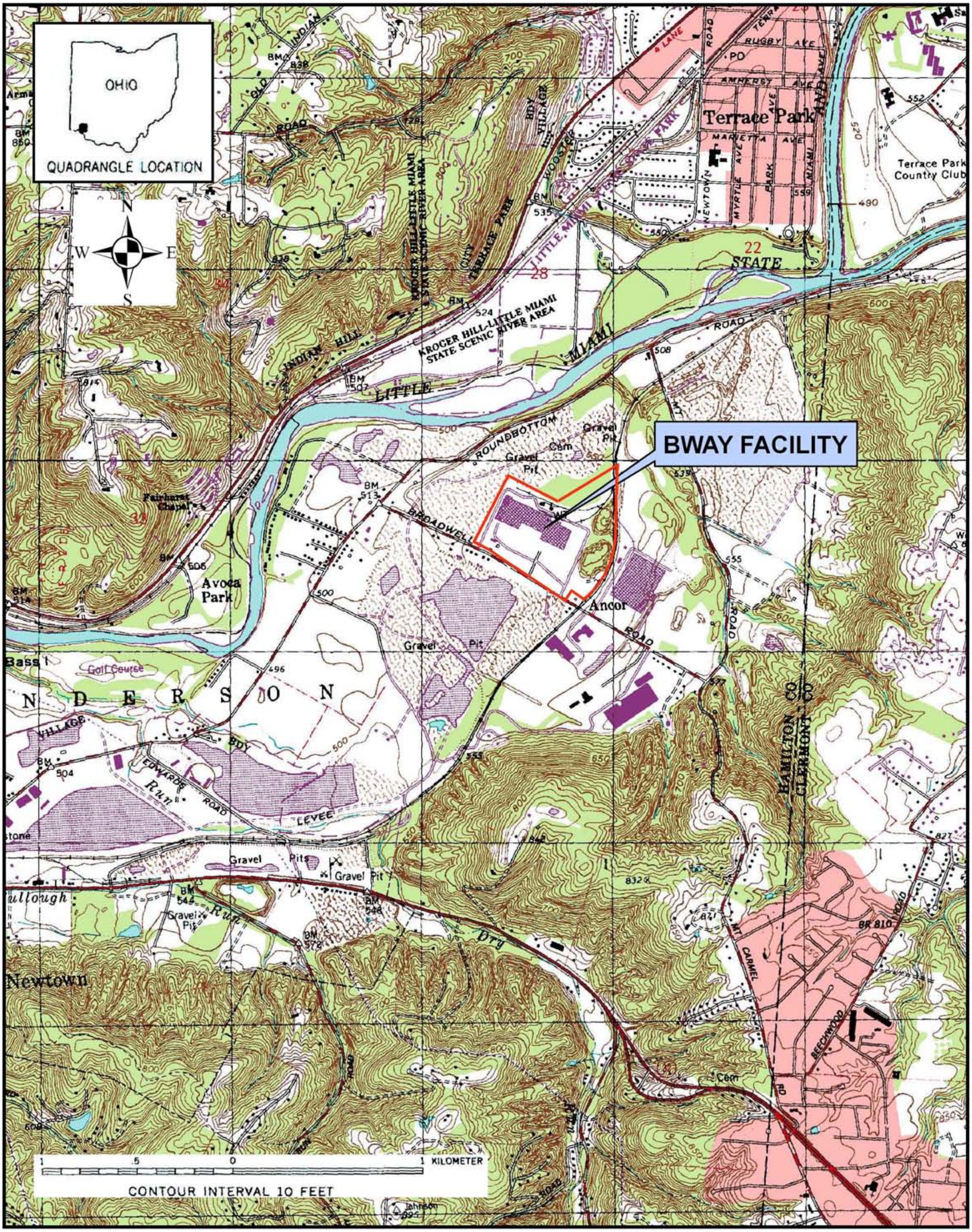
	Adolescent Trespasser Contact		Adult Trespasser Contact	
Area	**Risk**	**HI**	**Risk**	**HI**
AOI B	1E-06	1E-01	3E-06	1E-01
AOI C	3E-07	1E-02	1E-06	1E-02
SWMU 22	3E-07	8E-02	6E-07	8E-02

Notes:

Trespassers are assumed to be exposed to both sediment and surface water.

Values in bold and shaded in gray exceed the USEPA's cumulative cancer risk or HI limits of 1E-4 and 1, respectively.

Figures



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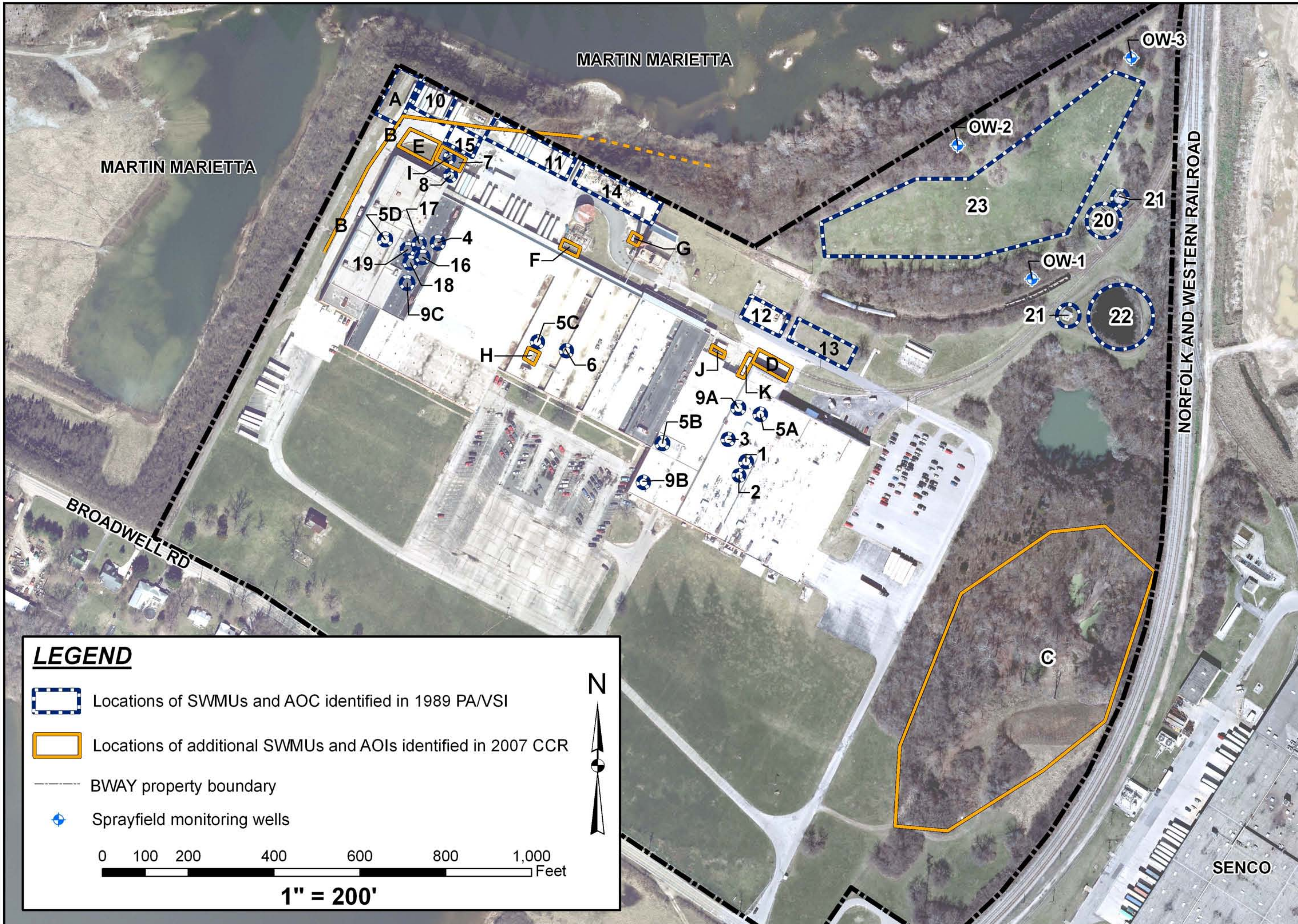
PROJECT: BWAY - RCRA Corrective Action	FIGURE NO.: 1	DATE: 12/17/08	The Payne Firm, Inc. Environmental Consultants Cincinnati, OH / Cleveland, OH Chicago, IL / Troy, NY
TITLE: BWAY Facility Location	DRAWN BY: JAG	REQUESTED BY: KDK	
	PROJECT NO.: 654.13.07		

REFERENCE: United States Geologic Survey (USGS) 7.5 Minute Quadrangle Map for Maderia, Ohio and Withamsville, Ohio (revised, 1999).



G:\GIS_Projects\GIS_0654.13.00_Bway_CA\MXDs\CA725\Figure 2 CA725.mxd

The Payne Firm, Inc.
Environmental Consultants
Cincinnati, OH / Cleveland, OH
Chicago, IL / Troy, NY

PROJECT: BWAY - RCRA Corrective Action
TITLE: Locations of SWMUs, AOCs, and AOIs
REFERENCE: 2006 Orthophoto Courtesy CAGIS; 1989 PA/VSI Exhibits 3 and 4

FIGURE NO. 2
DATE 12/17/08
DRAWN BY JAG
REQUESTED BY KDK
PROJECT NO. 654.13.07

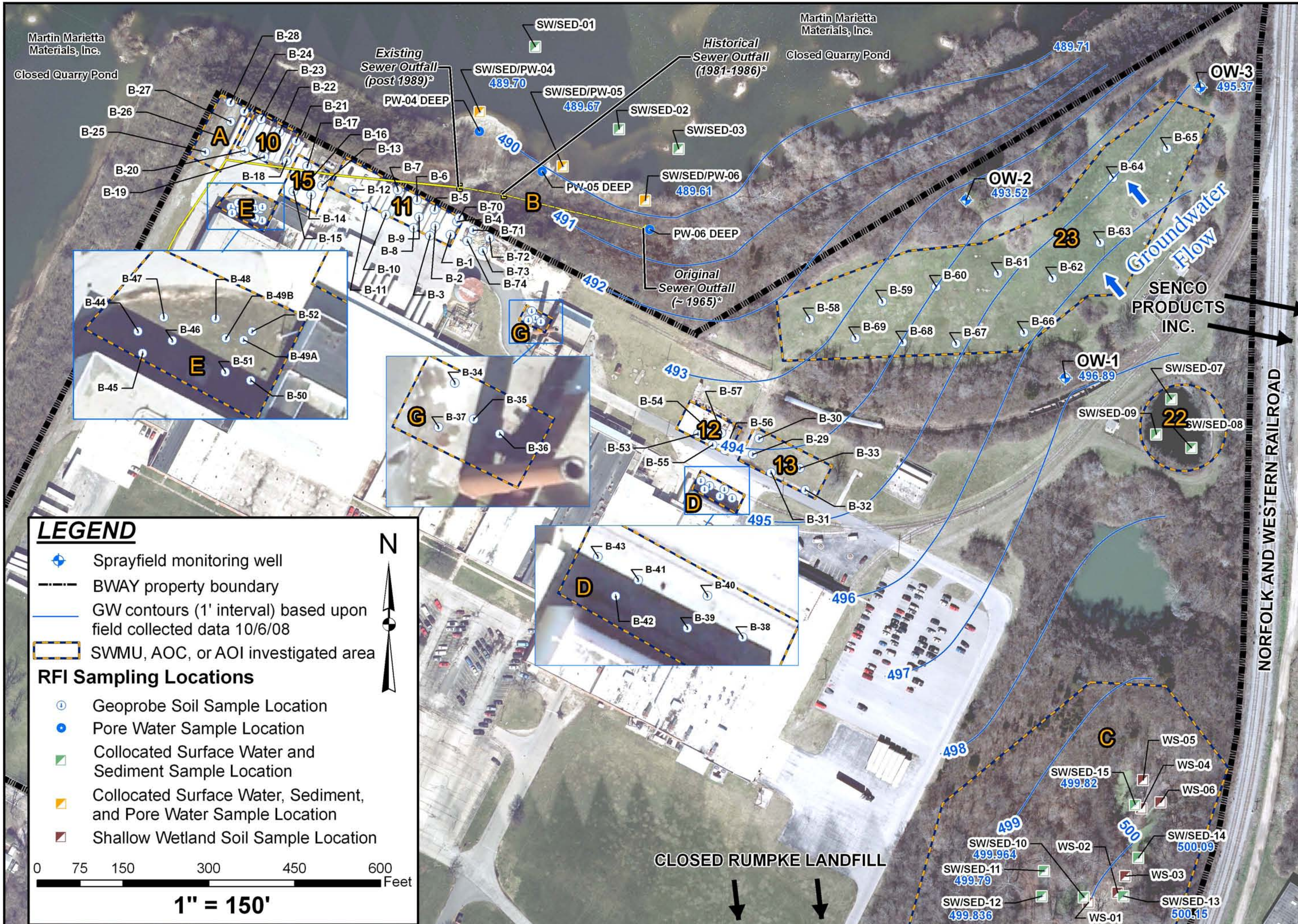


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FIGURE NO.	3
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PROJECT NO.	654.13.07
PROJECT	BWAY - RCRA Corrective Action
TITLE	RFI Sampling Locations and Groundwater Contours
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Appendix A

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)
Current Human Exposures Under Control

Facility Name:	Bway Corporation
Facility Address:	8200 Broadwell Road, Cincinnati, Ohio
Facility EPA ID #:	OHD 004 253 225

APPENDIX A

SUPPORTING INFORMATION AND CALCULATIONS

CONTENTS

A-1	INTRODUCTION	A-1
A-2	DATA PREPARATION	A-2
A-3	EXPOSURE ASSESSMENT	A-3
A-4	TOXICITY ASSESSMENT	A-4
	A-4.1 Cancer Toxicity Values	A-4
	A-4.2 Noncancer Toxicity Values	A-5
	A-4.3 Extrapolation of Toxicity Values	A-5
A-5	CALCULATION OF VAPOR MIGRATION TO INDOOR AIR CRITERIA	A-6
A-6	RISK ESTIMATES FOR HYPOTHETICAL TRESPASSER EXPOSURES	A-9
	A-6.1 Surface Water Contact	A-10
	A-6.2 Sediment Contact	A-12
	A-6.3 Cumulative Risk Estimates	A-13
A-7	REFERENCES	A-14

ATTACHMENTS

Attachment A1: Toxicity Values and Physical Chemical Parameter Data
Attachment A2: Calculation of Vapor Migration to Indoor Air Criteria
Attachment A3: Risk Estimates for Hypothetical Trespasser Exposures

A-1 INTRODUCTION

This appendix provides information and calculations in support of the Resource Conservation and Recovery Act (RCRA) CA725 Environmental Indicator (EI) Determination for the Bway Corporation (Bway) site in Cincinnati, Ohio. Specifically, the information in this appendix presents the following information referenced in the CA725 EI Determination form:

- Data Preparation
- Exposure Assessment
- Toxicity Assessment
- Calculation of Vapor Migration to Indoor Air Criteria Based on Protection of Indoor Workers
- Risk Estimates for Hypothetical Trespasser Exposures

Referenced toxicity values, physical chemical data, model input parameters, and calculation sheets are provided in attachments to this Appendix.

A-2 DATA PREPARATION

The following procedures were used to prepare data collected as part of Bway's ongoing RCRA Facility Investigation (RFI) to support an evaluation of potential human exposures. These procedures, which are based on USEPA guidance on human health risk assessment (USEPA 1989), are as follows:

- constituent concentrations qualified as not detected (i.e., U or UJ-qualified data) during data validation are evaluated as non-detects;
- constituent concentrations qualified as not usable (i.e., R-qualified data) during data validation are not included in the analysis;
- concentrations qualified as estimated (i.e., J-qualified data) are included for quantitative assessment;
- concentrations in duplicate field samples are averaged to obtain a representative concentration for the sample location. When a constituent was detected in only one sample of a duplicate pair, the average of the detected concentration and one-half the reporting limit is used in further calculations; and
- the concentrations of methylphenol (total) in a sample are the sums of the concentrations of the detected isomers and half the quantitation limits of isomers not detected in the sample but detected in the same matrix at the Site. If no isomer is detected in a sample, the constituent is considered to be not detected in the sample.

A-3 EXPOSURE ASSESSMENT

For potential exposures discussed in this Appendix, exposure is quantified in terms of a dose, as follows:

$$Dose = Concentration \cdot Intake$$

The dose for evaluating cancer risk is averaged over a lifetime and is called the lifetime average daily dose (LADD). For evaluating long-term (or chronic) noncancer effects, the dose is averaged over the duration of potential exposure and is called the average daily dose (ADD). The concentration term in the dose equation refers to the average chemical concentration in an environmental medium to which a population is exposed over a specified duration. The intake term refers to the intake rate of the contaminated environmental medium, which is a function of the magnitude, frequency, and duration of exposure. Potential exposures via inhalation are quantified as an average daily concentration in air. The methods for estimating the concentration term and applicable fate and transport models are discussed in Sections A-5 and A-6 for potential indoor worker exposure to vapor migrating into indoor air and trespasser exposure to surface water and sediment, respectively. The exposure factors that are used to quantify the magnitude, frequency, and duration of potential exposures are also discussed in Sections A-5 and A-6.

A-4 TOXICITY ASSESSMENT

A toxicity assessment identifies potential adverse health effects that are associated with exposure to chemicals and determines the dose-response relationship between exposure and the occurrence of adverse effects. The toxicity values used in supporting calculations for the CA725 were compiled according to USEPA's hierarchy of sources (USEPA 2003b):

1. Integrated Risk Information System (IRIS);
2. Provisional Peer Reviewed Toxicity Values (PPRTV); and
3. Other Toxicity Values (e.g., NCEA provisional values and ATSDR MRLs).

When a toxicity value was not available from the first two tiers of the hierarchy, other USEPA and non-USEPA sources (e.g., ATSDR) of toxicity values were consulted. The toxicity values used in supporting calculations for the CA725 and their sources are summarized in Attachment A1, and are discussed below. These values are current as of December 2008.

A-4.1 Cancer Toxicity Values

USEPA considers chemicals belonging to the following USEPA cancer weight-of-evidence groups as human carcinogens:

Group A	Known Human Carcinogen: Sufficient evidence of carcinogenicity in humans
Group B1	Probable Human Carcinogen: Limited evidence of carcinogenicity in humans
Group B2	Probable Human Carcinogen: Sufficient evidence of carcinogenicity in animals with inadequate or lack of evidence in humans
Group C	Possible Human Carcinogen: Limited evidence of carcinogenicity in animals and inadequate or lack of evidence in humans

As shown in Attachment A1, USEPA has designated some of the constituents as Group B2 or Group C, which means that USEPA acknowledges there is either inadequate evidence or a lack of evidence that these constituents actually cause cancer in humans. Therefore, evaluating these constituents as human carcinogens is a conservative approach.

The USEPA-derived cancer slope factors (SFs) and inhalation unit risk factors (URFs) used in this analysis and their sources are shown in Attachment A1. The oral SFs and inhalation URFs represent 95% upper confidence bounds on the probability of getting cancer over a lifetime per unit dose. As recognized by USEPA, there is significant scientific evidence that some of the SFs and URFs may be overly conservative and may ignore the potential existence of threshold doses. Nonetheless, they are used here as conservative assessment tools.

A-4.2 Noncancer Toxicity Values

The USEPA-derived chronic reference doses (RfDs) and chronic inhalation reference concentrations (RfCs) used in this analysis and their sources are shown in Attachment A1.

The oral RfDs and inhalation RfCs represent conservative estimates of the daily exposure to the human population, including sensitive subpopulations (e.g., children), which are likely to be without an appreciable risk of deleterious effects during a lifetime. These RfDs and RfCs typically incorporate several safety factors to account for uncertainties in their derivation, which, in combination, often result in overall uncertainty factors of 1,000 or more. Furthermore, for many chemicals, there is significant scientific debate about the validity of these RfDs and RfCs, and the association of these doses and concentrations to potential adverse health consequences. Nonetheless, the RfDs and RfCs are used here as conservative assessment tools.

A-4.3 Extrapolation of Toxicity Values

The USEPA sources of toxicity values listed above do not provide dermal toxicity values for any of the chemicals. Therefore, oral toxicity values (i.e., oral SFs and RfDs) are used as dermal toxicity values in this risk analysis. Adjustments to the oral toxicity values, where appropriate, are made in this route-to-route extrapolation following USEPA guidance (USEPA 2004b).

The USEPA sources of toxicity values listed above do not provide inhalation toxicity values (URFs and RfCs) for all of the chemicals. For a constituent that has no inhalation toxicity values, the oral SF and/or RfD, if available, is converted to an URF and/or RfC using default USEPA assumptions (USEPA 1997), unless USEPA has advised against such extrapolation for a particular chemical.

A-5 CALCULATION OF VAPOR MIGRATION TO INDOOR AIR CRITERIA

As discussed under Question 2 of the CA725, risk-based screening levels were calculated for evaluating potential vapor migration from soil and groundwater to indoor air based on protection of indoor workers. These risk-based criteria (RBCs) are calculated based on conservative exposure factors for indoor workers and a Target Cancer Risk Level (TCRL) of 10^{-5} for carcinogenic constituents and a target HQ of 1 for non-carcinogenic constituents.

The RBCs are calculated using unit risk factors (URFs) and reference concentrations (RfCs) are calculated using equivalent forms of the inhalation risk equations that make use of site-specific vapor intrusion RBCs for soil and groundwater as follows:

$$RBC_c = \frac{TR \cdot AT_c}{URF \cdot EF \cdot ED \cdot \mathrm{C}_{\mathrm{building}}}$$

$$RBC_{nc} = \frac{THQ \cdot AT_{nc}}{\frac{1}{RfC} \cdot EF \cdot ED \cdot \mathrm{C}_{\mathrm{building}}}$$

where:

$C_{building}$ = Chemical concentration in indoor air (mg/m^3)
EF = Exposure frequency (250 days/year),
ED = Exposure duration (25 years)
AT_c = Averaging time cancer (25,550 days)
AT_{nc} = Averaging time noncancer (9,125 days)
TR = Target risk (10^{-5})
THQ = Target hazard quotient (1)

The indoor air concentrations in the above equations are estimated using the following relationships described by Johnson and Ettinger (1991):

$$C_{building} = \alpha\, C_{source}$$

where $C_{building}$ is the indoor air concentration, C_{source} is the source vapor concentrations, and α is an attenuation coefficient that is given by the following equation:

$$\alpha = \frac{\left[\dfrac{D_T^{eff} A_B}{Q_{building} L_T}\right]\exp\left(\dfrac{Q_{soil} L_{crack}}{D^{crack} A_{crack}}\right)}{\exp\left(\dfrac{Q_{soil} L_{crack}}{D^{crack} A_{crack}}\right)+\left[\dfrac{D_T^{eff} A_B}{Q_{building} L_T}\right]+\left[\dfrac{D_T^{eff} A_B}{Q_{soil} L_T}\right]\left[\exp\left(\dfrac{Q_{soil} L_{crack}}{D^{crack} A_{crack}}\right)-1\right]}$$

Derivation of this equation and definition of the equation parameters can be found in Johnson and Ettinger's 1991 journal paper, and therefore, is not repeated here.

The source vapor concentration C_{source} for a constituent in soil is calculated from the constituent's concentration in soil C_{soil} based on three-phase equilibrium, as follows:

$$C_{source} = C_{soil}\left(\frac{K_d}{H}+\frac{\theta_w}{\rho_b H}+\frac{\theta_a}{\rho_b}\right)^{-1}$$

where K_d is the equilibrium-partition coefficient (estimated as the product of the organic carbon partition coefficient K_{oc} and the soil organic carbon fraction f_{oc}), H is the Henry's law constant, θ_w is the water-filled soil porosity, ρ_b is the soil bulk density, and θ_a is the air-filled soil porosity.

The source vapor concentration for a constituent in ground water is calculated from the constituent's concentration in ground water C_{gw} using Henry's law, as follows:

$$C_{source} = H \cdot C_{gw}$$

For the calculation of the RBCs referenced in the above equations, the soil and groundwater concentrations used for the C_{soil} and C_{gw} terms are assumed to be unity. That is, soil RBCs are calculated with an initial hypothetical soil concentration of 1 mg/kg-soil, while the RBCs for groundwater are calculated with an initial hypothetical concentration of 1 mg/L-water.

The effective diffusion coefficient term D_T^{eff} in the equation for the attenuation coefficient α is calculated based on a "sand" soil type. The soil-water profile in the vadose zone is estimated using the van Genuchten soil-water retention curve, and water retention parameters appropriate for sand. These parameters and the resulting soil-water profile in the vadose zone are shown in Attachment A2.

The distance between ground water and a building foundation L_T is estimated to be approximately 13 m, which is conservatively based on the average approximate depth to groundwater at the Site. The remaining parameters in the equation for α, which relate to the characteristics of a hypothetical commercial/industrial building and the distance between contaminated soil and the building foundation L_T, are based on conservative default values that the Michigan Department of Environmental Quality (2002) used in deriving the Michigan Part 201 generic vapor intrusion criteria for commercial/industrial sites. The MDEQ default values for these parameters are used because USEPA and Ohio EPA guidance does not provide default values for these parameters for commercial/industrial buildings. These values are shown in Attachment A2; their bases are discussed in MDEQ's Technical Support Document (1998). Computations of the RBCs are presented in Attachment A2.

A-6 RISK ESTIMATES FOR HYPOTHETICAL TRESPASSER EXPOSURES

As discussed under Question 4 of the CA725, risk estimates were calculated to evaluate the significance of potential exposures of hypothetical adolescent (age 9 to 18) and adult trespassers via contact with on- and off-site surface water and sediment. The potential exposure routes were described in the conceptual site model (Table 3-1 of the CA725) and consist of incidental ingestion and dermal contact with surface water and sediment and inhalation of vapors from surface water. The cancer risk and HQ estimates for hypothetical trespasser exposure to surface water and sediment are calculated as described below based on the exposure factors described in Table 4-1 of the CA725. Calculation of the cancer and noncancer single chemical risk estimates and supporting calculations for each route of exposure is provided in Attachment A3. Reasonable maximum exposures (RME) are conservatively estimated in this evaluation by using the maximum detected concentrations at each area.

The cancer risk associated with potential direct contact exposure to a carcinogenic chemical is calculated by multiplying an estimate of the LADD for a particular exposure scenario by the cancer slope factor (SF) for the chemical, as follows:

$$\text{Risk} = \text{LADD} \cdot \text{SF}$$

The noncancer hazard quotient (HQ) associated with potential direct contact exposure to a noncarcinogenic chemical is calculated by dividing an estimate of the ADD for a particular exposure scenario by the reference dose (RfD) for the chemical, as follows:

$$\text{HQ} = \frac{\text{ADD}}{\text{RfD}}$$

The calculation of risk and HQ associated with potential inhalation of vapor exposure is described below.

A-6.1 Surface Water Contact

The LADD and ADD for surface water ingestion ($LADD_{ing}$ *and* ADD_{ing}, respectively) are calculated as follows:

$$LADD_{ing} = C_{sw} \cdot \frac{IR \cdot FC \cdot EF \cdot ED}{BW \cdot AT_c}$$

$$ADD_{ing} = C_{sw} \cdot \frac{IR \cdot FC \cdot EF \cdot ED}{BW \cdot AT_{nc}}$$

The LADD and ADD for surface water dermal contact ($LADD_{derm}$ and ADD_{derm}, respectively) are calculated as follows:

$$LADD_{derm} = C_{sw} \cdot \frac{SA \cdot EF \cdot ED \cdot FC}{BW \cdot AT_c} \cdot DA$$

$$ADD_{derm} = C_{sw} \cdot \frac{SA \cdot EF \cdot ED \cdot FC}{BW \cdot AT_{nc}} \cdot DA$$

where C_{sw} is the constituent concentration in surface water, *DA* is the chemical-specific dermal absorption factor, *FC* is the fraction contacted, *EF* is the exposure frequency, *ED* is the exposure duration, *BW* is the body weight, *AT* is the averaging time, *SA* is the surface area.

The absorbed dose (*DA*) for organic chemicals is estimated using a nonsteady-state approach (USEPA 2004b), which is more conservative than the steady-state approach (USEPA 1989), particularly for hydrophobic chemicals and is not repeated here.

For the vapor inhalation route, the inhalation cancer risk is calculated using the chemical concentration in air (C_{air}) and the URF, as follows:

$$\mathrm{Risk} = \mathrm{C_{air}} \cdot \mathrm{URF} \cdot \frac{\mathrm{EF} \cdot \mathrm{ED}}{\mathrm{AT}}$$

where EF is exposure frequency, ED is exposure duration, and AT is averaging time.

For the vapor inhalation route, the inhalation HQ is calculated using C_{air} and the RfC, as follows:

$$\mathrm{HQ} = \frac{\mathrm{C_{air}}}{\mathrm{RfC}} \cdot \frac{\mathrm{EF} \cdot \mathrm{ED}}{\mathrm{AT}}$$

where C_{air} is the product of the normalized vapor flux (J_L) and the normalized air concentration (C/Q), which are calculated as described below.

The normalized vapor flux J_L of a chemical is estimated using an overall mass transfer coefficient (K_L) that is recommended by USEPA (1995):

$$J_L = K_L = \left(\frac{1}{k_l} + \frac{1}{H\,k_g} \right)^{-1}$$

where H is the Henry's law constant, and k_l and k_g are the liquid-phase and gas-phase mass transfer coefficients given by the following:

$$k_l = \left(\frac{MW_o}{MW} \right)^{0.5} \left(\frac{T}{298K} \right) k_{l,o}$$

$$k_g = \left(\frac{MW_w}{MW} \right)^{0.335} \left(\frac{T}{298K} \right)^{1.005} k_{g,w}$$

where MW, MW_o, and MW_w are the molecular weights of the chemical, oxygen, and water, T is the absolute temperature of water, $k_{l,o}$ is the liquid-phase mass transfer coefficient for oxygen (0.002 cm/s), and $k_{g,w}$ is the gas-phase mass transfer coefficient for water vapor (0.833 cm/s).

The *C/Q* term is a normalized air concentration estimated using the empirical correlations presented in USEPA's *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (USEPA 2002), conservatively assuming a square source area of 48 acres (the approximate total cumulative area of the off-site quarry pond and the on-site surface water bodies), and correlation coefficients for the Cleveland, Ohio meteorological area. Derivation of these equations and definition of the equation parameters can be found in Appendix D of the 2002 USEPA Supplemental Soil Screening Guidance, and therefore, are not repeated here.

A-6.2 Sediment Contact

The LADD and ADD ($LADD_{ing}$ and ADD_{ing}, respectively) for sediment ingestion are calculated as follows:

$$LADD_{ing} = C_{sed} \cdot \frac{IR \cdot FC \cdot EF \cdot ED}{BW \cdot AT_c}$$

$$ADD_{ing} = C_{sed} \cdot \frac{IR \cdot FC \cdot EF \cdot ED}{BW \cdot AT_{nc}}$$

The LADD and ADD ($LADD_{derm}$ and ADD_{derm}, respectively) for sediment dermal contact are calculated as follows:

$$LADD_{derm} = C_{sed} \cdot \frac{SA \cdot AF \cdot ABS_{derm} \cdot FC \cdot EF \cdot ED}{BW \cdot AT_c}$$

$$ADD_{derm} = C_{sed} \cdot \frac{SA \cdot AF \cdot ABS_{derm} \cdot FC \cdot EF \cdot ED}{BW \cdot AT_{nc}}$$

where C_{sed} is the constituent concentration in sediment, IR is the ingestion rate, FC is the fraction contacted, EF is the exposure frequency, ED is the exposure duration, BW is the body weight, AT is the averaging time, SA is the surface area, AF is the adherence factor, and ABS_{derm} is the chemical-specific dermal absorption factor.

A-6.3 Cumulative Risk Estimates

The potential cancer risk and noncancer effects that may result from exposure to the combination of constituents at an area are estimated following USEPA guidance (1989), as follows:

$$\text{Cumulative Risk} = \sum_i \text{Risk}_i$$

$$\text{Hazard Index} = \sum_i \text{HQ}_i$$

where:

Risk_i = estimated cancer risk for the *i*th constituent

HQ_i = hazard quotient for the *i*th constituent

As discussed under Question 4 of the CA725, the cumulative cancer risk and noncancer hazard index (HI) estimates for a trespasser conservatively assumed exposure to both sediment and surface water. The results of the cumulative risk analysis are provided as Table 4-2 of the CA725.

This approach streamlines the evaluation, but may result in estimates of cumulative cancer and noncancer risks that are more conservative than necessary. For example, different chemicals may cause different and unrelated health effects, so summing the HQs for their individual effects would overestimate the significance of their combined effect.

A-7 REFERENCES

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ATTACHMENT A1

Toxicity Values and Physical Chemical Parameter Data

Attachment A1: Physical and Chemical Properties
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	Molecular Weight, MW (g/mole)			Organic Carbon Partition Coefficient, K_{oc} (L/kg)			Partition Coefficient for Soil, K_d (L/kg)			Henry's Law Constant and Reference Temperature H (unitless) and Temp (°C)				Solubility, s (mg/L)			Vapor Pressure, VP (mm Hg)			Diffusivity in Air, D_{air} (m^2/d)			Diffusivity in Water, D_{water} (m^2/d)			Dermal Permeability Coefficient, K_p (cm/hr)			Dermal Absorption Fraction, ABS_d (unitless)			Fraction Absorbed, FA (unitless)			Enthalpy of Vaporization at Normal Boiling Point, $\Delta H_{v,b}$ (cal/mol)			Critical Temperature, T_C (Kelvin)			Normal Boiling Point, T_B (Kelvin)		
			Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Temp	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes
VOC	Acetone	67-64-1	5.8E+01	50.1		5.8E-01	44	82				1.6E-03	2.5E+01	44		1.0E+06	44		2.3E+02	50.1	92	1.1E+00	44		9.8E-05	44		5.2E-04	44	115		62		1.0E+00	62	114	7.0E+03	44	118	5.1E+02	44	118	3.3E+02	44	118
VOC	Acetonitrile	75-05-8	4.1E+01	50.1		6.4E-01	1	111				1.4E-03	2.0E+01	50.1	92, 123	1.0E+06	50.1	92	9.1E+01	50.1	92	1.1E+00	40		1.5E-04	40		5.6E-04	1	115		62		1.0E+00	62	114	7.1E+03	70		5.5E+02	70		3.5E+02	70	
VOC	Acrolein	107-02-8	5.6E+01	50.1		1.0E+00	1	111				5.0E-03	2.0E+01	50.1	92, 123	2.1E+05	50.1	92	2.7E+02	50.1	92	9.5E-01	40		1.0E-04	40		6.7E-04	1	115		62		1.0E+00	62		6.7E+03	70		5.1E+02	70		3.3E+02	70	
VOC	Acrylonitrile	107-13-1	5.3E+01	50.1		2.2E-01	1	111				4.2E-03	2.0E+01	50.1	92, 123	7.4E+04	50.1	92	1.1E+02	50.1	92	1.0E+00	40		1.1E-04	40		2.0E-04	1	115		62		1.0E+00	62		7.8E+03	70		5.2E+02	70		3.5E+02	70	
VOC	Benzene	71-43-2	7.8E+01	50.1		5.8E+01	44	111				2.3E-01	2.5E+01	44		1.8E+03	44		9.5E+01	50.1	92	7.6E-01	44		8.5E-05	44		1.5E-02	44	115		62		1.0E+00	62		7.3E+03	44	118	5.6E+02	44	118	3.5E+02	44	118
VOC	Bromodichloromethane	75-27-4	1.6E+02	50.1		5.5E+01	44	111				6.6E-02	2.5E+01	44		6.7E+03	44		5.0E+01	50.1	92	2.6E-01	44		9.2E-05	44		4.7E-03	44	115		62		1.0E+00	62		7.8E+03	44	118	5.9E+02	44	118	3.6E+02	44	118
VOC	Bromoform	75-25-2	2.5E+02	50.1		8.7E+01	44	111				2.2E-02	2.5E+01	44		3.1E+03	44		5.5E+00	50.1	92	1.3E-01	44		8.9E-05	44		2.2E-03	44	115		62		1.0E+00	62		9.5E+03	44	118	7.0E+02	44	118	4.2E+02	44	118
VOC	Bromomethane	74-83-9	9.5E+01	50.1		1.0E+01	44	111				2.6E-01	2.5E+01	44		1.5E+04	44		1.6E+03	50.1	92	6.3E-01	44		1.0E-04	44		2.8E-03	44	115		62		1.0E+00	62		5.7E+03	44	118	4.7E+02	44	118	2.8E+02	44	118
VOC	2-Butanone	78-93-3	7.2E+01	50.1		2.0E+00	69	111				2.3E-03	2.0E+01	50.1	92, 123	2.2E+05	50.2		9.5E+01	50.1	92	7.0E-01	69		8.5E-05	69		9.6E-04	69	115		62		1.0E+00	62		7.5E+03	70		5.4E+02	70		3.5E+02	70	
VOC	Carbon Disulfide	75-15-0	7.6E+01	50.1		4.6E+01	44	111				1.2E+00	2.5E+01	44		1.2E+03	44		3.6E+02	50.1	92	9.0E-01	44		8.6E-05	44		1.2E-02	44	115		62		1.0E+00	62		6.4E+03	44	118	5.5E+02	44	118	3.2E+02	44	118
VOC	Carbon Tetrachloride	56-23-5	1.5E+02	50.1		1.7E+02	44	111				1.3E+00	2.5E+01	44		7.9E+02	44		1.2E+02	50.1	92	6.7E-01	44		7.6E-05	44		1.4E-02	44	115		62		1.0E+00	62		7.1E+03	44	118	5.6E+02	44	118	3.5E+02	44	118
VOC	2-Chloro-1,3-butadiene	126-99-8	8.9E+01	50.1		3.4E+00	1	111				1.3E+00	2.0E+01	1	55, 123	1.7E+03	50.1	90	2.1E+02	50.1	90	8.6E-01	40		8.6E-05	40		1.2E-03	1	115		62		1.0E+00	62	114	8.1E+03	70		5.3E+02	70		3.3E+02	70	
VOC	3-Chloro-1-propene	107-05-1	7.7E+01	50.1		6.9E+00	1	111				4.5E-01	2.0E+01	50.1	92, 123	3.4E+03	50.1	92	3.7E+02	50.1	92	6.9E-01	40		6.9E-05	40		2.5E-03	1	115		62		1.0E+00	62										
VOC	Chlorobenzene	108-90-7	1.1E+02	50.1		2.2E+02	44	111				1.5E-01	2.5E+01	44		4.7E+02	44		1.2E+01	50.1	92	6.3E-01	44		7.5E-05	44		2.9E-02	44	115		62		1.0E+00	62		8.4E+03	44	118	6.3E+02	44	118	4.0E+02	44	118
VOC	Chloroethane	75-00-3	6.5E+01	50.1		1.6E+01	69	111				3.6E-01	2.0E+01	50.1	92, 123	5.7E+03	50.1	92	1.0E+03	50.1	92	2.3E+00	69		9.9E-05	69		6.1E-03	69	115		62		1.0E+00	62		5.9E+03	70		4.6E+02	70		2.9E+02	70	
VOC	Chloroform	67-66-3	1.2E+02	50.1		4.0E+01	44	111				1.5E-01	2.5E+01	44		7.9E+03	44		2.0E+02	50.1	92	9.0E-01	44		8.6E-05	44		6.3E-03	44	115		62		1.0E+00	62		7.0E+03	44	118	5.4E+02	44	118	3.3E+02	44	118
VOC	Chloromethane	74-87-3	5.0E+01	50.1		4.0E+01	69	111				3.6E-01	2.0E+01	50.1	92, 123	5.3E+03	50.1	92	4.3E+03	50.1	92	1.1E+00	69		5.6E-05	69		1.5E-02	69	115		62		1.0E+00	62		5.1E+03	70		4.2E+02	70		2.5E+02	70	
VOC	1,2-Dibromo-3-chloropropane	96-12-8	2.4E+02	50.1		1.4E+02	1	111				6.0E-03	2.0E+01	50.1	92, 123	1.2E+03	50.1	92	5.8E-01	50.1	92	6.9E-01	40		6.9E-05	40		4.1E-03	1	115		62		1.0E+00	62	114									
VOC	Dibromochloromethane	124-48-1	2.1E+02	50.1		6.3E+01	44	111				3.2E-02	2.5E+01	44		2.6E+03	44		4.9E+00	50.1	92	1.7E-01	44		9.1E-05	44		2.9E-03	44	115		62		1.0E+00	62		5.9E+03	44	118	6.8E+02	44	118	4.2E+02	44	118
VOC	1,2-Dibromoethane	106-93-4	1.9E+02	50.1		2.2E+01	1	111				3.0E-02	2.0E+01	50.1	92, 123	4.2E+03	50.1	92	1.3E+01	50.1	92	3.7E-01	69		7.3E-05	69		1.6E-03	1	115		62		1.0E+00	62		8.3E+03	70		5.8E+02	70		4.0E+02	70	
VOC	Dibromomethane	74-95-3	1.7E+02	50.1		1.9E+01	39	111				3.5E-02	2.0E+01	50.1	92, 123	1.2E+04	50.1	92	4.4E+01	50.1	92	6.9E-01	40		6.9E-05	40		1.7E-03	39	115		62		1.0E+00	62	114	7.9E+03	70		5.8E+02	70		3.7E+02	70	
VOC	trans-1,4-Dichloro-2-butene	110-57-6	1.3E+02	1		5.9E+00	69	111				3.6E-03	2.5E+01	69		1.8E+03	69		9.7E-01	69		5.7E-01	69		8.0E-05	69		1.2E-03	69	115		62		1.0E+00	62	114									
VOC	1,2-Dichlorobenzene	95-50-1	1.5E+02	50.1		6.2E+02	44	111				7.8E-02	2.5E+01	44		1.6E+02	44		1.4E+00	50.1	92	6.0E-01	44		6.8E-05	44		4.4E-02	44	115		62		1.0E+00	62		9.7E+03	44	118	7.1E+02	44	118	4.5E+02	44	118
VOC	1,3-Dichlorobenzene	541-73-1	1.5E+02	50.1		5.7E+02	69	111				1.3E-01	2.0E+01	50.1	92, 123	1.3E+02	50.1	93	2.2E+00	50.1	92	6.0E-01	69		6.8E-05	69		4.1E-02	69	115		62		1.0E+00	62		9.2E+03	70		6.8E+02	70		4.5E+02	70	
VOC	1,4-Dichlorobenzene	106-46-7	1.5E+02	50.1		6.1E+02	44	111				1.0E-01	2.5E+01	44		7.4E+01	44		1.0E+00	50.1	92	6.0E-01	44		6.8E-05	44		4.3E-02	44	115		62		1.0E+00	62		9.3E+03	44	118	6.8E+02	44	118	4.5E+02	44	118
VOC	Dichlorodifluoromethane	75-71-8	1.2E+02	50.1		6.2E+01	1	111				1.4E+01	2.0E+01	50.1	92, 123	2.8E+02	50.1	92	4.8E+03	50.1	92	6.9E-01	40		6.9E-05	40		8.9E-03	1	115		62		1.0E+00	62		9.4E+03	70		3.8E+02	70		2.4E+02	70	
VOC	1,1-Dichloroethane	75-34-3	9.9E+01	50.1		3.1E+01	44	111				2.3E-01	2.5E+01	44		5.1E+03	44		2.3E+02	50.1	92	6.4E-01	44		9.1E-05	44		6.7E-03	44	115		62		1.0E+00	62		6.9E+03	44	118	5.2E+02	44	118	3.3E+02	44	118
VOC	1,2-Dichloroethane	107-06-2	9.9E+01	50.1		1.7E+01	44	111				4.0E-02	2.5E+01	44		8.5E+03	44		7.9E+01	50.1	92	9.0E-01	44		8.6E-05	44		4.1E-03	44	115		62		1.0E+00	62		7.6E+03	44	118	5.6E+02	44	118	3.6E+02	44	118
VOC	1,1-Dichloroethene	75-35-4	9.7E+01	50.1		5.8E+01	44	111				1.1E+00	2.5E+01	44		2.3E+03	44		6.0E+02	50.1	92	7.8E-01	44		9.0E-05	44		1.2E-02	44	115		62		1.0E+00	62		6.2E+03	44	118	5.8E+02	44	118	3.0E+02	44	118
VOC	trans-1,2-Dichloroethene	156-60-5	9.7E+01	50.1		5.2E+01	44	111				3.9E-01	2.5E+01	44		6.3E+03	44		3.3E+02	50.1	92	6.1E-01	44		1.0E-04	44		1.1E-02	44	115		62		1.0E+00	62	114	6.7E+03	44	118	5.2E+02	44	118	3.2E+02	44	118
VOC	1,2-Dichloropropane	78-87-5	1.1E+02	50.1		4.3E+01	44	111				1.2E-01	2.5E+01	44		2.8E+03	44		5.2E+01	50.1	92	6.8E-01	44		7.5E-05	44		7.4E-03	44	115		62		1.0E+00	62		7.6E+03	44	118	5.7E+02	44	118	3.7E+02	44	118
VOC	1,3-Dichloropropene (total)	542-75-6	1.1E+02	50.1		4.6E+01	44	111				7.3E-01	2.5E+01	44		2.8E+03	44		3.4E+01	50.1	92	5.4E-01	44		8.6E-05	44		7.9E-03	44	115		62		1.0E+00	62		7.9E+03	44	118	5.9E+02	44	118	3.8E+02	44	118
VOC	1,4-Dioxane	123-91-1	8.8E+01	50.1		5.6E-01	1	111				2.0E-04	2.0E+01	50.1	92, 123	1.0E+06	50.1	92	3.8E+01	50.1	92	2.0E+00	40		8.6E-05	40		2.7E-04	1	115		62		1.0E+00	62										
VOC	Ethyl Benzene	100-41-4	1.1E+02	50.1		3.7E+02	44	111				3.2E-01	2.5E+01	44		1.7E+02	44		9.6E+00	50.1	92	6.5E-01	44		6.7E-05	44		4.8E-02	44	115		62		1.0E+00	62		8.5E+03	44	118	6.2E+02	44	118	4.1E+02	44	118
VOC	Ethyl Methacrylate	97-63-2	1.1E+02	50.1		4.1E+01	39	111				3.4E-02	2.0E+01	50.1	92, 123	3.7E+03	50.1	92	2.1E+01	50.1	92	6.9E-01	40		6.9E-05	40		6.9E-03	39	115		62		1.0E+00	62	114	1.1E+04	70		5.7E+02	70		3.9E+02	70	
VOC	2-Hexanone	591-78-6	1.0E+02	50.1		1.5E+01	39	111				3.8E-03	2.5E+01	68		1.8E+04	39		1.2E+01	50.1	92	7.4E-01	52		7.6E-05	52		3.5E-03	39	115		62		1.0E+00	62	114									
VOC	Iodomethane	74-88-4	1.4E+02	1		2.6E+01	1	111				2.2E-01	2.5E+01	1		1.4E+04	1		4.0E+02	1		4.5E-01	69		6.7E-05	69		3.3E-03	1	115		62		1.0E+00	62										
VOC	Isobutyl Alcohol	78-83-1	7.4E+01	50.1		5.4E+00	1	111				4.8E-04	2.0E+01	50.1	92, 123	8.5E+04	50.1	92	1.0E+01	50.1	92	6.9E-01	40		6.9E-05	40		2.2E-03	1	115		62		1.0E+00	62	114	1.1E+04	70		5.5E+02	70		3.8E+02	70	
VOC	Methacrylonitrile	126-98-7	6.7E+01	50.1		3.2E+00	39	111				1.0E-02	2.0E+01	50.1	92, 123	2.5E+04	50.1	92	7.1E+01	50.1	92	6.9E-01	40		6.9E-05	40		1.5E-03	39	115		62		1.0E+00	62	114	7.6E+03	70		5.5E+02	70		3.6E+02	70	
VOC	4-Methyl-2-pentanone	108-10-1	1.0E+02	50.1		1.0E+01	62	111				5.6E-03	2.0E+01	50.1	92, 123	1.9E+04	39		2.0E+01	50.1	92	6.5E-01	40		6.7E-05	40		2.7E-03	62	115		62		1.0E+00	62		8.2E+03	70		5.7E+02	70		3.9E+02	70	
VOC	Methylene Chloride	75-09-2	8.5E+01	50.1		1.2E+01	44	111				9.0E-02	2.5E+01	44		1.3E+04	44		4.3E+02	50.1	92	8.7E-01	44		1.0E-04	44		3.5E-03	44	115		62		1.0E+00	62		6.7E+03	44	118	5.1E+02	44	118	3.1E+02	44	118
VOC	Methylmethacrylate	80-62-6	1.0E+02	50.1		1.4E+01	1	111				1.4E-02	2.0E+01	50.1	92, 123	1.5E+04	50.1	92	3.8E+01	50.1	92	6.7E-01	40		7.4E-05	40		3.3E-03	1	115		62		1.0E+00	62	114	9.0E+03	70		5.7E+02	70		3.7E+02	70	
VOC	Pentachloroethane	76-01-7	2.0E+02	50.1		1.7E+02	69	111				7.9E-02	2.0E+01	50.1	92, 123	4.8E+02	50.1	92	3.5E+00	50.1	92	5.7E-01	69		6.3E-05	69		7.3E-03	69	115		62		1.0E+00	62	114									
VOC	Propionitrile	107-12-0	5.5E+01	1		1.3E+00	1	111				2.4E-03	2.5E+01	39		1.0E+05	1		4.0E+01	1		1.1E+00	69		1.2E-04	69		8.3E-04	1	115		62		1.0E+00	62	114									
VOC	Styrene	100-42-5	1.0E+02	50.1		7.8E+02	44	82				1.1E-01	2.5E+01	44		3.1E+02	44		6.1E+00	50.1	92	6.1E-01	44		6.9E-05	44		3.6E-02	44	115		62		1.0E+00	62		8.7E+03	44	118	6.4E+02	44	118	4.2E+02	44	118
VOC	1,1,1,2-Tetrachloroethane	630-20-6	1.7E+02	50.1		3.1E+02	1	111				9.9E-02	2.0E+01	50.1	92, 123	1.1E+03	50.1	92	1.2E+01	50.1	92	6.1E-01	40		6.8E-05	40		1.8E-02	1	115		62		1.0E+00	62	114	9.8E+03	70		6.2E+02	70		4.0E+02	70	
VOC	1,1,2,2-Tetrachloroethane	79-34-5	1.7E+02	50.1		9.4E+01	44	111				1.4E-02	2.5E+01	44		3.0E+03	44		4.6E+00	50.1	92	6.1E-01	44		6.8E-05	44		6.9E-03	44	115		62		1.0E+00	62		9.0E+03	44	118	6.6E+02	44	118	4.2E+02	44	118
VOC	Tetrachloroethene	127-18-4	1.7E+02	50.1		1.6E+02	44	111				7.5E-01	2.5E+01	44		2.0E+02	44		1.9E+01	50.1	92	6.2E-01	44		7.1E-05	44		1.1E-02	44	115		62		1.0E+00	62		8.3E+03	44	118	6.2E+02	44	118	3.9E+02	44	118
VOC	Toluene	108-88-3	9.2E+01	50.1		1.8E+02	44	111				2.7E-01	2.5E+01	44		5.3E+02	44		2.8E+01	50.1	92	7.5E-01	44		7.4E-05	44		3.2E-02	44	115		62		1.0E+00	62		7.9E+03	44	118	5.9E+02	44	118	3.8E+02	44	118
VOC	1,2,4-Trichlorobenzene	120-82-1	1.8E+02	50.1		1.8E+03	44	111				5.8E-02	2.5E+01	44		3.0E+02	44		4.3E-01	50.1	92	2.6E-01	44		7.1E-05	44		6.8E-02	44	115		62		1.0E+00	62		1.0E+04	44	118	7.3E+02	44	118	4.9E+02	44	118
VOC	1,1,1-Trichloroethane	71-55-6	1.3E+02	50.1		1.1E+02	44	111				7.1E-01	2.5E+01	44		1.3E+03	44		1.2E+02	50.1	92	6.7E-01	44		7.6E-05	44		1.2E-02	44	115		62		1.0E+00	62		7.1E+03	44	118	5.5E+02	44	118	3.5E+02	44	118
VOC	1,1,2-Trichloroethane	79-00-5	1.3E+02	50.1		5.0E+01	44	111				3.7E-02	2.5E+01	44		4.4E+03	44		2.3E+01	50.1	92	6.7E-01	44		7.6E-05	44		6.4E-03	44	115		62		1.0E+00	62		8.3E+03	44	118	6.0E+02	44	118	3.9E+02	44	118
VOC	Trichloroethene	79-01-6	1.3E+02	50.1		1.7E+02	44	111				4.2E-01	2.5E+01	44		1.1E+03	44		7.3E+01	50.1	92	6.8E-01	44		7.9E-05	44		1.8E-02	44	115		62		1.0E+00	62		7.5E+03	44	118	5.4E+02	44	118	3.6E+02	44	118
VOC	Trichlorofluoromethane	75-69-4	1.4E+02	50.1		1.2E+02	69	111				4.0E+00	2.0E+01	50.1	92, 123	1.1E+03	50.1	92	8.0E+02	50.1	92	7.5E-01	69		8.4E-05	69		1.3E-02	69	115		62		1.0E+00	62		6.0E+03	70		4.7E+02	70		3.0E+02	70	
VOC	1,2,3-Trichloropropane	96-18-4	1.5E+02	50.1		4.4E+01	39	111				1.7E-02	2.0E+01	50.1	92, 123	1.8E+03	50.1	92	3.7E+00	50.1	92	6.1E-01	40		6.8E-05	40		4.8E-03	39	115		62		1.0E+00	62	114	9.2E+03	70		6.5E+02	70		4.3E+02	70	
VOC	Vinyl Acetate	108-05-4	8.6E+01	50.1		5.2E+00	44	82				2.1E-02	2.5E+01	44		2.0E+04	44		9.0E+01	50.1	92	7.3E-01	44		7.9E-05	44		1.6E-03	44	115		62		1.0E+00	62	114	7.8E+03	44	118	5.2E+02	44	118	3.5E+02	44	118
VOC	Vinyl Chloride	75-01-4	6.3E+01	50.1		1.8E+01	44	111				1.1E+00	2.5E+01	44		2.8E+03	44		3.0E+03	50.1	92	9.2E-01	44		1.1E-04	71		6.9E-03	44	115		62		1.0E+00	62		5.3E+03	44	118	4.3E+02	44	118	2.6E+02	44	118
VOC	Xylenes (total)	1330-20-7	1.1E+02	50.1		3.9E+02	44	111				2.8E-01	2.5E+01	44		1.7E+02	44		8.0E+00	50.1	92	6.7E-01	44		7.6E-05	44		5.0E-02	44	115		62		1.0E+00	62	114	8.6E+03	44	118	6.2E+02	44	118	4.1E+02	44	118
SVOC	Acenaphthene	83-32-9	1.5E+02	1		7.1E+03	44	82				6.4E-03	2.5E+01	44		4.2E+00	44		2.5E-03	50.1	92	3.6E-01	44		6.6E-05	44		8.4E-02	44	115	1.3E-01	62		1.0E+00	62	117	1.2E+04	44	118	8.0E+02	44	118	5.5E+02	44	118
SVOC	Acenaphthylene	208-96-8	1.5E+02	50.1		7.5E+03	69	82				4.6E-03	2.0E+01	50.1	92, 123	1.6E+01	50.1	92	9.1E-04	50.1	92	3.9E-01	69		6.0E-05	69		8.9E-02	69	115	1.3E-01	62		1.0E+00	62	114									
SVOC	Acetophenone	98-86-2	1.2E+02	50.1		3.6E+01	1	82				4.4E-04	2.0E+01	50.1	92, 123	6.1E+03	50.1	92	4.0E-01	50.1	92	6.9E-01	40		6.9E-05	40		3.7E-03	1	115	1.0E-01	62		1.0E+00	62	114	1.2E+04	70		7.1E+02	70		4.8E+02	70	
SVOC	2-Acetylaminofluorene	53-96-3	2.2E+02	1		1.7E+03	1	82				1.3E-04	2.5E+01	39		5.3E+00	39		5.6E-05	39		2.1E-01	69		5.2E-05	69		1.3E-02	1	115	1.0E-01	62		1.0E+00	62										
SVOC	4-Aminobiphenyl	92-67-1	1.7E+02	1		5.4E+02	1	82				1.6E-08	2.5E+01	1			1	66	6.0E-05	1	64	3.4E-01	69		6.0E-05	69		1.2E-02	1	115	1.0E-01	62		1.0E+00	62										
SVOC	Aniline	62-53-3	9.3E+01	50.1		7.7E+00	1	82				7.8E-05	2.0E+01	50.1	92, 123	3.6E+04	50.1	92	4.9E-01	50.1	92	6.0E-01	40		7.2E-05	40		1.9E-03	1	115	1.0E-01	62		1.0E+00	62										
SVOC	Anthracene	120-12-7	1.8E+02	50.1		3.0E+04	44	82				2.7E-03	2.5E+01	44		4.3E-02	44		2.7E-06	50.1	92	2.8E-01	44		6.7E-05	44		1.6E-01	44	115	1.3E-01	62		1.0E+00	62	117	1.3E+04	44	118	8.7E+02	44	118	6.2E+02	44	118
SVOC	Aramite (total)	140-57-8	3.3E+02	1		4.3E+06	69	82				7.8E-05	2.5E+01	69		1.4E+00	69		5.9E-06	69		1.6E-01	69		4.0E-05	69		6.0E-01	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Benzo(a)anthracene	56-55-3	2.3E+02	50.1		4.0E+05	44	82				1.4E-04	2.5E+01	44		9.4E-03	44		1.1E-07	50.1	92	4.4E-01	44		7.8E-05	44		4.8E-01	44	115	1.3E-01	62		9.0E-01	62	117	1.6E+04	44	118	1.0E+03	44	118	7.1E+02	44	118
SVOC	Benzo(a)pyrene	50-32-8	2.5E+02	50.1		1.0E+06	44	82				4.6E-05	2.5E+01	44		1.6E-03	44		5.5E-09	50.1	92	3.7E-01	44		7.8E-05	44		6.6E-01	44	115	1.3E-01	62		8.0E-01	62	117	1.9E+04	44	118	9.7E+02	44	118	7.2E+02	44	118
SVOC	Benzo(b)fluoranthene	205-99-2	2.5E+02	50.1		1.2E+06	44	82				4.6E-03	2.5E+01	44		1.5E-03	44		5.0E-07	50.1	92	2.0E-01	44		4.8E-05	44		7.6E-01	44	115	1.3E-01	62		8.0E-01	62	117	1.7E+04	44	118	9.7E+02	44	118	7.2E+02	44	118
SVOC	Benzo(g,h,i)perylene	191-24-2	2.8E+02	50.1		1.3E+07	69	82				5.8E-06	2.0E+01	50.1	92, 123	2.6E-04	50.1	92	1.0E-10	50.1	92	1.9E-01	69		4.5E-05	69		2.7E+00	69	115	1.3E-01	62		7.0E-01	62	117									
SVOC	Benzo(k)fluoranthene	207-08-9	2.5E+02	50.1		1.2E+06	44	82				3.4E-05	2.5E+01	44		8.0E-04	44		2.0E-09	50.1	92	2.0E-01	44		4.8E-05	44		7.6E-01	44	115	1.3E-01	62		8.0E-01	62	117	1.8E+04	44	118	1.0E+03	44	118	7.5E+02	44	118
SVOC	Benzyl Alcohol	100-51-6	1.1E+02	50.1		1.2E+01	69	82				1.6E-05	2.5E+01	40		4.0E+04	50.1	92	6.3E-02	50.1	92	6.1E-01	69		7.8E-05	69		2.1E-03	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	bis(2-Chloroethoxy)methane	111-91-1	1.7E+02	50.1		1.7E+01	69	82				6.9E-06	2.0E+01	50.1	92, 123	1.2E+05	50.1	92	1.4E-04	50.1	92	3.8E-01	69		7.3E-05	69		1.2E-03	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	bis(2-Chloroethyl) ether	111-44-4	1.4E+02	50.1		1.5E+01	44	82				7.4E-04	2.5E+01	44		1.7E+04	44		1.6E+00	50.1	92	6.0E-01	44		6.5E-05	44		1.6E-03	44	115	1.0E-01	62		1.0E+00	62		1.1E+04	44	118	6.6E+02	44	118	4.5E+02	44	118
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	3.9E+02	50.1		1.5E+07	44	82				4.2E-06	2.5E+01	44		3.4E-01	44		6.5E-06	50.1	94	3.0E-01	44		3.2E-05	44		6.8E-01	44	115	1.0E-01	62		4.0E-01	62	117	1.6E+04	44	118	8.1E+02	44	118	6.6E+02	44	118
SVOC	4-Bromophenyl-phenyl ether	101-55-3	2.5E+02	50.1		1.6E+04	1	82				4.8E-03	2.0E+01	50.1	92, 123	4.6E+00	50.1	92	1.5E-03	50.1	92	2.3E-01	69		5.9E-05	69		4.3E-02	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	2-sec-Butyl-4,6-dinitrophenol	88-85-7	2.4E+02	50.1		4.2E+03	1	82				1.9E-05	2.0E+01	50.1	92, 123	5.2E+01	50.1	92	7.5E-05	50.1	92	6.9E-01	40		6.9E-05	40		2.0E-02	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Butylbenzylphthalate	85-68-7	3.1E+02	50.1		5.7E+04	44	82				5.2E-05	2.5E+01	44		2.7E+00	44		8.3E-06	50.1	92	1.5E-01	44		4.2E-05	44		4.4E-02	44	115	1.0E-01	62		9.0E-01	62	117	1.4E+04	44	118	8.4E+02	44	118	6.6E+02	44	118
SVOC	4-Chloro-3-methylphenol	59-50-7	1.4E+02	50.1		1.1E+03	1	82				1.6E-05	2.0E+01	50.1	91, 123	3.8E+03	50.1	94	8.2E-03	50.1	91	5.2E-01	69		8.2E-05	69		2.8E-02	1	115	1.0E-01	62		1.0E+00	62										
SVOC	4-Chloroaniline	106-47-8	1.3E+02	50.1		6.6E+01	44					1.4E-05	2.5E+01	44		5.3E+03	44		1.2E-02	50.1	92	4.2E-01	44		8.7E-05	44		5.1E-03	44	115	1.0E-01	62		1.0E+00	62	114	1.2E+04	44	118	7.5E+02	44	118	5.0E+02	44	118
SVOC	p-Chlorobenzilate	510-15-6	3.3E+02	50.1		1.9E+04	39	82				3.0E-06	2.0E+01	39	123	1.1E+01	50.1	90	2.0E-06	50.1	90	6.9E-01	40		6.9E-05	40		1.8E-02	39	115	1.0E-01	62		1.0E+00	62	114									
SVOC	2-Chloronaphthalene	91-58-7	1.6E+02	50.1		1.1E+04	1	82				1.3E-02	2.0E+01	50.1	92, 123	1.2E+01	50.1	92	8.0E-03	50.1	92	4.3E-01	69		7.6E-05	69		1.0E-01	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	2-Chlorophenol	95-57-8	1.3E+02	50.1		3.9E+02	44	43				1.6E-02	2.5E+01	44		2.2E+04	44		2.3E+00	50.1	92	4.3E-01	44		8.2E-05	44		7.9E-03	44	115	1.0E-01	62		1.0E+00	62		9.6E+03	44	118	6.8E+02	44	118	4.5E+02	44	118

Attachment A1: Physical and Chemical Properties
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	Molecular Weight, MW (g/mole)			Organic Carbon Partition Coefficient, K_{oc} (L/kg)			Partition Coefficient for Soil, K_d (L/kg)			Henry's Law Constant and Reference Temperature H (unitless) and Temp (°C)				Solubility, s (mg/L)			Vapor Pressure, VP (mm Hg)			Diffusivity in Air, D_{air} (m^2/d)			Diffusivity in Water, D_{water} (m^2/d)			Dermal Permeability Coefficient, K_p (cm/hr)			Dermal Absorption Fraction, ABS_d (unitless)			Fraction Absorbed, FA (unitless)			Enthalpy of Vaporization at Normal Boiling Point, $\Delta H_{v,b}$ (cal/mol)			Critical Temperature, T_C (Kelvin)			Normal Boiling Point, T_B (Kelvin)		
			Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Temp	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes
SVOC	4-Chlorophenyl-phenyl ether	7005-72-3	2.0E+02	50.1		1.0E+04	1	82				9.0E-03	2.0E+01	1	55, 123	1.4E+00	50.1	90	2.7E-03	1		2.5E-01	69		6.6E-05	69		5.6E-02	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Chrysene	218-01-9	2.3E+02	50.1		4.0E+05	44	82				3.9E-03	2.5E+01	44		1.6E-03	44		6.2E-09	50.1	92	2.1E-01	44		5.4E-05	44		4.8E-01	44	115	1.3E-01	62		9.0E-01	62	117	1.6E+04	44	118	9.8E+02	44	118	7.1E+02	44	118
SVOC	Diallate (total)	2303-16-4	2.7E+02	50.1		6.0E+07	69	82				1.6E-04	2.5E+01	40		4.0E+01	50.1	90	5.4E-03	50.1	90	1.8E-01	69		4.6E-05	69		8.1E+00	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Dibenz(a,h)anthracene	53-70-3	2.8E+02	50.1		3.8E+06	44	82				6.0E-07	2.5E+01	44		2.5E-03	44		1.0E-10	50.1	92	1.7E-01	44		4.5E-05	44		1.1E+00	44	115	1.3E-01	62		7.0E-01	62	117	3.0E+04	44	118	9.9E+02	44	118	7.4E+02	44	118
SVOC	Dibenzofuran	132-64-9	1.7E+02	50.1		2.1E+04	69	82				5.1E-04	2.0E+01	50.1	92, 123	1.0E+01	50.1	93	1.8E-04	50.1	92	2.1E-01	69		5.2E-05	69		1.4E-01	69	115	1.0E-01	62		1.0E+00	62	117	6.6E+04	70		8.2E+02	70		5.6E+02	70	
SVOC	3,3'-Dichlorobenzidine	91-94-1	2.5E+02	50.1		7.2E+02	44	111				1.6E-07	2.5E+01	44		3.1E+00	44		3.7E-08	50.1	92	1.7E-01	44		5.8E-05	44		1.3E-02	44	115	1.0E-01	62		1.0E+00	62		2.0E+04	44	118	7.5E+02	44	118	5.6E+02	44	118
SVOC	2,4-Dichlorophenol	120-83-2	1.6E+02	50.1		1.5E+02	44	43				1.3E-04	2.5E+01	44		4.5E+03	44		6.7E-02	50.1	92	3.0E-01	44		7.6E-05	44		2.1E-02	44	115	1.0E-01	62		1.0E+00	62		1.5E+04	44	118	7.1E+02	44	118	4.8E+02	44	118
SVOC	2,6-Dichlorophenol	87-65-0	1.6E+02	1		6.8E+02	1	82				1.6E-03	2.0E+01	1	55, 123	1.9E+03	68		1.0E+00	1		4.2E-01	69		7.6E-05	69		1.5E-02	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Diethylphthalate	84-66-2	2.2E+02	50.1		2.9E+02	44	82				1.9E-05	2.5E+01	44		1.1E+03	44		1.7E-03	50.1	92	2.2E-01	44		5.5E-05	44		4.0E-03	44	115	1.0E-01	62		1.0E+00	62		1.4E+04	44	118	7.6E+02	44	118	5.7E+02	44	118
SVOC	Dimethoate	60-51-5	2.3E+02	50.1		4.6E+02	1	82				2.5E-09	2.0E+01	50.1	92, 123	2.5E+04	50.1	92	5.1E-06	50.1	92	6.9E-01	40		6.9E-05	40		5.1E-03	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	p-(Dimethylamino)azobenzene	60-11-7	2.3E+02	1		3.2E+04	1	82				1.6E-08	2.5E+01	39		2.3E-01	39		7.0E-08	39		2.2E-01	69		5.5E-05	69		9.1E-02	1	115	1.0E-01	62		1.0E+00	62										
SVOC	7,12-Dimethylbenz(a)anthracene	57-97-6	2.6E+02	50.1		5.0E+05	39	82				1.3E-06	2.0E+01	50.1	92, 123	2.5E-02	50.1	93	5.6E-09	50.1	92	6.9E-01	40		6.9E-05	40		3.9E-01	39	115	1.0E-01	62		1.0E+00	62	114									
SVOC	3,3'-Dimethylbenzidine	119-93-7	2.1E+02	50.1		2.0E+02	39	82				2.6E-09	2.0E+01	50.1	92, 123	1.3E+03	50.1	92	8.5E-08	50.1	92	6.9E-01	40		6.9E-05	40		3.6E-03	39	115	1.0E-01	62		1.0E+00	62										
SVOC	a,a-Dimethylphenethylamine	122-09-8	1.5E+02	1		7.4E+01	68	82				5.8E-05	2.5E+01	68		1.9E+04	68		9.6E-02	68								4.2E-03	68	115	1.0E-01	62		1.0E+00	62	114									
SVOC	2,4-Dimethylphenol	105-67-9	1.2E+02	50.1		2.1E+02	44					8.2E-05	2.5E+01	44		7.9E+03	44		9.8E-02	50.1	92	5.0E-01	44		7.5E-05	44		1.2E-02	44	115	1.0E-01	62		1.0E+00	62		1.1E+04	44	118	7.1E+02	44	118	4.8E+02	44	118
SVOC	Dimethylphthalate	131-11-3	1.9E+02	50.1		6.9E+01	69	82				4.3E-06	2.0E+01	50.1	92, 123	4.0E+03	50.1	92	1.7E-03	50.1	92	4.9E-01	69		5.4E-05	69		2.2E-03	69	115	1.0E-01	62		1.0E+00	62										
SVOC	Di-n-butylphthalate	84-74-2	2.8E+02	50.1		3.4E+04	44	82				3.9E-08	2.5E+01	44		1.1E+01	44		7.3E-05	50.1	92	3.8E-01	44		6.8E-05	44		4.8E-02	44	115	1.0E-01	62		9.0E-01	62		1.5E+04	44	118	8.0E+02	44	118	6.1E+02	44	118
SVOC	4,6-Dinitro-2-methylphenol	534-52-1	2.0E+02	50.1		1.2E+02	69	82				1.7E-05	2.0E+01	50.1	92, 123	2.0E+02	50.1	92	3.2E-04	50.1	92	2.4E-01	69		6.0E-05	69		3.1E-03	69	115	1.0E-01	62		1.0E+00	62										
SVOC	1,3-Dinitrobenzene	99-65-0	1.7E+02	50.1		2.9E+01	1	82				9.4E-06	2.0E+01	50.1	92, 123	8.6E+02	50.1	92	9.0E-04	50.1	92	2.4E+00	40		6.6E-05	40		1.7E-03	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	2,4-Dinitrophenol	51-28-5	1.8E+02	50.1		1.0E-02	44	43				1.8E-05	2.5E+01	44		2.8E+03	44		5.1E-03	50.1	92	2.4E-01	44		7.8E-05	44		1.6E-03	44	115	1.0E-01	62		1.0E+00	62		2.5E+04	44	118	8.3E+02	44	118	6.1E+02	44	118
SVOC	2,4-Dinitrotoluene	121-14-2	1.8E+02	50.1		9.5E+01	44	82				3.8E-06	2.5E+01	44		2.7E+02	44		1.5E-04	50.1	92	1.8E+00	44		6.1E-05	44		3.2E-03	44	115	1.0E-01	62		1.0E+00	62		1.3E+04	44	118	8.1E+02	44	118	5.9E+02	44	118
SVOC	2,6-Dinitrotoluene	606-20-2	1.8E+02	50.1		6.9E+01	44	82				3.1E-05	2.5E+01	44		1.8E+02	44		5.7E-04	50.1	92	2.8E-01	44		6.3E-05	44		2.6E-03	44	115	1.0E-01	62		1.0E+00	62		1.3E+04	44	118	7.7E+02	44	118	5.6E+02	44	118
SVOC	Di-n-octylphthalate	117-84-0	3.9E+02	50.1		8.4E+07	44	82				2.7E-03	2.5E+01	44		2.0E-02	44		2.6E-06	50.1	92	1.3E-01	44		3.1E-05	44		2.2E+00	44	115	1.0E-01	62		3.0E-01	62	117	1.4E+04	44	118	8.6E+02	44	118	7.0E+02	44	118
SVOC	Diphenylamine	122-39-4	1.7E+02	50.1		1.5E+03	1	82				2.0E-05	2.0E+01	50.1	92, 123	3.6E+01	50.1	92	6.7E-04	50.1	92	5.9E-01	40		5.4E-05	40		2.4E-02	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Disulfoton	298-04-4	2.7E+02	50.1		7.5E+03	1	82				1.6E-04	2.0E+01	50.1	92, 123	1.6E+01	50.1	92	1.8E-04	50.1	92	6.9E-01	40		6.9E-05	40		1.8E-02	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Ethylmethanesulfonate	62-50-0	1.2E+02	50.1		1.1E+00	39	82				2.2E-04	2.0E+01	50.1	92, 123	6.3E+03	50.1	92	2.1E-01	50.1	92	6.9E-01	40		6.9E-05	40		3.5E-04	39	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Famphur	52-85-7	3.3E+02	1		1.6E+02	39	82				6.5E-07	2.5E+01	69		1.1E+02	69		1.4E-06	69		1.7E-01	69		4.1E-05	69		7.1E-04	39	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Fluoranthene	206-44-0	2.0E+02	50.1		1.1E+05	44	82				6.6E-04	2.5E+01	44		2.1E-01	44		7.8E-06	50.1	94	2.6E-01	44		5.5E-05	44		2.8E-01	44	115	1.3E-01	62		1.0E+00	62	117	1.4E+04	44	118	9.1E+02	44	118	6.6E+02	44	118
SVOC	Fluorene	86-73-7	1.7E+02	50.1		1.4E+04	44	82				2.6E-03	2.5E+01	44		2.0E+00	44		6.3E-04	50.1	92	3.1E-01	44		6.8E-05	44		1.1E-01	44	115	1.3E-01	62		1.0E+00	62	117	1.3E+04	44	118	8.7E+02	44	118	5.7E+02	44	118
SVOC	Hexachlorobenzene	118-74-1	2.8E+02	50.1		5.5E+04	44	111				5.4E-02	2.5E+01	44		6.2E+00	44		1.8E-05	50.1	92	4.7E-01	44		5.1E-05	44		3.1E-01	44	115	1.0E-01	62		8.0E-01	62	117	1.4E+04	44	118	8.3E+02	44	118	5.8E+02	44	118
SVOC	Hexachlorobutadiene	87-68-3	2.6E+02	50.1		5.4E+04	44	82				3.3E-01	2.5E+01	44		3.2E+00	44		2.2E-01	50.1	92	4.8E-01	44		5.3E-05	44		8.2E-02	44	115	1.0E-01	62		9.0E-01	62		1.0E+04	44	118	7.4E+02	44	118	4.9E+02	44	118
SVOC	Hexachlorocyclopentadiene	77-47-4	2.7E+02	50.1		2.0E+05	44	82				1.1E+00	2.5E+01	44		1.8E+00	44		6.0E-02	50.1	94	1.4E-01	44		6.2E-05	44		1.7E-01	44	115	1.0E-01	62		9.0E-01	62	117	1.1E+04	44	118	7.5E+02	44	118	5.1E+02	44	118
SVOC	Hexachloroethane	67-72-1	2.4E+02	50.1		1.8E+03	44	111				1.6E-01	2.5E+01	44		5.0E+01	44		2.1E-01	50.1	92	2.2E-02	44		5.9E-05	44		3.3E-02	44	115	1.0E-01	62		1.0E+00	62		9.5E+03	44	118	7.0E+02	44	118	4.6E+02	44	118
SVOC	Hexachloropropene	1888-71-7	2.5E+02	1		2.0E+04	68	82				1.9E-01	2.5E+01	68		1.7E+01	68		2.4E-01	68								5.0E-02	68	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	2.8E+02	50.1		3.4E+06	44	82				6.6E-05	2.5E+01	44		2.2E-05	44		1.0E-10	50.1	92	1.6E-01	44		4.9E-05	44		1.1E+00	44	115	1.3E-01	62		7.0E-01	62	117	1.9E+04	44	118	1.1E+03	44	118	8.1E+02	44	118
SVOC	Isophorone	78-59-1	1.4E+02	50.1		4.7E+01	44	82				2.7E-04	2.5E+01	44		1.2E+04	44		4.4E-01	50.1	92	5.4E-01	44		5.8E-05	44		3.5E-03	44	115	1.0E-01	62		1.0E+00	62		1.0E+04	44	118	7.2E+02	44	118	4.9E+02	44	118
SVOC	Isosafrole (total)	120-58-1	1.6E+02	1		4.1E+02	1	82				1.3E-10	2.0E+01	1	55, 123	1.1E+03	1	55	1.6E-08	1	55	3.8E-01	69		6.6E-05	69		1.1E-02	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Methapyrilene	91-80-5	2.6E+02	1		4.9E+02	1	82				1.1E-05	2.0E+01	39	123	8.8E+02	39		7.0E-04	39		2.0E-01	69		5.1E-05	69		3.5E-03	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	3-Methylcholanthrene	56-49-5	2.7E+02	50.1		9.8E+06	1	82				3.8E-05	2.0E+01	50.1	92, 123	3.2E-03	50.1	93	7.7E-09	50.1	92	6.9E-01	40		6.9E-05	40		2.5E+00	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Methylmethanesulfonate	66-27-3	1.1E+02	1		1.2E-01	69	82				2.9E-08	2.5E+01	69		2.0E+05	1	55	5.2E-01	69		6.7E-01	69		8.9E-05	69		9.0E-05	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	2-Methylnaphthalene	91-57-6	1.4E+02	50.1		6.2E+03	39	82				2.1E-02	2.0E+01	50.1	92, 123	2.5E+01	50.1	92	5.5E-02	50.1	92	4.5E-01	69		6.7E-05	69		8.9E-02	39	115	1.0E-01	62		1.0E+00	62	117	1.3E+04	70		7.6E+02	70		5.1E+02	70	
SVOC	Methylphenol (total)	1319-77-3	1.1E+02	50.1	130	7.7E+01	1	82, 130				3.2E-05	2.0E+01	50.1	92, 123, 130	2.2E+04	50.1	92, 130	1.1E-01	50.1	92, 130	6.4E-01	40	130	8.6E-05	40	130	7.3E-03	1	115, 130	1.0E-01	62		1.0E+00	62	114									
SVOC	Naphthalene	91-20-3	1.3E+02	50.1		2.0E+03	44	82				2.0E-02	2.5E+01	44		3.1E+01	44		8.5E-02	50.1	92	5.1E-01	44		6.5E-05	44		5.0E-02	44	115	1.3E-01	62		1.0E+00	62		1.0E+04	44	118	7.5E+02	44	118	4.9E+02	44	118
SVOC	1,4-Naphthoquinone	130-15-4	1.6E+02	1		6.0E+02	69	82				9.4E-04	2.5E+01	69		6.7E+02	69		1.8E-04	68		4.5E-01	69		7.8E-05	69		1.5E-02	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	1-Naphthylamine	134-32-7	1.4E+02	1		1.5E+02	1	82				5.2E-09	2.5E+01	1		1.7E+03	1	55	1.0E+00	1		4.8E-01	69		7.2E-05	69		7.3E-03	1	115	1.0E-01	62		1.0E+00	62										
SVOC	2-Naphthylamine	91-59-8	1.4E+02	50.1		1.6E+02	1	82				2.5E-05	2.0E+01	50.1	92, 123	2.6E+02	50.1	92	8.4E-04	50.1	92	6.9E-01	40		6.9E-05	40		7.6E-03	1	115	1.0E-01	62		1.0E+00	62										
SVOC	2-Nitroaniline	88-74-4	1.4E+02	50.1		6.6E+01	69	82				6.5E-06	2.5E+01	69		2.9E+02	50.1	90	1.4E-04	50.1	90	6.3E-01	69		6.9E-05	69		4.4E-03	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	3-Nitroaniline	99-09-2	1.4E+02	50.1		2.2E+01	1	82				5.9E-06	2.0E+01	50.1	92, 123	1.2E+03	50.1	92	9.6E-05	50.1	92	5.7E-01	69		7.2E-05	69		2.1E-03	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	4-Nitroaniline	100-01-6	1.4E+02	50.1		2.3E+01	1	82				8.5E-08	2.0E+01	50.1	92, 123	7.3E+02	50.1	92	8.3E-06	50.1	92	5.0E-01	69		7.4E-05	69		2.2E-03	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Nitrobenzene	98-95-3	1.2E+02	50.1		6.4E+01	44	82				9.8E-04	2.5E+01	44		2.1E+03	44		2.5E-01	50.1	92	6.6E-01	44		7.4E-05	44		5.3E-03	44	115	1.0E-01	62		1.0E+00	62	114	1.1E+04	44	118	7.2E+02	44	118	4.8E+02	44	118
SVOC	2-Nitrophenol	88-75-5	1.4E+02	50.1		5.8E+01	1	82				3.9E-04	2.0E+01	50.1	92, 123	2.2E+03	50.1	92	1.1E-01	50.1	92	4.7E-01	69		6.8E-05	69		4.0E-03	1	115	1.0E-01	62		1.0E+00	62										
SVOC	4-Nitrophenol	100-02-7	1.4E+02	50.1		7.5E+01	69	82				1.7E-08	2.0E+01	50.1	92, 123	1.2E+04	50.1	92	4.1E-05	50.1	92	5.4E-01	69		8.3E-05	69		4.8E-03	69	115	1.0E-01	62		1.0E+00	62										
SVOC	4-Nitroquinoline-1-oxide	56-57-5	1.9E+02	1		1.2E+01	68	82				1.1E-12	2.5E+01	68		2.3E+03	68		2.6E-06	68								7.2E-04	68	115	1.0E-01	62		1.0E+00	62	114									
SVOC	N-Nitrosodi-n-butylamine	924-16-3	1.6E+02	50.1		7.7E+01	39	82				1.3E-02	2.0E+01	50.1	92, 123	1.3E+03	50.1	92	3.0E-02	50.1	92	6.9E-01	40		6.9E-05	40		3.8E-03	39	115	1.0E-01	62		1.0E+00	62										
SVOC	N-Nitrosodiethylamine	55-18-5	1.0E+02	50.1		3.0E+00	39	82				1.5E-04	2.0E+01	50.1	92, 123	9.3E+04	50.1	92	8.6E-01	50.1	92	6.9E-01	40		6.9E-05	40		8.8E-04	39	115	1.0E-01	62		1.0E+00	62										
SVOC	N-Nitrosodimethylamine	62-75-9	7.4E+01	50.1		3.5E-01	1	82				4.9E-05	2.0E+01	50.1	92, 123	1.0E+06	50.1	92	2.7E+00	50.1	92	6.9E-01	40		6.9E-05	40		3.0E-04	1	115	1.0E-01	62		1.0E+00	62										
SVOC	N-Nitrosodiphenylamine	86-30-6	2.0E+02	50.1		1.3E+03	44					2.1E-04	2.5E+01	44		3.5E+01	44		6.7E-04	50.1	92	2.7E-01	44		5.5E-05	44		1.5E-02	44	115	1.0E-01	62		1.0E+00	62		7.3E+03	44	118	8.9E+02	44	118	6.3E+02	44	118
SVOC	N-Nitroso-di-n-propylamine	621-64-7	1.3E+02	50.1		2.4E+01	44					9.2E-05	2.5E+01	44		9.9E+03	44		1.3E-01	50.1	92	4.7E-01	44		7.1E-05	44		2.5E-03	44	115	1.0E-01	62		1.0E+00	62		6.1E+03	44	118	7.5E+02	44	118	5.1E+02	44	118
SVOC	N-Nitrosomethylethylamine	10595-95-6	8.8E+01	50.1		1.1E+00	68	82				3.6E-05	2.5E+01	40		2.0E+04	50.1	90	2.3E+00	40		6.9E-01	40		6.9E-05	40		5.4E-04	68	115	1.0E-01	62		1.0E+00	62	114									
SVOC	N-Nitrosopiperidine	100-75-4	1.1E+02	50.1		2.3E+00	39	82				1.1E-05	2.0E+01	50.1	92, 123	7.6E+04	50.1	92	1.4E-01	50.1	92	6.9E-01	40		6.9E-05	40		6.3E-04	39	115	1.0E-01	62		1.0E+00	62										
SVOC	N-Nitrosopyrrolidine	930-55-2	1.0E+02	50.1		6.5E-01	39	82				4.9E-07	2.0E+01	50.1	92, 123	1.0E+06	50.1	92	9.2E-02	50.1	92	6.9E-01	40		6.9E-05	40		3.3E-04	39	115	1.0E-01	62		1.0E+00	62	114									
SVOC	5-Nitro-o-toluidine	99-55-8	1.5E+02	46		8.4E+01	39	82				7.2E-07	2.5E+01	39		7.5E+02	39		6.5E-05	39		4.3E-01	69		7.0E-05	69		4.3E-03	39	115	1.0E-01	62		1.0E+00	62	114									
SVOC	N-Nitrosomorpholine	59-89-2	1.2E+02	1		3.7E-01	39	82				1.7E-06	2.0E+01	39		8.6E+05	39		3.6E-02	39		5.1E-01	69		8.6E-05	69		1.8E-04	39	115	1.0E-01	62		1.0E+00	62										
SVOC	2,2'-oxybis(1-Chloropropane)	108-60-1	1.7E+02	50.1		2.6E+02	69	82				4.8E-03	2.0E+01	50.1	92, 123	1.7E+03	50.1	92	8.8E-01	50.1	92	5.2E-01	69		5.5E-05	69		7.2E-03	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Pentachlorobenzene	608-93-5	2.5E+02	50.1		1.5E+04	1	111				2.9E-02	2.0E+01	50.1	92, 123	1.3E+00	50.1	93	2.2E-03	50.1	92	5.8E-01	40		5.4E-05	40		1.6E-01	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Pentachloronitrobenzene	82-68-8	3.0E+02	50.1		5.7E+03	39	111				1.6E-02	2.0E+01	50.1	92, 123	5.5E-01	50.1	92	1.1E-04	50.1	92	6.9E-01	40		6.9E-05	40		4.1E-02	39	115	1.0E-01	62		9.0E-01	62										
SVOC	Pentachlorophenol	87-86-5	2.7E+02	50.1		5.9E+02	44	43				1.0E-06	2.5E+01	44		2.0E+03	44		3.2E-05	50.1	92	4.8E-01	44		5.3E-05	44		1.2E-01	44	115	2.5E-01	62		9.0E-01	62		1.6E+04	44	118	8.1E+02	44	118	5.8E+02	44	118
SVOC	Phenacetin	62-44-2	1.8E+02	1		3.6E+01	1	82				8.7E-09	2.5E+01	39		7.6E+02	1	55	6.9E-07	39		4.9E-01	69		5.9E-05	69		1.7E-03	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Phenanthrene	85-01-8	1.8E+02	50.1		2.4E+04	69	82				9.5E-04	2.0E+01	50.1	92, 123	1.2E+00	50.1	92	1.1E-04	50.1	92	3.2E-01	69		6.5E-05	69		1.4E-01	69	115	1.3E-01	62		1.0E+00	62	117									
SVOC	Phenol	108-95-2	9.4E+01	50.1		2.9E+01	44					1.6E-05	2.5E+01	44		8.3E+04	44		2.8E-01	50.1	92	7.1E-01	44		7.9E-05	44		4.5E-03	44	115	1.0E-01	62		1.0E+00	62		1.1E+04	44	118	6.9E+02	44	118	4.6E+02	44	118
SVOC	p-Phenylene diamine	106-50-3	1.1E+02	1		5.6E-01	1	82				3.2E-08	2.5E+01	39		3.7E+04	39		7.3E-04	39		6.6E-01	69		8.6E-05	69		2.6E-04	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Phorate	298-02-2	2.6E+02	50.1		3.2E+03	69	82				1.8E-05	2.5E+01	69		5.0E+01	50.1	92	8.4E-04	50.1	92	1.9E-01	69		4.7E-05	69		1.2E-02	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	2-Picoline	109-06-8	9.3E+01	1		1.1E+01	69	82				4.0E-04	2.5E+01	69		1.0E+06	69		1.1E+01	69		6.9E-01	69		8.3E-05	69		2.4E-03	69	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Pronamide	23950-58-5	2.6E+02	50.1		2.4E+03	1	82				2.2E-04	2.0E+01	50.1	91, 123	3.3E+01	50.1	93	5.8E-03	50.1	91	6.9E-01	40		6.9E-05	40		1.1E-02	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Pyrene	129-00-0	2.0E+02	50.1		1.1E+05	44	82				4.5E-04	2.5E+01	44		1.4E-01	44		4.6E-06	50.1	92	2.4E-01	44		6.3E-05	44		2.8E-01	44	115	1.3E-01	62		1.0E+00	62	117	1.4E+04	44	118	9.4E+02	44	118	6.7E+02	44	118
SVOC	Pyridine	110-86-1	7.9E+01	50.1		4.4E+00	1	82				3.6E-04	2.0E+01	50.1	92, 123	1.0E+06	50.1	92	2.1E+01	50.1	92	7.9E-01	40		6.6E-05	40		1.5E-03	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Safrole (total)	94-59-7	1.6E+02	50.1		4.1E+02	39	82				7.6E-04	2.0E+01	50.1	92, 123	8.1E+02	50.1	92	7.1E-02	50.1	92	6.9E-01	40		6.9E-05	40		1.1E-02	39	115	1.0E-01	62		1.0E+00	62										
SVOC	Sulfotepp	3689-24-5	3.2E+02	50.1		5.8E+03	1	82				1.2E-04	2.0E+01	1		2.5E+01	50.1	90	1.7E-04	50.1	94	6.9E-01	40		6.9E-05	40		8.4E-03	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	1,2,4,5-Tetrachlorobenzene	95-94-3	2.2E+02	50.1		4.5E+03	1	111				1.1E-01	2.0E+01	50.1	92, 123	6.0E-01	50.1	92	5.4E-03	50.1	92	6.9E-01	40		6.9E-05	40		9.3E-02	1	115	1.0E-01	62		1.0E+00	62	114									
SVOC	2,3,4,6-Tetrachlorophenol	58-90-2	2.3E+02	50.1		2.8E+02	44					1.8E-04	2.0E+01	50.1	92, 123	1.0E+02	50.1	92	1.4E-03	50.1	92	6.9E-01	40		6.9E-05	40		6.9E-02	39	115	1.0E-01	62		1.0E+00	62	114									
SVOC	Thionazin	297-97-2	2.5E+02	1		6.7E+01	68	82				3.5E-05	2.5E+01	68			1	66	3.0E-03	1								1.1E-03	68	115	1.0E-01	62		1.0E+00	62	114									
SVOC	o-Toluidine	95-53-4	1.1E+02	50.1		1.9E+01	1	53, 82				1.1E-04	2.0E+01	50.1	92, 123	1.7E+04	50.1	92	3.2E-01	50.1	92	6.9E-01	40		6.9E-05	40		2.8E-03	1	53, 115	1.0E-01	62		1.0E+00	62										
SVOC	2,4,5-Trichlorophenol	95-95-4	2.0E+02	50.1		1.6E+03	44	43				1.8E-04	2.5E+01	44		1.2E+03	44		2.0E-02	50.1	92	2.5E-01	44		6.1E-05	44		4.7E-02	44	115	1.0E-01	62		1.0E+00	62	114	1.1E+04	44	118	7.6E+02	44	118	5.3E+02	44	118

Attachment A1: Physical and Chemical Properties
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	Molecular Weight, **MW** (g/mole)			Organic Carbon Partition Coefficient, K_{oc} (L/kg)			Partition Coefficient for Soil, K_d (L/kg)			Henry's Law Constant and Reference Temperature **H** (unitless) and **Temp** (°C)				Solubility, **s** (mg/L)			Vapor Pressure, **VP** (mm Hg)		
			Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Temp	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes
SVOC	2,4,6-Trichlorophenol	88-06-2	2.0E+02	50.1		3.8E+02	44	43				3.2E-04	2.5E+01	44		8.0E+02	44		2.4E-02	50.1	92
SVOC	O,O,O-Triethyl phosphorothioate	126-68-1	2.0E+02	1																	
SVOC	1,3,5-Trinitrobenzene	99-35-4	2.1E+02	50.1		1.4E+01	69	82				6.5E-07	2.0E+01	50.1	91, 123	3.5E+02	50.1	94	2.0E-05	50.1	90
INORG	Aluminum	7429-90-5	2.7E+01	50.1					1.5E+03	35											
INORG	Antimony	7440-36-0	1.2E+02	50.1					4.5E+01	44	43						1	61			
INORG	Arsenic	7440-38-2	7.5E+01	50.1					2.9E+01	44	43						1	61			
INORG	Barium	7440-39-3	1.4E+02	50.1					4.1E+01	44	43						1	60			
INORG	Beryllium	7440-41-7	9.0E+00	50.1					7.9E+02	44	43						1	61			
INORG	Cadmium	7440-43-9	1.1E+02	50.1					7.5E+01	44	43						1	61			
INORG	Chromium (total)	7440-47-3	5.2E+01	50.1					1.9E+01	44	43, 45						1	61			
INORG	Chromium III	16065-83-1	5.2E+01	50.1					1.8E+06	44	43										
INORG	Chromium VI	18540-29-9	5.2E+01	50.1					1.9E+01	44	43										
INORG	Cobalt	7440-48-4	5.9E+01	50.1					4.5E+01	35							1	61			
INORG	Copper	7440-50-8	6.4E+01	50.1					3.5E+01	35							1	61			
INORG	Iron	7439-89-6	5.6E+01	50.1					2.5E+01	35											
INORG	Manganese	7439-96-5	5.5E+01	50.1					6.5E+01	35											
INORG	Mercury	7439-97-6	2.0E+02	67					1.0E+03	67		2.9E-01	2.0E+01	67	123	5.6E-02	1		2.0E-03	50.1	92
INORG	Nickel	7440-02-0	5.9E+01	50.1					6.5E+01	44	43						1	61			
INORG	Selenium	7782-49-2	7.9E+01	50.1					5.0E+00	44	43						40	48			
INORG	Silver	7440-22-4	1.1E+02	50.1					8.3E+00	44	43						1	61			
INORG	Thallium	7440-28-0	2.0E+02	50.1					7.1E+01	44	43						1	61			
INORG	Vanadium	7440-62-2	5.1E+01	50.1					1.0E+03	44	43						1	61			
INORG	Zinc	7440-66-6	6.5E+01	50.1					6.2E+01	44	43						1	61			

Chem Group	Chemical	Diffusivity in Air, D_{air} (m^2/d)			Diffusivity in Water, D_{water} (m^2/d)			Dermal Permeability Coefficient, K_p (cm/hr)			Dermal Absorption Fraction, ABS_d (unitless)			Fraction Absorbed, **FA** (unitless)			Enthalpy of Vaporization at Normal Boiling Point, $\Delta H_{v,b}$ (cal/mol)			Critical Temperature, T_C (Kelvin)			Normal Boiling Point, T_B (Kelvin)		
		Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes
SVOC	2,4,6-Trichlorophenol	2.7E-01	44		5.4E-05	44		3.4E-02	44	115	1.0E-01	62		1.0E+00	62		1.2E+04	44	118	7.5E+02	44	118	5.2E+02	44	118
SVOC	O,O,O-Triethyl phosphorothioate										1.0E-01	62		1.0E+00	62	114									
SVOC	1,3,5-Trinitrobenzene	2.1E-01	69		5.3E-05	69		6.1E-04	69	115	1.0E-01	62		1.0E+00	62	114									
INORG	Aluminum							1.0E-03	62			62													
INORG	Antimony		40	48		40	48	1.0E-03	62			62													
INORG	Arsenic		40	48		40	48	1.0E-03	62		3.0E-02	62													
INORG	Barium		40	48		40	48	1.0E-03	62			62													
INORG	Beryllium		40	48		40	48	1.0E-03	62			62													
INORG	Cadmium		40	48		40	48	1.0E-03	62		1.0E-03	62													
INORG	Chromium (total)		40	48		40	48	2.0E-03	62	45		62													
INORG	Chromium III							1.0E-03	62			62													
INORG	Chromium VI		40	48		40	48	2.0E-03	62			62													
INORG	Cobalt							4.0E-04	62			62													
INORG	Copper		40	48		40	48	1.0E-03	62			62													
INORG	Iron							1.0E-03	62			62													
INORG	Manganese							1.0E-03	62			62													
INORG	Mercury	2.7E-01	44		5.4E-05	44		1.0E-03	62			62					1.4E+04	44	118	1.8E+03	44	118	6.3E+02	44	118
INORG	Nickel		40	48		40	48	2.0E-04	62			62													
INORG	Selenium		40	48		40	48	1.0E-03	62			62													
INORG	Silver		40	48		40	48	6.0E-04	62			62													
INORG	Thallium		40	48		40	48	1.0E-03	62			62													
INORG	Vanadium		40	48		40	48	1.0E-03	62			62													
INORG	Zinc		40	48		40	48	6.0E-04	62			62													

Attachment A1: References and Notes For Physical and Chemical Properties Bway Corporation, Cincinnati, Ohio	
References:	
1	USEPA. 1992. Handbook of RCRA Ground-Water Monitoring Constituents. Chemical and Physical Properties (40 CFR Part 264, Appendix IX). EPA-530-R-92-022. September.
35	Baes III, C.F., R.D. Sharp, A.L. Sjoreen, and R.W. Shor. 1984. A Review and Analysis of Parameters for Assessing Transport of Released Radionuclides through Agriculture (AD-89-T-2-A-106) (formerly EPA078-D-X0304), Oak Ridge National Laboratory, ORNL-5786.
39	CHEMFATE data base. Syracuse Research Corporation.
40	Research Triangle Institute, Center for Environmental Analysis. 1995. Supplemental Technical Support Document for Hazardous Waste Identification Rule: Risk Assessment for Human and Ecological Receptors--Volume 1, TABLE A-1. November 1995.
44	USEPA. 1996. Soil Screening Guidance: Technical Background Document and User Guide. Office of Emergency and Remedial Response. EPA/540/R-95/128. May.
46	Lide et al. 1991. CRC Handbook of Chemistry and Physics.
50.1	USEPA. 1997. Superfund Chemical Data Matrix (SCDM). Office of Emergency and Remedial Response.
50.2	USEPA. 2004. Superfund Chemical Data Matrix (SCDM). Office of Emergency and Remedial Response. January.
52	USEPA. 1997. CHEM9 Compound Properties Estimation and Data. Version 1.00. Office of Air Quality Planning and Standards. July.
62	USEPA. 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. July.
67	USEPA. 1997. Mercury Study Report to Congress. EPA’s Office of Air Quality Planning and Standards and Office of Research and Development. December.
68	PHYSPROP data base. Syracuse Research Corporation.
69	USEPA. 2004. WATER9. Version 2.0.0. Office of Air Quality Planning and Standards. July.
70	USEPA. 2003. User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings. June 19.
71	USEPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. Office of Solid Waste and Emergency Response. OSWER 9355.4-24. December.
Notes:	
43	The value is associated with pH 6.8.
45	ENVIRON used the value for Chromium VI [CASRN 18540-29-9] presented in indicated reference as a surrogate.
48	Not Available or Not Applicable
53	min, max 1.32
55	Reference temperature is unspecified.
60	Hydrolyzes
61	Insoluble
64	min temperature: max is 30
66	Slightly soluble
82	ENVIRON used Equation (70) from Reference 44 to calculate Koc value using Log Kow value from indicated reference.
90	Indicated source cites CHEMCALC.
91	Indicated source cites CHEMEST.
92	Indicated source cites CHEMFATE.
93	Indicated source cites FATE.
94	Indicated source cites LIVECHEM.
111	ENVIRON used Equation (71) from Reference 44 to calculate Koc value using Log Kow value from indicated reference.
114	A value of 1 is conservatively used because EPA guidance does not provide a default value.
115	ENVIRON calculated Kp value using equation 3.8 (p.3-7) in reference 62 with log Kow from the indicated reference and the MW presented in table.
117	ENVIRON derived the FA based on Exhibit A-4 in the indicated reference.
118	From the 2001 Fact Sheet, "Correcting the Henry's Law Constant for Soil Temperature".
123	Value has been assigned a default reference temperature.
130	ENVIRON used 4-Methylphenol [CASRN 106-44-5] values from the indicated reference as a surrogate.

Attachment A1: Toxicity Values
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	Cancer Class			Oral Slope Factor, SF_{oral} $(mg/kg/d)^{-1}$			Dermal Slope Factor, SF_{derm} $(mg/kg/d)^{-1}$			Unit Risk Factor, URF $(mg/m^3)^{-1}$			Oral Reference Dose, RfD_{oral} (mg/kg/d)				Dermal Reference Dose, RfD_{derm} (mg/kg/d)				Reference Concentration, RfC (mg/m^3)			
			Group	Ref	Note	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	UF	Ref	Notes	Value	UF	Ref	Notes	Value	UF	Ref	Notes
VOC	Acetone	67-64-1	ID	1											9.0E-01	1,000	1		9.0E-01	1,000	125	104	3.1E+01	100	129	111
VOC	Acetonitrile	75-05-8	D	1																			6.0E-02	1,000	1	
VOC	Acrolein	107-02-8	ID	1											5.0E-04	100	1		5.0E-04	100	125	104	2.0E-05	1,000	1	
VOC	Acrylonitrile	107-13-1	B1	1		5.4E-01	1		5.4E-01	125	104	6.8E-02	1		4.0E-02	100	129	111	4.0E-02	100	125	104	2.0E-03	1,000	1	
VOC	Benzene	71-43-2	A	1		5.5E-02	1	68	5.5E-02	125	104	7.8E-03	1	60	4.0E-03	300	1		4.0E-03	300	125	104	3.0E-02	300	1	
VOC	Bromodichloromethane	75-27-4	B2	1		6.2E-02	1		6.2E-02	125	104	1.8E-02	1	4, 45	2.0E-02	1,000	1		2.0E-02	1,000	125	104	7.0E-02	1,000	1	4, 44
VOC	Bromoform	75-25-2	B2	1		7.9E-03	1		7.9E-03	125	104	1.1E-03	1		2.0E-02	1,000	1		2.0E-02	1,000	125	104			126	90
VOC	Bromomethane	74-83-9	ID	126											1.4E-03	1,000	1		1.4E-03	1,000	125	104	5.0E-03	100	1	
VOC	2-Butanone	78-93-3	ID	1											6.0E-01	1,000	1		6.0E-01	1,000	125	104	5.0E+00	300	1	
VOC	Carbon Disulfide	75-15-0													1.0E-01	100	1		1.0E-01	100	125	104	7.0E-01	30	1	
VOC	Carbon Tetrachloride	56-23-5	B2	1		1.3E-01	1		1.3E-01	125	104	1.5E-02	1		7.0E-04	1,000	1		7.0E-04	1,000	125	104	1.9E-01	30	129	111
VOC	2-Chloro-1,3-butadiene	126-99-8													2.0E-02	100	2	3, 26, 108	2.0E-02	100	125	104	7.0E-03	300	2	
VOC	3-Chloro-1-propene	107-05-1	C	1																			1.0E-03	3,000	1	
VOC	Chlorobenzene	108-90-7	D	1											2.0E-02	1,000	1		2.0E-02	1,000	125	104	5.0E-02	1,000	126	
VOC	Chloroethane	75-00-3	LC	126			126	90		125	104		126	45, 90	1.0E-01	3,000	126	116	1.0E-01	3,000	125	104	1.0E+01	300	1	
VOC	Chloroform	67-66-3	B2	1								2.3E-02	1		1.0E-02	1,000	1		1.0E-02	1,000	125	104	5.0E-02	100	117	
VOC	Chloromethane	74-87-3	D	1																			9.0E-02	1,000	1	
VOC	1,2-Dibromo-3-chloropropane	96-12-8	LC	126		8.0E-01	126		8.0E-01	125	104	6.0E+00	126		2.0E-04	3,000	126		2.0E-04	3,000	125	104	2.0E-04	1,000	1	
VOC	Dibromochloromethane	124-48-1	C	1		8.4E-02	1		8.4E-02	125	104	2.4E-02	1	4, 45	2.0E-02	1,000	1		2.0E-02	1,000	125	104	7.0E-02	1,000	1	4, 44
VOC	1,2-Dibromoethane	106-93-4	LC	1		2.0E+00	1		2.0E+00	125	104	6.0E-01	1		9.0E-03	3,000	1		9.0E-03	3,000	125	104	9.0E-03	300	1	
VOC	Dibromomethane	74-95-3													1.0E-02	1,000	2	3, 26, 108	1.0E-02	1,000	125	104	3.5E-02	1,000	2	3, 4, 26, 44, 108
VOC	trans-1,4-Dichloro-2-butene	110-57-6																								
VOC	1,2-Dichlorobenzene	95-50-1	D	1											9.0E-02	1,000	1		9.0E-02	1,000	125	104	2.4E-02		128	
VOC	1,3-Dichlorobenzene	541-73-1	D	1											3.0E-03		3		3.0E-03		125	104	8.0E-03		128	
VOC	1,4-Dichlorobenzene	106-46-7	C	2		2.4E-02	2	6	2.4E-02	125	104	6.3E-03	3	45	7.0E-02	100	129	111	7.0E-02	100	125	104	8.0E-01	100	1	
VOC	Dichlorodifluoromethane	75-71-8													2.0E-01	100	1		2.0E-01	100	125	104	2.0E-01	10,000	2	
VOC	1,1-Dichloroethane	75-34-3	SC	126											2.0E-01	3,000	126		2.0E-01	3,000	125	104	5.0E-01	1,000	2	3
VOC	1,2-Dichloroethane	107-06-2	B2	1		9.1E-02	1		9.1E-02	125	104	2.6E-02	1		2.0E-02	3,000	126		2.0E-02	3,000	125	104	5.0E-03	3,000	102	92
VOC	1,1-Dichloroethene	75-35-4	C	1											5.0E-02	100	1		5.0E-02	100	125	104	2.0E-01	30	1	
VOC	trans-1,2-Dichloroethene	156-60-5													2.0E-02	1,000	1		2.0E-02	1,000	125	104	6.0E-02	3,000	126	
VOC	1,2-Dichloropropane	78-87-5	B2	2		6.8E-02	2	6	6.8E-02	125	104				9.0E-02	1,000	129	111	9.0E-02	1,000	125	104	4.0E-03	300	1	
VOC	1,3-Dichloropropene (total)	542-75-6	B2	1		1.0E-01	1	77	1.0E-01	125	104	4.0E-03	1		3.0E-02	100	1		3.0E-02	100	125	104	2.0E-02	30	1	
VOC	1,4-Dioxane	123-91-1	B2	1		1.1E-02	1		1.1E-02	125	104				1.0E-01	100	129	111	1.0E-01	100	125	104	3.6E+00	30	129	111
VOC	Ethyl Benzene	100-41-4	D	1											1.0E-01	1,000	1		1.0E-01	1,000	125	104	1.0E+00	300	1	
VOC	Ethyl Methacrylate	97-63-2													9.0E-02	100	2		9.0E-02	100	125	104	3.2E-01	100	2	4, 44
VOC	2-Hexanone	591-78-6													4.0E-02	10,000	40		4.0E-02	10,000	125	104	5.0E-03	10,000	108	
VOC	Iodomethane	74-88-4																								
VOC	Isobutyl Alcohol	78-83-1													3.0E-01	1,000	1		3.0E-01	1,000	125	104	1.1E+00	1,000	1	4, 44
VOC	Methacrylonitrile	126-98-7													1.0E-04	3,000	1		1.0E-04	3,000	125	104	7.0E-04	3,000	2	3
VOC	4-Methyl-2-pentanone	108-10-1	ID	1													1	90			125	104	3.0E+00	300	1	
VOC	Methylene Chloride	75-09-2	B2	1		7.5E-03	1		7.5E-03	125	104	4.7E-04	1		6.0E-02	100	1		6.0E-02	100	125	104	1.0E+00	30	129	111
VOC	Methylmethacrylate	80-62-6	E	1											1.4E+00	100	1		1.4E+00	100	125	104	7.0E-01	10	1	
VOC	Pentachloroethane	76-01-7	LC	126		9.0E-02	126		9.0E-02	125	104		126	90			126	90			125	104			126	90
VOC	Propionitrile	107-12-0																								
VOC	Styrene	100-42-5													2.0E-01	1,000	1	6	2.0E-01	1,000	125	104	1.0E+00	30	1	
VOC	1,1,1,2-Tetrachloroethane	630-20-6	C	1		2.6E-02	1		2.6E-02	125	104	7.4E-03	1		3.0E-02	3,000	1		3.0E-02	3,000	125	104				
VOC	1,1,2,2-Tetrachloroethane	79-34-5	C	1		2.0E-01	1		2.0E-01	125	104	5.8E-02	1		6.0E-02	300	126		6.0E-02	300	125	104			88	90
VOC	Tetrachloroethene	127-18-4	C-B2	77		5.2E-02	77		5.2E-02	125	104	3.1E-03	77		1.0E-02	1,000	1		1.0E-02	1,000	125	104	4.0E-01	300	109	94
VOC	Toluene	108-88-3	ID	1											8.0E-02	3,000	1		8.0E-02	3,000	125	104	5.0E+00	10	1	
VOC	1,2,4-Trichlorobenzene	120-82-1	D	1											1.0E-02	1,000	1		1.0E-02	1,000	125	104	4.0E-03	1,000	126	
VOC	1,1,1-Trichloroethane	71-55-6	ID	1											2.0E+00	1,000	1		2.0E+00	1,000	125	104	5.0E+00	100	1	
VOC	1,1,2-Trichloroethane	79-00-5	C	1		5.7E-02	1		5.7E-02	125	104	1.6E-02	1		4.0E-03	1,000	1		4.0E-03	1,000	125	104				
VOC	Trichloroethene	79-01-6	C-B2	49	18	1.1E-02	49		1.1E-02	125	104	1.7E-03	49		6.0E-03	3,000	46	6, 97	6.0E-03	3,000	125	104	5.4E-01	300	129	111, 113, 116

Attachment A1: Toxicity Values
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	Cancer Class			Oral Slope Factor, SF_{oral} (mg/kg/d)$^{-1}$			Dermal Slope Factor, SF_{derm} (mg/kg/d)$^{-1}$			Unit Risk Factor, URF (mg/m^3)$^{-1}$			Oral Reference Dose, RfD_{oral} (mg/kg/d)				Dermal Reference Dose, RfD_{derm} (mg/kg/d)				Reference Concentration, RfC (mg/m^3)			
			Group	Ref	Note	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	UF	Ref	Notes	Value	UF	Ref	Notes	Value	UF	Ref	Notes
VOC	Trichlorofluoromethane	75-69-4													3.0E-01	1,000	1		3.0E-01	1,000	125	104	7.0E-01	10,000	2	3
VOC	1,2,3-Trichloropropane	96-18-4	B2	98		2.0E+00	98		2.0E+00	125	104				6.0E-03	1,000	1		6.0E-03	1,000	125	104	5.0E-03	300	97	
VOC	Vinyl Acetate	108-05-4													1.0E+00	100	2		1.0E+00	100	125	104	2.0E-01	30	1	
VOC	Vinyl Chloride	75-01-4	A	1		1.4E+00	1	78	1.4E+00	125	104	8.8E-03	1	79	3.0E-03	30	1		3.0E-03	30	125	104	1.0E-01	30	1	
VOC	Xylenes (total)	1330-20-7	ID	1											2.0E-01	1,000	1		2.0E-01	1,000	125	104	1.0E-01	300	1	
SVOC	Acenaphthene	83-32-9													6.0E-02	3,000	1		6.0E-02	3,000	125	104	2.1E-01	3,000	1	4, 44
SVOC	Acenaphthylene	208-96-8	D	1											3.0E-02	3,000	1	20	3.0E-02	3,000	125	104	1.1E-01	3,000	1	4, 20, 44
SVOC	Acetophenone	98-86-2	D	1											1.0E-01	3,000	1		1.0E-01	3,000	125	104	3.5E-01	3,000	1	4, 44
SVOC	2-Acetylaminofluorene	53-96-3																								
SVOC	4-Aminobiphenyl	92-67-1																								
SVOC	Aniline	62-53-3	B2	1		5.7E-03	1		5.7E-03	125	104				7.0E-03	1,000	126		7.0E-03	1,000	125	104	1.0E-03	3,000	1	
SVOC	Anthracene	120-12-7	D	1											3.0E-01	3,000	1		3.0E-01	3,000	125	104			2	90
SVOC	Aramite (total)	140-57-8	B2	1		2.5E-02	1		2.5E-02	125	104	7.1E-03	1		5.0E-02	100	2		5.0E-02	100	125	104				
SVOC	Benzo(a)anthracene	56-55-3	B2	1		7.3E-01	10	5	7.3E-01	125	104	8.9E-02	128	45			126	90			125	104			126	90
SVOC	Benzo(a)pyrene	50-32-8	B2	1		7.3E+00	1		7.3E+00	125	104	8.9E-01	128	45												
SVOC	Benzo(b)fluoranthene	205-99-2	B2	1		7.3E-01	10	5	7.3E-01	125	104	8.9E-02	128	45												
SVOC	Benzo(g,h,i)perylene	191-24-2	D	1											3.0E-02	3,000	1	20	3.0E-02	3,000	125	104	1.1E-01	3,000	1	4, 20, 44
SVOC	Benzo(k)fluoranthene	207-08-9	B2	1		7.3E-02	10	5	7.3E-02	125	104	8.9E-03	128	45												
SVOC	Benzyl Alcohol	100-51-6	ID	126											5.0E-01	300	126		5.0E-01	300	125	104	1.8E+00	300	126	4, 44
SVOC	bis(2-Chloroethoxy)methane	111-91-1	D	1											3.0E-03	3,000	126		3.0E-03	3,000	125	104	1.1E-02	3,000	126	4, 44
SVOC	bis(2-Chloroethyl) ether	111-44-4	B2	1		1.1E+00	1		1.1E+00	125	104	3.3E-01	1										1.2E-01	1,000	129	111, 113, 116
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	1		1.4E-02	1		1.4E-02	125	104	4.0E-03	1	4, 45	2.0E-02	1,000	1		2.0E-02	1,000	125	104	7.0E-02	1,000	1	4, 44
SVOC	4-Bromophenyl-phenyl ether	101-55-3	D	1																						
SVOC	2-sec-Butyl-4,6-dinitrophenol	88-85-7	D	1											1.0E-03	1,000	1		1.0E-03	1,000	125	104	3.5E-03	1,000	1	4, 44
SVOC	Butylbenzylphthalate	85-68-7	C	1		1.9E-03	126		1.9E-03	125	104	5.4E-04	126	4, 45	2.0E-01	1,000	1		2.0E-01	1,000	125	104	7.0E-01	1,000	1	4, 44
SVOC	4-Chloro-3-methylphenol	59-50-7													7.0E-01	300	126	116	7.0E-01	300	125	104	2.5E+00	300	126	4, 44, 116
SVOC	4-Chloroaniline	106-47-8	LC	126		5.4E-02	126		5.4E-02	125	104	1.5E-02	126	4, 45	4.0E-03	3,000	1		4.0E-03	3,000	125	104	1.4E-02	3,000	1	4, 44
SVOC	p-Chlorobenzilate	510-15-6	B2	2		2.7E-01	2		2.7E-01	125	104	7.8E-02	2		2.0E-02	300	1		2.0E-02	300	125	104				
SVOC	2-Chloronaphthalene	91-58-7													8.0E-02	3,000	1		8.0E-02	3,000	125	104	2.8E-01	3,000	1	4, 44
SVOC	2-Chlorophenol	95-57-8	ID	126											5.0E-03	1,000	1		5.0E-03	1,000	125	104	1.8E-02	1,000	1	4, 44
SVOC	4-Chlorophenyl-phenyl ether	7005-72-3																								
SVOC	Chrysene	218-01-9	B2	1		7.3E-03	10	5	7.3E-03	125	104	8.9E-04	128	45												
SVOC	Diallate (total)	2303-16-4	B2	2		6.1E-02	2		6.1E-02	125	104	1.7E-02	2	4, 45												
SVOC	Dibenz(a,h)anthracene	53-70-3	B2	1		7.3E+00	10	5	7.3E+00	125	104	8.9E-01	128	45												
SVOC	Dibenzofuran	132-64-9	D	1											1.0E-03		3		1.0E-03		125	104			126	90
SVOC	3,3'-Dichlorobenzidine	91-94-1	B2	1		4.5E-01	1		4.5E-01	125	104	1.3E-01	1	4, 45												
SVOC	2,4-Dichlorophenol	120-83-2	ID	126											3.0E-03	100	1		3.0E-03	100	125	104	1.1E-02	100	1	4, 44
SVOC	2,6-Dichlorophenol	87-65-0																								
SVOC	Diethylphthalate	84-66-2	D	1											8.0E-01	1,000	1		8.0E-01	1,000	125	104	2.8E+00	1,000	1	4, 44
SVOC	Dimethoate	60-51-5													2.0E-04	300	1		2.0E-04	300	125	104	7.0E-04	300	1	4, 44
SVOC	p-(Dimethylamino)azobenzene	60-11-7																								
SVOC	7,12-Dimethylbenz(a)anthracene	57-97-6																								
SVOC	3,3'-Dimethylbenzidine	119-93-7	LC	126		2.3E+00	126		2.3E+00	125	104						126	90			125	104			126	90
SVOC	a,a-Dimethylphenethylamine	122-09-8													1.0E-03		128		1.0E-03		125	104	3.5E-03		128	4, 44
SVOC	2,4-Dimethylphenol	105-67-9	ID	126											2.0E-02	3,000	1		2.0E-02	3,000	125	104			126	90
SVOC	Dimethylphthalate	131-11-3	D	1													2	90			125	104			2	90
SVOC	Di-n-butylphthalate	84-74-2	D	1											1.0E-01	1,000	1	6	1.0E-01	1,000	125	104			1	90
SVOC	4,6-Dinitro-2-methylphenol	534-52-1	ID	126											1.0E-04	3,000	126		1.0E-04	3,000	125	104			126	90
SVOC	1,3-Dinitrobenzene	99-65-0	D	1											1.0E-04	3,000	1		1.0E-04	3,000	125	104	3.5E-04	3,000	1	4, 44
SVOC	2,4-Dinitrophenol	51-28-5	ID	126											2.0E-03	1,000	1		2.0E-03	1,000	125	104			2	90
SVOC	2,4-Dinitrotoluene	121-14-2	B2	1	28	6.8E-01	1	28	6.8E-01	125	104				2.0E-03	100	1		2.0E-03	100	125	104			2	90
SVOC	2,6-Dinitrotoluene	606-20-2	B2	1	28	6.8E-01	1	28	6.8E-01	125	104	1.9E-01	1	4, 28, 45	1.0E-03	3,000	126		1.0E-03	3,000	125	104	3.5E-03	3,000	126	4, 44
SVOC	Di-n-octylphthalate	117-84-0													4.0E-02	1,000	126		4.0E-02	1,000	125	104			126	90

Attachment A1: Toxicity Values
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	Cancer Class			Oral Slope Factor, SF_{oral} $(mg/kg/d)^{-1}$			Dermal Slope Factor, SF_{derm} $(mg/kg/d)^{-1}$			Unit Risk Factor, URF $(mg/m^3)^{-1}$			Oral Reference Dose, RfD_{oral} (mg/kg/d)				Dermal Reference Dose, RfD_{derm} (mg/kg/d)				Reference Concentration, RfC (mg/m^3)			
			Group	Ref	Note	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	UF	Ref	Notes	Value	UF	Ref	Notes	Value	UF	Ref	Notes
SVOC	Diphenylamine	122-39-4													2.5E-02	100	1		2.5E-02	100	125	104	8.8E-02	100	1	4, 44
SVOC	Disulfoton	298-04-4													4.0E-05	1,000	1		4.0E-05	1,000	125	104	2.0E-04	30	129	111, 113, 116
SVOC	Ethylmethanesulfonate	62-50-0																								
SVOC	Famphur	52-85-7																								
SVOC	Fluoranthene	206-44-0	D	1											4.0E-02	3,000	1		4.0E-02	3,000	125	104	1.4E-01	3,000	1	4, 44
SVOC	Fluorene	86-73-7	D	1											4.0E-02	3,000	1		4.0E-02	3,000	125	104	1.4E-01	3,000	1	4, 44
SVOC	Hexachlorobenzene	118-74-1	B2	1		1.6E+00	1		1.6E+00	125	104	4.6E-01	1		8.0E-04	100	1		8.0E-04	100	125	104			1	90
SVOC	Hexachlorobutadiene	87-68-3	C	1		7.8E-02	1		7.8E-02	125	104	2.2E-02	1		1.0E-03	100	126		1.0E-03	100	125	104				
SVOC	Hexachlorocyclopentadiene	77-47-4	E	1											6.0E-03	1,000	1		6.0E-03	1,000	125	104	2.0E-04	100	1	
SVOC	Hexachloroethane	67-72-1	C	1		1.4E-02	1		1.4E-02	125	104	4.0E-03	1		1.0E-03	1,000	1		1.0E-03	1,000	125	104	5.8E+01	30	129	111, 113, 116
SVOC	Hexachloropropene	1888-71-7																								
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	1		7.3E-01	10	5	7.3E-01	125	104	8.9E-02	128	45												
SVOC	Isophorone	78-59-1	C	1		9.5E-04	1		9.5E-04	125	104				2.0E-01	1,000	1		2.0E-01	1,000	125	104			2	90
SVOC	Isosafrole (total)	120-58-1																								
SVOC	Methapyrilene	91-80-5																								
SVOC	3-Methylcholanthrene	56-49-5																								
SVOC	Methylmethanesulfonate	66-27-3																								
SVOC	2-Methylnaphthalene	91-57-6	ID	126											4.0E-03	1,000	1		4.0E-03	1,000	125	104			126	90
SVOC	Methylphenol (total)	1319-77-3													5.0E-03	1,000	2	6, 130	5.0E-03	1,000	125	104			1	90, 130
SVOC	Naphthalene	91-20-3	C	1											2.0E-02	3,000	1		2.0E-02	3,000	125	104	3.0E-03	3,000	1	
SVOC	1,4-Naphthoquinone	130-15-4																								
SVOC	1-Naphthylamine	134-32-7																								
SVOC	2-Naphthylamine	91-59-8																								
SVOC	2-Nitroaniline	88-74-4	ID	126											3.0E-03		126	131	3.0E-03		125	104	1.0E-04	3,000	126	
SVOC	3-Nitroaniline	99-09-2	C	126		2.1E-02	126		2.1E-02	125	104				3.0E-04	1,000	126		3.0E-04	1,000	125	104	1.0E-03	3,000	126	
SVOC	4-Nitroaniline	100-01-6	LC	126		2.1E-02	126		2.1E-02	125	104				3.0E-03	100	126		3.0E-03	100	125	104	4.0E-03	1,000	126	
SVOC	Nitrobenzene	98-95-3	D	1											5.0E-04	10,000	1	6	5.0E-04	10,000	125	104	2.0E-03	10,000	2	3
SVOC	2-Nitrophenol	88-75-5	ID	126																			5.0E-04	300	126	116
SVOC	4-Nitrophenol	100-02-7													8.0E-03		128		8.0E-03		125	104	2.8E-02		128	4, 44
SVOC	4-Nitroquinoline-1-oxide	56-57-5																								
SVOC	N-Nitrosodi-n-butylamine	924-16-3	B2	1		5.4E+00	1		5.4E+00	125	104	1.6E+00	1													
SVOC	N-Nitrosodiethylamine	55-18-5	B2	1		1.5E+02	1		1.5E+02	125	104	4.3E+01	1	4, 45												
SVOC	N-Nitrosodimethylamine	62-75-9	B2	1		5.1E+01	1		5.1E+01	125	104	1.4E+01	1		8.0E-06	3,000	126		8.0E-06	3,000	125	104				
SVOC	N-Nitrosodiphenylamine	86-30-6	B2	1		4.9E-03	1		4.9E-03	125	104				2.0E-02	3,000	126		2.0E-02	3,000	125	104			126	90, 98
SVOC	N-Nitroso-di-n-propylamine	621-64-7	B2	1		7.0E+00	1		7.0E+00	125	104	2.0E+00	1	4, 45												
SVOC	N-Nitrosomethylethylamine	10595-95-6	B2	1		2.2E+01	1		2.2E+01	125	104	6.3E+00	1	4, 45												
SVOC	N-Nitrosopiperidine	100-75-4																								
SVOC	N-Nitrosopyrrolidine	930-55-2	B2	1		2.1E+00	1		2.1E+00	125	104	6.1E-01	1													
SVOC	5-Nitro-o-toluidine	99-55-8	C	2		3.3E-02	2		3.3E-02	125	104	9.4E-03	2	4, 45												
SVOC	N-Nitrosomorpholine	59-89-2																								
SVOC	2,2'-oxybis(1-Chloropropane)	108-60-1	C	2		7.0E-02	2		7.0E-02	125	104	1.0E-02	2		4.0E-02		1		4.0E-02		125	104				
SVOC	Pentachlorobenzene	608-93-5													8.0E-04		1		8.0E-04		125	104	2.8E-03		1	4, 44
SVOC	Pentachloronitrobenzene	82-68-8													3.0E-03	300	1		3.0E-03	300	125	104	1.1E-02	300	1	4, 44
SVOC	Pentachlorophenol	87-86-5	B2	1		1.2E-01	1		1.2E-01	125	104	3.4E-02	1	4, 45	3.0E-02	100	1		3.0E-02	100	125	104	1.1E-01	100	1	4, 44
SVOC	Phenacetin	62-44-2																								
SVOC	Phenanthrene	85-01-8	D	1											3.0E-02	3,000	1	20	3.0E-02	3,000	125	104	1.1E-01	3,000	1	4, 20, 44
SVOC	Phenol	108-95-2	ID	1											3.0E-01	300	1		3.0E-01	300	125	104			1	90, 98
SVOC	p-Phenylene diamine	106-50-3													1.9E-01	100	2		1.9E-01	100	125	104	6.7E-01	100	2	4, 44
SVOC	Phorate	298-02-2													2.0E-04	200	2		2.0E-04	200	125	104	7.0E-04	200	2	4, 44
SVOC	2-Picoline	109-06-8																								
SVOC	Pronamide	23950-58-5													7.5E-02	100	1		7.5E-02	100	125	104	2.6E-01	100	1	4, 44
SVOC	Pyrene	129-00-0	NC	126											3.0E-02	3,000	1		3.0E-02	3,000	125	104	1.1E-01	3,000	1	4, 44
SVOC	Pyridine	110-86-1													1.0E-03	1,000	1		1.0E-03	1,000	125	104	3.5E-03	1,000	1	4, 44

Attachment A1: Toxicity Values
Bway Corporation, Cincinnati, Ohio

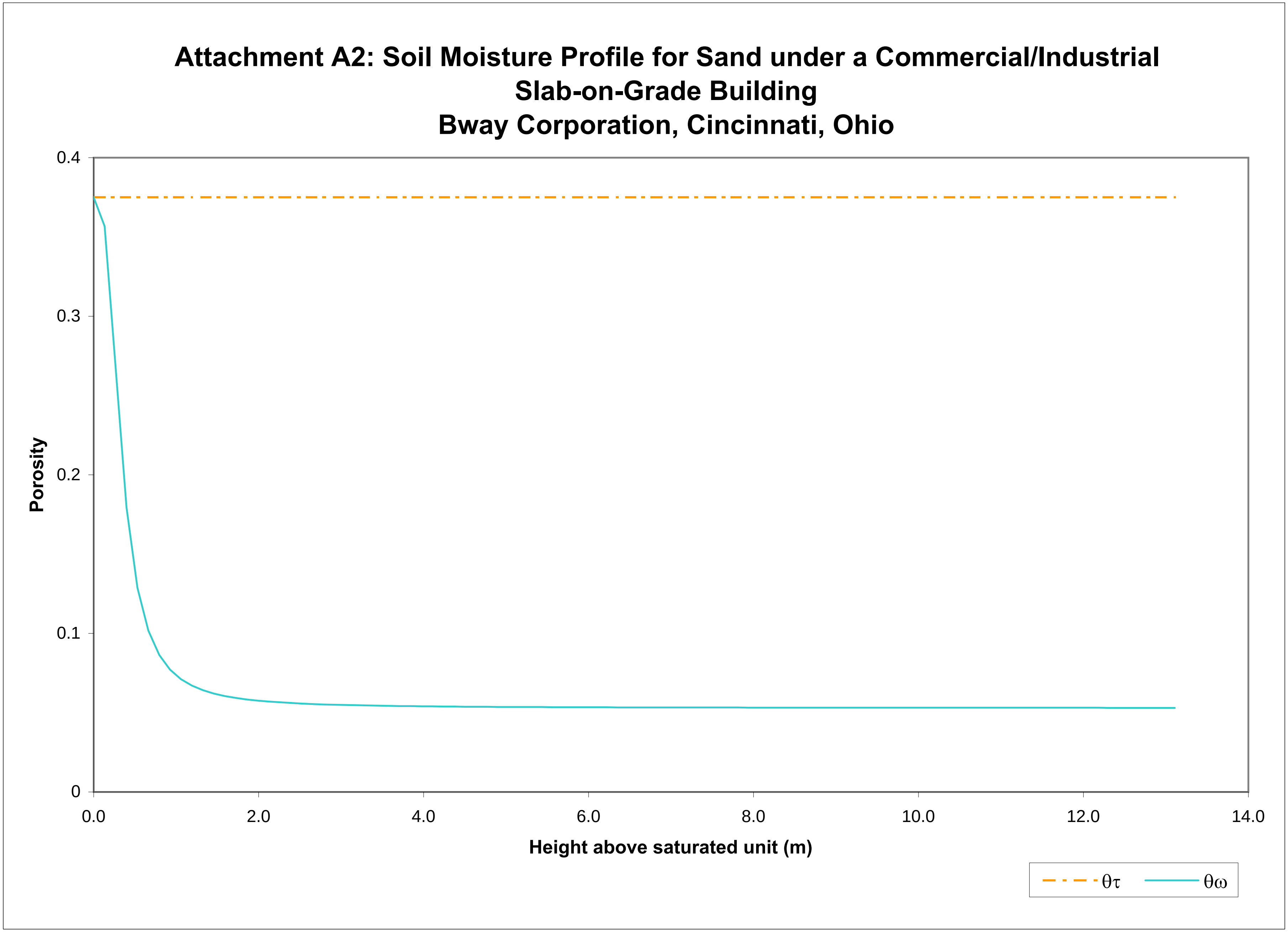
Chem Group	Chemical	CASRN	Cancer Class			Oral Slope Factor, SF_{oral} $(mg/kg/d)^{-1}$			Dermal Slope Factor, SF_{derm} $(mg/kg/d)^{-1}$			Unit Risk Factor, URF $(mg/m^3)^{-1}$			Oral Reference Dose, RfD_{oral} (mg/kg/d)				Dermal Reference Dose, RfD_{derm} (mg/kg/d)				Reference Concentration, RfC (mg/m^3)			
			Group	Ref	Note	Value	Ref	Notes	Value	Ref	Notes	Value	Ref	Notes	Value	UF	Ref	Notes	Value	UF	Ref	Notes	Value	UF	Ref	Notes
SVOC	Safrole (total)	94-59-7																								
SVOC	Sulfotepp	3689-24-5													5.0E-04	1,000	1		5.0E-04	1,000	125	104	1.8E-03	1,000	1	4, 44
SVOC	1,2,4,5-Tetrachlorobenzene	95-94-3													3.0E-04	1,000	1		3.0E-04	1,000	125	104	1.1E-03	1,000	1	4, 44
SVOC	2,3,4,6-Tetrachlorophenol	58-90-2													3.0E-02	1,000	1		3.0E-02	1,000	125	104	1.1E-01	1,000	1	4, 44
SVOC	Thionazin	297-97-2																								
SVOC	o-Toluidine	95-53-4	B2	2		2.4E-01	2		2.4E-01	125	104	6.9E-02	2	4, 45												
SVOC	2,4,5-Trichlorophenol	95-95-4	ID	126											1.0E-01	1,000	1		1.0E-01	1,000	125	104			2	90
SVOC	2,4,6-Trichlorophenol	88-06-2	B2	1		1.1E-02	1		1.1E-02	125	104	3.1E-03	1		1.0E-03	3,000	126		1.0E-03	3,000	125	104			126	90
SVOC	O,O,O-Triethyl phosphorothioate	126-68-1																								
SVOC	1,3,5-Trinitrobenzene	99-35-4													3.0E-02	100	1		3.0E-02	100	125	104	1.1E-01	100	1	4, 44
INORG	Aluminum	7429-90-5	ID	126			90	90		125	104		90	90	1.0E+00	100	126		1.0E+00	100	125	104	5.0E-03	300	126	
INORG	Antimony	7440-36-0													4.0E-04	1,000	1		6.0E-05	1,000	125	104	1.4E-03	1,000	1	4, 44
INORG	Arsenic	7440-38-2	A	1		1.5E+00	1		1.5E+00	125	104	4.3E+00	1		3.0E-04	3	1		3.0E-04	3	125	104				
INORG	Barium	7440-39-3	NC	1											2.0E-01	300	1		1.4E-02	300	125	104			1	90
INORG	Beryllium	7440-41-7	B1	1								2.4E+00	1		2.0E-03	300	1		1.4E-05	300	125	104	2.0E-05	10	1	
INORG	Cadmium	7440-43-9	B1	1								1.8E+00	1		1.0E-03	10	1	95	2.5E-05	10	125	104	2.0E-04		3	44
INORG	Chromium (total)	7440-47-3										1.2E+01	1	8	3.0E-03	900	1	8	7.5E-05	900	125	104	1.0E-04	300	1	8, 59
INORG	Chromium III	16065-83-1	D	1											1.5E+00	1,000	1		2.0E-02	1,000	125	104	5.3E+00	1,000	1	4, 44
INORG	Chromium VI	18540-29-9	A	1								1.2E+01	1		3.0E-03	900	1		7.5E-05	900	125	104	1.0E-04	300	1	59
INORG	Cobalt	7440-48-4	LC	126								2.8E+00	126		2.0E-02	10	126		2.0E-02	10	125	104	2.0E-05	100	126	
INORG	Copper	7440-50-8	D	1											4.0E-02	2	50	49	4.0E-02	2	125	104	1.4E-01	2	50	4, 44, 49
INORG	Iron	7439-89-6	D	91			91	90		125	104		91	90	7.0E-01	2	126		7.0E-01	2	125	104			92	90
INORG	Manganese	7439-96-5	D	1											1.4E-01	1	1		8.4E-03	1	125	104	5.0E-05	1,000	1	
INORG	Mercury	7439-97-6	D	1											3.0E-04	1,000	1	51	2.1E-05	1,000	125	104	3.0E-04	30	1	
INORG	Nickel	7440-02-0	A	1								2.4E-01	1		2.0E-02	300	1		8.0E-04	300	125	104	9.0E-05	30	129	111
INORG	Selenium	7782-49-2	D	1											5.0E-03	3	1		5.0E-03	3	125	104	1.8E-02	3	1	4, 44
INORG	Silver	7440-22-4	D	1											5.0E-03	3	1		2.0E-04	3	125	104	1.0E-05	1,000	83	
INORG	Thallium	7440-28-0													7.0E-05	3,000	52	49	7.0E-05	3,000	125	104	2.5E-04	3,000	52	4, 44, 49
INORG	Vanadium	7440-62-2													7.0E-03	100	2	6	1.8E-04	100	125	104	2.5E-02	100	2	4, 6, 44
INORG	Zinc	7440-66-6	ID	1											3.0E-01	3	1		3.0E-01	3	125	104	1.1E+00	3	1	4, 44

Attachment A1: References and Notes for Toxicity Values Bway Corporation, Cincinnati, Ohio	
References:	
1	USEPA. Integrated Risk Information System (IRIS). On-line database.
2	USEPA. 1997. Health Effects Assessment Summary Tables (HEAST). FY-1997 Update. EPA 540/R-97-036. July.
3	USEPA. Region III. 2007. Risk-Based Concentration Table. April.
10	USEPA. 1993. Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons. EPA/600/2-93/089. July.
40	USEPA. NCEA. 1993. Risk Assessment Issue paper for: Derivation of a Provisional RfD for 2-Hexanone (Methyl-n-butyl ketone) [CASRN 591-78-6]. June 24.
46	USEPA. NCEA. 1995. Risk Assessment Issue paper for: Provisional oral RfD for Trichloroethylene [CASRN 79-01-6].
49	USEPA. NCEA. 1995. Risk Assessment Issue paper for: Carcinogenicity Information for Trichloroethylene (TCE) [CASRN 79-01-6]. September 6.
50	USEPA. 56 FR 26460, June 7, 1991. Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper. Final Rule.
52	USEPA. 57 FR 31776, July 17, 1992. National Primary Drinking Water Regulations -- Synthetic Organic Chemicals and Inorganic Chemicals; National Primary Drinking Water Regulations Implementation. Final Rule.
77	USEPA. NCEA. 2001. Risk Assessment Issue Paper for Carcinogenicity Information for Tetrachloroethylene (perchloroethylene, PERC) [CASRN 127-18-4]. December 20.
83	USEPA. NCEA. 1994. Risk Assessment Issue Paper for: Derivation of a Provisional RfC for Silver [CASRN 7440-22-4]. June 30.
88	USEPA. NCEA. 2002. Risk Assessment Issue paper for: Derivation of a Provisional RfC for 1,1,2,2-Tetrachloroethane[CASRN 79-34-5]. January 15.
90	USEPA. NCEA. 2001. Evaluation of Carcinogenicity of Aluminum [CASRN 7429-90-5]. July 26.
91	USEPA. NCEA. 2001. Evaluation of Carcinogenicity of Iron [CASRN 7439-89-6] and Compounds. November 14.
92	USEPA. NCEA. 2001. Risk Assessment Issue Paper for: Derivation of a Provisional RfC for Iron [CASRN 7439-89-6] and Compounds. November 14.
97	USEPA. NCEA. Draft Risk Assessment Issue Paper for: Derivation of Systemic Toxicity of 1,2,3-Trichloropropane [CASRN 96-18-4].
98	USEPA. NCEA. Draft Risk Assessment Issue Paper for: Evaluation of the Carcinogenicity of 1,2,3-Trichloropropane [CASRN 96-18-4].
102	USEPA. NCEA. 1993. Risk Assessment Issue paper for: Derivation of a Provisional Inhalation RfC for 1,2-Dichloroethane [CASRN 107-06-2]. April 5.
108	USEPA. NCEA. 1993. Risk Assessment Issue paper for: Derivation of a Provisional RfC for 2-Hexanone (Methyl-n-butyl ketone) [CASRN 591-78-6]. June 24.
109	USEPA. NCEA. 1997. Risk Assessment Issue Paper for: Derivation of a Provisional RfC for Tetrachloroethylene (perchloroethylene, PERC) [CASRN 127-18-4]. June 20.
117	USEPA. NCEA. 2003. Risk Assessment Issue Paper for: Derivation of Provisional Subchronic and Chronic RfCs for Chloroform [CASRN 67-66-3]. January 23.
125	USEPA. 2004. Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. July.
126	Provisional Peer Reviewed Toxicity Values for Superfund (PPRTV) Database.
128	USEPA. Region 6. 2006. Human Health Medium-Specific Screening Levels. December.
129	ATSDR. 2007. Minimal Risk Levels. November.
Notes:	
3	HEAST Alternate Method.
4	ENVIRON obtained value by route-to-route extrapolation.
5	Based on potency relative to Benzo(a)pyrene [CASRN 50-32-8], as described in the indicated reference.
6	Under review, according to IRIS.
8	ENVIRON used Chromium VI [CASRN 18540-29-9] value from the indicated reference as a surrogate.
18	Not verifiable, according to IRIS.
20	ENVIRON used Pyrene [CASRN 129-00-0] value from the indicated reference as a surrogate.
26	USEPA obtained value by route-to-route extrapolation.

Attachment A1: References and Notes for Toxicity Values Bway Corporation, Cincinnati, Ohio	
28	USEPA used 2,4-,2,6-Dinitrotolunene mixture value from IRIS (reference 1) as a surrogate.
44	ENVIRON derived inhalation RfC from inhalation RfD value presented in the indicated reference, using standard USEPA methodology presented in HEAST.
45	ENVIRON derived inhalation URF from Inhalation Slope Factor value presented in the indicated reference, using standard USEPA methodology presented in HEAST.
49	ENVIRON derived oral RfD from adverse health effect level value presented in the indicated reference.
51	ENVIRON used Mercuric Chloride [CASRN 7487-94-7] value from the indicated reference as a surrogate.
59	This RfD is for particulates. The RfD for chromic acid mists and dissolved Chromium VI aerosols is 0.000008 mg/m3.
60	IRIS provides a range of 2.2E-6 to 7.8E-6 (ug/m3)-1 as the inhalation URF for Benzene.
68	IRIS provides a range of 1.5E-2 to 5.5E-2 (mg/kg/d)-1 as the oral Slope Factor for Benzene.
77	IRIS provides an alternate slope factor of 5E-2; however, USEPA does not recommend its use, due to the higher uncertainty in the delivered dose in the supporting study.
78	IRIS recommends an oral Slope Factor for Vinyl Chloride of 7.2E-1 (mg/kg/d)-1 to account for continuous lifetime exposure during adulthood; a twofold increase to 1.4 (mg/kg/d)-1 is recommended to account for continuous exposure from birth.
79	IRIS recommends an inhalation URF for Vinyl Chloride of 4.4E-6 (ug/m3)-1 to account for continuous lifetime exposure during adulthood; a twofold increase to 8.8E-6 (ug/m3)-1 is recommended to account for continuous exposure from birth.
90	Inadequate data exist to derive a toxicity value, according to the indicated reference.
92	NCEA directed ENVIRON to use outdated value.
94	Two provisional RfC values are presented in the indicated reference (4E-1 and 6E-1 mg/m3). Personal communication with NCEA indicated that either RfC is acceptable and the RfC should be chosen on a case-by-case basis.
95	This RfD is used to evaluate dietary exposures. A RfD of 0.0005 mg/kg/day is used to evaluate water ingestion exposures.
97	ENVIRON used withdrawn source.
98	Route-to-route extrapolation is not appropriate, according to the indicated reference.
104	Dermal toxicity value is extrapolated from oral toxicity value in accordance with the referenced USEPA guidance.
108	Assumes an inhalation absoption factor of 0.5.
111	Value as published is an MRL in the indicated reference.
113	The value is derived for intermediate exposure durations from 2 weeks to 1 year, rather than the subchronic period of 2 weeks to 7 years as defined in USEPA RAGS Part A (1989).
116	ENVIRON used subchronic value as a surrogate for the chronic value.
130	ENVIRON used 4-Methylphenol [CASRN 106-44-5] values from the indicated reference as a surrogate.
131	USEPA adopted the 4-Nitroaniline [CASRN 100-01-6] value as the value for the indicated chemical.

ATTACHMENT A2

Calculation of Vapor Migration to Indoor Air Criteria


Attachment A2: Soil Moisture Profile for Sand under a Commercial/Industrial
Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio
Porosity
0.4
0.3
0.2
0.1
0
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
Height above saturated unit (m)
θτ
θω

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Groundwater
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	C_{bldg} (L-water/m^3)
VOC	Acetone	67-64-1	1.1E+00	9.8E-05	1.1E-03	1.7E-01	1.4E-01	4.3E-05	4.6E-05
VOC	Acetonitrile	75-05-8	1.1E+00	1.5E-04	1.1E-03	1.8E-01	1.5E-01	4.5E-05	5.1E-05
VOC	Acrolein	107-02-8	9.5E-01	1.0E-04	4.1E-03	1.5E-01	9.5E-02	3.6E-05	1.5E-04
VOC	Acrylonitrile	107-13-1	1.0E+00	1.1E-04	3.3E-03	1.7E-01	1.1E-01	3.9E-05	1.3E-04
VOC	Benzene	71-43-2	7.6E-01	8.5E-05	1.5E-01	1.2E-01	1.2E-02	7.2E-06	1.1E-03
VOC	Bromodichloromethane	75-27-4	2.6E-01	9.2E-05	4.1E-02	4.2E-02	1.8E-02	1.0E-05	4.2E-04
VOC	Bromoform	75-25-2	1.3E-01	8.9E-05	1.2E-02	2.1E-02	1.5E-02	9.0E-06	1.1E-04
VOC	Bromomethane	74-83-9	6.3E-01	1.0E-04	1.9E-01	1.0E-01	1.1E-02	6.7E-06	1.3E-03
VOC	2-Butanone	78-93-3	7.0E-01	8.5E-05	1.8E-03	1.1E-01	8.6E-02	3.4E-05	6.1E-05
VOC	Carbon Disulfide	75-15-0	9.0E-01	8.6E-05	8.7E-01	1.5E-01	2.8E-03	1.8E-06	1.6E-03
VOC	Carbon Tetrachloride	56-23-5	6.7E-01	7.6E-05	8.2E-01	1.1E-01	2.5E-03	1.6E-06	1.3E-03
VOC	2-Chloro-1,3-butadiene	126-99-8	8.6E-01	8.6E-05	1.0E+00	1.4E-01	2.4E-03	1.6E-06	1.6E-03
VOC	3-Chloro-1-propene	107-05-1	6.9E-01	6.9E-05	2.9E-01	1.1E-01	5.6E-03	3.5E-06	1.0E-03
VOC	Chlorobenzene	108-90-7	6.3E-01	7.5E-05	8.9E-02	1.0E-01	1.5E-02	9.0E-06	8.0E-04
VOC	Chloroethane	75-00-3	2.3E+00	9.9E-05	3.1E-01	3.8E-01	8.8E-03	5.4E-06	1.7E-03
VOC	Chloroform	67-66-3	9.0E-01	8.6E-05	1.0E-01	1.5E-01	1.7E-02	9.8E-06	9.8E-04
VOC	Chloromethane	74-87-3	1.1E+00	5.6E-05	3.2E-01	1.8E-01	4.7E-03	3.0E-06	9.4E-04
VOC	1,2-Dibromo-3-chloropropane	96-12-8	6.9E-01	6.9E-05	3.9E-03	1.1E-01	6.9E-02	2.9E-05	1.1E-04
VOC	Dibromochloromethane	124-48-1	1.7E-01	9.1E-05	2.2E-02	2.8E-02	1.7E-02	9.6E-06	2.2E-04
VOC	1,2-Dibromoethane	106-93-4	3.7E-01	7.3E-05	2.3E-02	6.0E-02	2.6E-02	1.4E-05	3.2E-04
VOC	Dibromomethane	74-95-3	6.9E-01	6.9E-05	2.8E-02	1.1E-01	3.2E-02	1.7E-05	4.6E-04
VOC	trans-1,4-Dichloro-2-butene	110-57-6	5.7E-01	8.0E-05	2.3E-03	9.3E-02	6.9E-02	2.9E-05	6.8E-05
VOC	1,2-Dichlorobenzene	95-50-1	6.0E-01	6.8E-05	4.1E-02	9.7E-02	2.4E-02	1.3E-05	5.3E-04
VOC	1,3-Dichlorobenzene	541-73-1	6.0E-01	6.8E-05	9.3E-02	9.7E-02	1.4E-02	8.1E-06	7.5E-04
VOC	1,4-Dichlorobenzene	106-46-7	6.0E-01	6.8E-05	5.4E-02	9.7E-02	2.0E-02	1.1E-05	6.0E-04
VOC	Dichlorodifluoromethane	75-71-8	6.9E-01	6.9E-05	1.1E+01	1.1E-01	5.3E-04	3.5E-07	3.9E-03
VOC	1,1-Dichloroethane	75-34-3	6.4E-01	9.1E-05	1.5E-01	1.0E-01	1.2E-02	7.0E-06	1.1E-03
VOC	1,2-Dichloroethane	107-06-2	9.0E-01	8.6E-05	2.5E-02	1.5E-01	4.2E-02	2.1E-05	5.2E-04
VOC	1,1-Dichloroethene	75-35-4	7.8E-01	9.0E-05	7.6E-01	1.3E-01	3.2E-03	2.0E-06	1.5E-03
VOC	trans-1,2-Dichloroethene	156-60-5	6.1E-01	1.0E-04	2.6E-01	9.9E-02	8.3E-03	5.1E-06	1.4E-03
VOC	1,2-Dichloropropane	78-87-5	6.8E-01	7.5E-05	7.2E-02	1.1E-01	1.8E-02	1.0E-05	7.5E-04
VOC	1,3-Dichloropropene (total)	542-75-6	5.4E-01	8.6E-05	4.4E-01	8.8E-02	4.6E-03	2.9E-06	1.3E-03
VOC	1,4-Dioxane	123-91-1	2.0E+00	8.6E-05	1.3E-04	3.2E-01	2.9E-01	5.8E-05	7.3E-06

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Groundwater
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	C_{bldg} (L-water/m^3)
VOC	Ethyl Benzene	100-41-4	6.5E-01	6.7E-05	1.8E-01	1.1E-01	7.9E-03	4.9E-06	9.1E-04
VOC	Ethyl Methacrylate	97-63-2	6.9E-01	6.9E-05	2.4E-02	1.1E-01	3.4E-02	1.8E-05	4.2E-04
VOC	2-Hexanone	591-78-6	7.4E-01	7.6E-05	2.4E-03	1.2E-01	8.3E-02	3.3E-05	8.0E-05
VOC	Iodomethane	74-88-4	4.5E-01	6.7E-05	1.4E-01	7.4E-02	9.0E-03	5.5E-06	8.0E-04
VOC	Isobutyl Alcohol	78-83-1	6.9E-01	6.9E-05	3.3E-04	1.1E-01	1.0E-01	3.7E-05	1.2E-05
VOC	Methacrylonitrile	126-98-7	6.9E-01	6.9E-05	8.0E-03	1.1E-01	5.5E-02	2.5E-05	2.0E-04
VOC	4-Methyl-2-pentanone	108-10-1	6.5E-01	6.7E-05	4.3E-03	1.1E-01	6.3E-02	2.8E-05	1.2E-04
VOC	Methylene Chloride	75-09-2	8.7E-01	1.0E-04	6.2E-02	1.4E-01	2.7E-02	1.5E-05	9.0E-04
VOC	Methylmethacrylate	80-62-6	6.7E-01	7.4E-05	1.0E-02	1.1E-01	5.0E-02	2.4E-05	2.4E-04
VOC	Pentachloroethane	76-01-7	5.7E-01	6.3E-05	5.1E-02	9.3E-02	1.9E-02	1.1E-05	5.6E-04
VOC	Propionitrile	107-12-0	1.1E+00	1.2E-04	1.5E-03	1.7E-01	1.3E-01	4.2E-05	6.5E-05
VOC	Styrene	100-42-5	6.1E-01	6.9E-05	6.4E-02	1.0E-01	1.8E-02	1.0E-05	6.6E-04
VOC	1,1,1,2-Tetrachloroethane	630-20-6	6.1E-01	6.8E-05	7.2E-02	1.0E-01	1.6E-02	9.6E-06	6.9E-04
VOC	1,1,2,2-Tetrachloroethane	79-34-5	6.1E-01	6.8E-05	7.9E-03	1.0E-01	5.1E-02	2.4E-05	1.9E-04
VOC	Tetrachloroethene	127-18-4	6.2E-01	7.1E-05	4.5E-01	1.0E-01	3.9E-03	2.5E-06	1.1E-03
VOC	Toluene	108-88-3	7.5E-01	7.4E-05	1.7E-01	1.2E-01	9.7E-03	5.9E-06	9.8E-04
VOC	1,2,4-Trichlorobenzene	120-82-1	2.6E-01	7.1E-05	2.8E-02	4.2E-02	1.9E-02	1.1E-05	3.0E-04
VOC	1,1,1-Trichloroethane	71-55-6	6.7E-01	7.6E-05	4.6E-01	1.1E-01	4.1E-03	2.6E-06	1.2E-03
VOC	1,1,2-Trichloroethane	79-00-5	6.7E-01	7.6E-05	2.2E-02	1.1E-01	3.7E-02	1.9E-05	4.1E-04
VOC	Trichloroethene	79-01-6	6.8E-01	7.9E-05	2.7E-01	1.1E-01	6.7E-03	4.2E-06	1.1E-03
VOC	Trichlorofluoromethane	75-69-4	7.5E-01	8.4E-05	3.4E+00	1.2E-01	1.0E-03	6.6E-07	2.2E-03
VOC	1,2,3-Trichloropropane	96-18-4	6.1E-01	6.8E-05	1.2E-02	1.0E-01	4.3E-02	2.1E-05	2.6E-04
VOC	Vinyl Acetate	108-05-4	7.3E-01	7.9E-05	1.3E-02	1.2E-01	5.0E-02	2.3E-05	3.1E-04
VOC	Vinyl Chloride	75-01-4	9.2E-01	1.1E-04	8.6E-01	1.5E-01	3.4E-03	2.2E-06	1.9E-03
VOC	Xylenes (total)	1330-20-7	6.7E-01	7.6E-05	1.6E-01	1.1E-01	1.0E-02	6.1E-06	9.6E-04
SVOC	Acenaphthene	83-32-9	3.6E-01	6.6E-05	2.6E-03	5.9E-02	4.5E-02	2.2E-05	5.6E-05
SVOC	Acenaphthylene	208-96-8	3.9E-01	6.0E-05	1.3E-03	6.3E-02	5.2E-02	2.4E-05	3.1E-05
SVOC	Acetophenone	98-86-2	6.9E-01	6.9E-05	2.9E-04	1.1E-01	1.0E-01	3.7E-05	1.1E-05
SVOC	2-Acetylaminofluorene	53-96-3	2.1E-01	5.2E-05	3.5E-05	3.4E-02	3.4E-02	1.8E-05	6.2E-07
SVOC	4-Aminobiphenyl	92-67-1	3.4E-01	6.0E-05	4.4E-09	5.6E+00	6.5E+00	8.8E-05	3.9E-10
SVOC	Aniline	62-53-3	6.0E-01	7.2E-05	2.1E-05	1.0E-01	1.0E-01	3.7E-05	7.8E-07
SVOC	Anthracene	120-12-7	2.8E-01	6.7E-05	9.5E-04	4.6E-02	4.0E-02	2.0E-05	1.9E-05
SVOC	Aramite (total)	140-57-8	1.6E-01	4.0E-05	2.1E-05	2.7E-02	2.8E-02	1.5E-05	3.2E-07

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Groundwater
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	C_{bldg} (L-water/m^3)
SVOC	Benzo(a)anthracene	56-55-3	4.4E-01	7.8E-05	3.7E-05	7.2E-02	7.3E-02	3.0E-05	1.1E-06
SVOC	Benzo(a)pyrene	50-32-8	3.7E-01	7.8E-05	9.0E-06	6.4E-02	6.6E-02	2.9E-05	2.6E-07
SVOC	Benzo(b)fluoranthene	205-99-2	2.0E-01	4.8E-05	1.1E-03	3.2E-02	2.8E-02	1.5E-05	1.6E-05
SVOC	Benzo(g,h,i)perylene	191-24-2	1.9E-01	4.5E-05	1.6E-06	4.2E-02	4.6E-02	2.2E-05	3.5E-08
SVOC	Benzo(k)fluoranthene	207-08-9	2.0E-01	4.8E-05	7.1E-06	3.4E-02	3.6E-02	1.8E-05	1.3E-07
SVOC	Benzyl Alcohol	100-51-6	6.1E-01	7.8E-05	4.4E-06	1.1E-01	1.1E-01	3.9E-05	1.7E-07
SVOC	bis(2-Chloroethoxy)methane	111-91-1	3.8E-01	7.3E-05	1.9E-06	7.7E-02	8.2E-02	3.3E-05	6.3E-08
SVOC	bis(2-Chloroethyl) ether	111-44-4	6.0E-01	6.5E-05	3.5E-04	9.7E-02	8.7E-02	3.4E-05	1.2E-05
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	3.0E-01	3.2E-05	9.1E-07	6.3E-02	6.8E-02	2.9E-05	2.6E-08
SVOC	4-Bromophenyl-phenyl ether	101-55-3	2.3E-01	5.9E-05	1.3E-03	3.7E-02	3.2E-02	1.7E-05	2.2E-05
SVOC	2-sec-Butyl-4,6-dinitrophenol	88-85-7	6.9E-01	6.9E-05	5.1E-06	1.2E-01	1.2E-01	4.1E-05	2.1E-07
SVOC	Butylbenzylphthalate	85-68-7	1.5E-01	4.2E-05	1.5E-05	2.6E-02	2.6E-02	1.4E-05	2.1E-07
SVOC	4-Chloro-3-methylphenol	59-50-7	5.2E-01	8.2E-05	4.5E-06	9.2E-02	9.7E-02	3.6E-05	1.6E-07
SVOC	4-Chloroaniline	106-47-8	4.2E-01	8.7E-05	5.9E-06	7.4E-02	7.7E-02	3.2E-05	1.9E-07
SVOC	p-Chlorobenzilate	510-15-6	6.9E-01	6.9E-05	8.1E-07	1.5E-01	1.6E-01	4.6E-05	3.8E-08
SVOC	2-Chloronaphthalene	91-58-7	4.3E-01	7.6E-05	3.5E-03	6.9E-02	4.9E-02	2.3E-05	8.3E-05
SVOC	2-Chlorophenol	95-57-8	4.3E-01	8.2E-05	8.4E-03	7.0E-02	4.2E-02	2.1E-05	1.7E-04
SVOC	4-Chlorophenyl-phenyl ether	7005-72-3	2.5E-01	6.6E-05	2.5E-03	4.0E-02	3.2E-02	1.7E-05	4.2E-05
SVOC	Chrysene	218-01-9	2.1E-01	5.4E-05	9.6E-04	3.5E-02	3.1E-02	1.6E-05	1.6E-05
SVOC	Diallate (total)	2303-16-4	1.8E-01	4.6E-05	4.3E-05	3.0E-02	3.1E-02	1.6E-05	6.9E-07
SVOC	Dibenz(a,h)anthracene	53-70-3	1.7E-01	4.5E-05	4.2E-08	4.5E-01	5.2E-01	6.7E-05	2.8E-09
SVOC	Dibenzofuran	132-64-9	2.1E-01	5.2E-05	3.9E-05	3.4E-02	3.4E-02	1.8E-05	6.9E-07
SVOC	3,3'-Dichlorobenzidine	91-94-1	1.7E-01	5.8E-05	3.2E-08	7.6E-01	8.8E-01	7.2E-05	2.3E-09
SVOC	2,4-Dichlorophenol	120-83-2	3.0E-01	7.6E-05	4.4E-05	4.9E-02	5.0E-02	2.3E-05	1.0E-06
SVOC	2,6-Dichlorophenol	87-65-0	4.2E-01	7.6E-05	4.5E-04	6.9E-02	6.3E-02	2.8E-05	1.2E-05
SVOC	Diethylphthalate	84-66-2	2.2E-01	5.5E-05	6.0E-06	4.0E-02	4.2E-02	2.1E-05	1.2E-07
SVOC	Dimethoate	60-51-5	6.9E-01	6.9E-05	6.9E-10	4.0E+01	4.6E+01	2.8E-04	1.9E-10
SVOC	p-(Dimethylamino)azobenzene	60-11-7	2.2E-01	5.5E-05	4.5E-09	4.9E+00	5.7E+00	8.6E-05	3.9E-10
SVOC	7,12-Dimethylbenz(a)anthracene	57-97-6	6.9E-01	6.9E-05	3.5E-07	1.9E-01	2.1E-01	5.2E-05	1.8E-08
SVOC	3,3'-Dimethylbenzidine	119-93-7	6.9E-01	6.9E-05	7.1E-10	3.9E+01	4.5E+01	2.7E-04	1.9E-10
SVOC	a,a-Dimethylphenethylamine	122-09-8			1.6E-05				
SVOC	2,4-Dimethylphenol	105-67-9	5.0E-01	7.5E-05	3.6E-05	8.3E-02	8.3E-02	3.3E-05	1.2E-06
SVOC	Dimethylphthalate	131-11-3	4.9E-01	5.4E-05	1.2E-06	9.8E-02	1.1E-01	3.8E-05	4.5E-08

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Groundwater Bway Corporation, Cincinnati, Ohio									
Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	C_{bldg} (L-water/m^3)
SVOC	Di-n-butylphthalate	84-74-2	3.8E-01	6.8E-05	1.1E-08	2.6E+00	3.0E+00	8.0E-05	8.6E-10
SVOC	4,6-Dinitro-2-methylphenol	534-52-1	2.4E-01	6.0E-05	4.8E-06	4.4E-02	4.6E-02	2.2E-05	1.1E-07
SVOC	1,3-Dinitrobenzene	99-65-0	2.4E+00	6.6E-05	2.6E-06	4.0E-01	4.1E-01	6.3E-05	1.6E-07
SVOC	2,4-Dinitrophenol	51-28-5	2.4E-01	7.8E-05	2.3E-06	5.2E-02	5.7E-02	2.6E-05	5.9E-08
SVOC	2,4-Dinitrotoluene	121-14-2	1.8E+00	6.1E-05	1.3E-06	3.0E-01	3.2E-01	5.9E-05	7.6E-08
SVOC	2,6-Dinitrotoluene	606-20-2	2.8E-01	6.3E-05	1.1E-05	4.8E-02	5.0E-02	2.4E-05	2.6E-07
SVOC	Di-n-octylphthalate	117-84-0	1.3E-01	3.1E-05	7.1E-04	2.1E-02	1.9E-02	1.1E-05	7.7E-06
SVOC	Diphenylamine	122-39-4	5.9E-01	5.4E-05	5.6E-06	9.9E-02	1.0E-01	3.7E-05	2.1E-07
SVOC	Disulfoton	298-04-4	6.9E-01	6.9E-05	4.5E-05	1.1E-01	1.1E-01	3.9E-05	1.7E-06
SVOC	Ethylmethanesulfonate	62-50-0	6.9E-01	6.9E-05	6.0E-05	1.1E-01	1.1E-01	3.9E-05	2.3E-06
SVOC	Famphur	52-85-7	1.7E-01	4.1E-05	1.8E-07	1.2E-01	1.3E-01	4.3E-05	7.7E-09
SVOC	Fluoranthene	206-44-0	2.6E-01	5.5E-05	2.1E-04	4.3E-02	4.1E-02	2.0E-05	4.3E-06
SVOC	Fluorene	86-73-7	3.1E-01	6.8E-05	1.0E-03	5.1E-02	4.4E-02	2.2E-05	2.3E-05
SVOC	Hexachlorobenzene	118-74-1	4.7E-01	5.1E-05	1.7E-02	7.6E-02	2.8E-02	1.5E-05	2.6E-04
SVOC	Hexachlorobutadiene	87-68-3	4.8E-01	5.3E-05	1.6E-01	7.9E-02	6.8E-03	4.3E-06	7.0E-04
SVOC	Hexachlorocyclopentadiene	77-47-4	1.4E-01	6.2E-05	5.0E-01	2.3E-02	2.5E-03	1.6E-06	8.0E-04
SVOC	Hexachloroethane	67-72-1	2.2E-02	5.9E-05	8.3E-02	3.5E-03	2.3E-03	1.5E-06	1.2E-04
SVOC	Hexachloropropene	1888-71-7			5.3E-02				
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	1.6E-01	4.9E-05	1.2E-05	2.8E-02	2.9E-02	1.6E-05	1.9E-07
SVOC	Isophorone	78-59-1	5.4E-01	5.8E-05	1.3E-04	8.8E-02	8.3E-02	3.3E-05	4.3E-06
SVOC	Isosafrole (total)	120-58-1	3.8E-01	6.6E-05	3.7E-11	7.2E+02	8.4E+02	4.3E-03	1.6E-10
SVOC	Methapyrilene	91-80-5	2.0E-01	5.1E-05	3.1E-06	3.9E-02	4.2E-02	2.1E-05	6.4E-08
SVOC	3-Methylcholanthrene	56-49-5	6.9E-01	6.9E-05	1.1E-05	1.1E-01	1.2E-01	4.0E-05	4.2E-07
SVOC	Methylmethanesulfonate	66-27-3	6.7E-01	8.9E-05	8.0E-09	4.6E+00	5.3E+00	8.5E-05	6.7E-10
SVOC	2-Methylnaphthalene	91-57-6	4.5E-01	6.7E-05	1.3E-02	7.3E-02	3.4E-02	1.8E-05	2.4E-04
SVOC	Methylphenol (total)	1319-77-3	6.4E-01	8.6E-05	8.9E-06	1.1E-01	1.1E-01	3.9E-05	3.5E-07
SVOC	Naphthalene	91-20-3	5.1E-01	6.5E-05	9.6E-03	8.3E-02	4.1E-02	2.0E-05	2.0E-04
SVOC	1,4-Naphthoquinone	130-15-4	4.5E-01	7.8E-05	2.6E-04	7.3E-02	6.8E-02	2.9E-05	7.6E-06
SVOC	1-Naphthylamine	134-32-7	4.8E-01	7.2E-05	1.4E-09	2.0E+01	2.4E+01	1.6E-04	2.3E-10
SVOC	2-Naphthylamine	91-59-8	6.9E-01	6.9E-05	6.8E-06	1.2E-01	1.2E-01	4.0E-05	2.7E-07
SVOC	2-Nitroaniline	88-74-4	6.3E-01	6.9E-05	1.8E-06	1.2E-01	1.3E-01	4.1E-05	7.4E-08
SVOC	3-Nitroaniline	99-09-2	5.7E-01	7.2E-05	1.6E-06	1.1E-01	1.2E-01	4.0E-05	6.5E-08
SVOC	4-Nitroaniline	100-01-6	5.0E-01	7.4E-05	2.3E-08	1.4E+00	1.6E+00	7.7E-05	1.8E-09

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Groundwater
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^{T} (m^2/day)	α_∞	C_{bldg} (L-water/m^3)
SVOC	Nitrobenzene	98-95-3	6.6E-01	7.4E-05	4.7E-04	1.1E-01	9.4E-02	3.5E-05	1.7E-05
SVOC	2-Nitrophenol	88-75-5	4.7E-01	6.8E-05	1.1E-04	7.6E-02	7.3E-02	3.1E-05	3.2E-06
SVOC	4-Nitrophenol	100-02-7	5.4E-01	8.3E-05	4.7E-09	7.2E+00	8.3E+00	9.5E-05	4.4E-10
SVOC	4-Nitroquinoline-1-oxide	56-57-5			3.1E-13				
SVOC	N-Nitrosodi-n-butylamine	924-16-3	6.9E-01	6.9E-05	3.6E-03	1.1E-01	7.0E-02	3.0E-05	1.1E-04
SVOC	N-Nitrosodiethylamine	55-18-5	6.9E-01	6.9E-05	4.1E-05	1.1E-01	1.1E-01	3.9E-05	1.6E-06
SVOC	N-Nitrosodimethylamine	62-75-9	6.9E-01	6.9E-05	1.3E-05	1.1E-01	1.2E-01	4.0E-05	5.4E-07
SVOC	N-Nitrosodiphenylamine	86-30-6	2.7E-01	5.5E-05	1.2E-04	4.4E-02	4.3E-02	2.1E-05	2.4E-06
SVOC	N-Nitroso-di-n-propylamine	621-64-7	4.7E-01	7.1E-05	6.0E-05	7.7E-02	7.6E-02	3.1E-05	1.9E-06
SVOC	N-Nitrosomethylethylamine	10595-95-6	6.9E-01	6.9E-05	1.0E-05	1.2E-01	1.2E-01	4.0E-05	4.0E-07
SVOC	N-Nitrosopiperidine	100-75-4	6.9E-01	6.9E-05	3.1E-06	1.2E-01	1.3E-01	4.2E-05	1.3E-07
SVOC	N-Nitrosopyrrolidine	930-55-2	6.9E-01	6.9E-05	1.3E-07	3.2E-01	3.6E-01	6.1E-05	8.3E-09
SVOC	5-Nitro-o-toluidine	99-55-8	4.3E-01	7.0E-05	2.0E-07	2.1E-01	2.4E-01	5.4E-05	1.1E-08
SVOC	N-Nitrosomorpholine	59-89-2	5.1E-01	8.6E-05	4.7E-07	1.6E-01	1.7E-01	4.8E-05	2.3E-08
SVOC	2,2'-oxybis(1-Chloropropane)	108-60-1	5.2E-01	5.5E-05	1.3E-03	8.5E-02	6.6E-02	2.8E-05	3.7E-05
SVOC	Pentachlorobenzene	608-93-5	5.8E-01	5.4E-05	8.0E-03	9.4E-02	4.5E-02	2.2E-05	1.7E-04
SVOC	Pentachloronitrobenzene	82-68-8	6.9E-01	6.9E-05	4.3E-03	1.1E-01	6.7E-02	2.9E-05	1.2E-04
SVOC	Pentachlorophenol	87-86-5	4.8E-01	5.3E-05	2.8E-07	1.5E-01	1.7E-01	4.8E-05	1.3E-08
SVOC	Phenacetin	62-44-2	4.9E-01	5.9E-05	2.4E-09	9.9E+00	1.1E+01	1.1E-04	2.6E-10
SVOC	Phenanthrene	85-01-8	3.2E-01	6.5E-05	2.6E-04	5.3E-02	5.0E-02	2.3E-05	6.2E-06
SVOC	Phenol	108-95-2	7.1E-01	7.9E-05	7.7E-06	1.2E-01	1.2E-01	4.1E-05	3.2E-07
SVOC	p-Phenylene diamine	106-50-3	6.6E-01	8.6E-05	8.7E-09	4.1E+00	4.7E+00	8.3E-05	7.2E-10
SVOC	Phorate	298-02-2	1.9E-01	4.7E-05	4.9E-06	3.4E-02	3.6E-02	1.9E-05	9.1E-08
SVOC	2-Picoline	109-06-8	6.9E-01	8.3E-05	1.1E-04	1.1E-01	1.1E-01	3.8E-05	4.3E-06
SVOC	Pronamide	23950-58-5	6.9E-01	6.9E-05	6.0E-05	1.1E-01	1.1E-01	3.9E-05	2.3E-06
SVOC	Pyrene	129-00-0	2.4E-01	6.3E-05	1.4E-04	3.8E-02	3.7E-02	1.9E-05	2.6E-06
SVOC	Pyridine	110-86-1	7.9E-01	6.6E-05	1.0E-04	1.3E-01	1.2E-01	4.1E-05	4.1E-06
SVOC	Safrole (total)	94-59-7	6.9E-01	6.9E-05	2.1E-04	1.1E-01	1.0E-01	3.7E-05	7.8E-06
SVOC	Sulfotepp	3689-24-5	6.9E-01	6.9E-05	3.2E-05	1.1E-01	1.1E-01	3.9E-05	1.3E-06
SVOC	1,2,4,5-Tetrachlorobenzene	95-94-3	6.9E-01	6.9E-05	2.9E-02	1.1E-01	3.1E-02	1.6E-05	4.7E-04
SVOC	2,3,4,6-Tetrachlorophenol	58-90-2	6.9E-01	6.9E-05	4.9E-05	1.1E-01	1.1E-01	3.9E-05	1.9E-06
SVOC	Thionazin	297-97-2			9.7E-06				
SVOC	o-Toluidine	95-53-4	6.9E-01	6.9E-05	3.1E-05	1.1E-01	1.1E-01	3.9E-05	1.2E-06

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Groundwater
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	C_{bldg} (L-water/m^3)
SVOC	2,4,5-Trichlorophenol	95-95-4	2.5E-01	6.1E-05	7.9E-05	4.1E-02	4.1E-02	2.0E-05	1.6E-06
SVOC	2,4,6-Trichlorophenol	88-06-2	2.7E-01	5.4E-05	1.3E-04	4.5E-02	4.3E-02	2.1E-05	2.8E-06
SVOC	O,O,O-Triethyl phosphorothioate	126-68-1							
SVOC	1,3,5-Trinitrobenzene	99-35-4	2.1E-01	5.3E-05	1.8E-07	1.5E-01	1.7E-01	4.8E-05	8.7E-09
INORG	Aluminum	7429-90-5							
INORG	Antimony	7440-36-0							
INORG	Arsenic	7440-38-2							
INORG	Barium	7440-39-3							
INORG	Beryllium	7440-41-7							
INORG	Cadmium	7440-43-9							
INORG	Chromium (total)	7440-47-3							
INORG	Chromium III	16065-83-1							
INORG	Chromium VI	18540-29-9							
INORG	Cobalt	7440-48-4							
INORG	Copper	7440-50-8							
INORG	Iron	7439-89-6							
INORG	Manganese	7439-96-5							
INORG	Mercury	7439-97-6	2.7E-01	5.4E-05	1.9E-01	4.3E-02	5.5E-03	3.5E-06	6.5E-04
INORG	Nickel	7440-02-0							
INORG	Selenium	7782-49-2							
INORG	Silver	7440-22-4							
INORG	Thallium	7440-28-0							
INORG	Vanadium	7440-62-2							
INORG	Zinc	7440-66-6							
Notes:	**Crack Soil and Building Characteristics**								
	SCS Soil texture class			Sand					
	Bulk density	kg/L	ρ_b	1.66					
	Total porosity	L/L-soil	θ_T	0.375					
	Water-filled porosity	L/L-soil	θ_w	0.0531					
	Air-filled porosity	L/L-soil	θ_a	0.322					
	Residual saturation	L/L-soil	θ_r	0.053					

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Groundwater
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	C_{bldg} (L-water/m^3)
	Hydraulic conductivity	cm/s	**K**	7.4E-03					
	Dynamic viscosity of water	g/cm-s	μ_w	0.01307					
	Density of water	g/cm^3	ρ_w	1.0					
	Gravitational acceleration	cm/s^2	**g**	980.7					
	Intrinsic permeability	cm^2	**k**	9.9E-08					
	Relative saturation	unitless	S_e	0.000					
	van Genuchten N	unitless	**N**	3.177					
	van Genuchten M	unitless	**M**	0.685					
	Relative air permeability	unitless	k_{rg}	1.000					
	Permeability to vapor	cm^2	k_v	9.91E-08					
	Distance from building foundation to source	m	L_T	12.96					
	Bldg foundation thickness	m	L_{crack}	0.15					
	Bldg foundation length	m		19.29					
	Bldg foundation width	m		19.29					
	Bldg occupied height	m		2.44					
	Bldg occupied volume	m^3		907.93					
	Occupied depth below ground	m		0.00					
	Bldg area for vapor intrusion	m^2	A_B	372.1					
	Ratio of A_{crack} to A_B		η	1E-04					
	Area of cracks	m^2	A_{crack}	3.86E-02					
	Air exchange rate	$hour^{-1}$	**ach**	2.0					
	Building ventilation rate	m^3/day	Q_{bldg}	4.36E+04					
	Pressure difference between outdoors-indoors	kg/m-s^2	ΔP	1.0					
	Viscosity of air	kg/m-s	μ_a	1.8E-05					
	Crack length (bldg perimeter)	m	X_{crack}	77.16					
	Crack depth below ground	m	Z_{crack}	0.15					
	Crack radius	m	r_{crack}	5E-04					
	Soil gas flow rate into bldg	m^3/day	Q_{soil}	3.61E+00					

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Soil
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	K_{oc} (L/kg)	K_d (L/kg)	$C_{s, vap}$ (kg-soil/m^3)	α_{ML}	α	C_{bldg} (kg-soil/m^3)
VOC	Acetone	67-64-1	1.1E+00	9.8E-05	1.1E-03	1.7E-01	1.7E-01	8.2E-05	5.8E-01	1.2E-03	3.2E+01	6.3E-04	8.2E-05	2.6E-03
VOC	Acetonitrile	75-05-8	1.1E+00	1.5E-04	1.1E-03	1.8E-01	1.8E-01	8.2E-05	6.4E-01	1.3E-03	3.4E+01	5.9E-04	8.2E-05	2.8E-03
VOC	Acrolein	107-02-8	9.5E-01	1.0E-04	4.1E-03	1.5E-01	1.5E-01	8.2E-05	1.0E+00	2.0E-03	1.2E+02	1.7E-04	8.2E-05	9.6E-03
VOC	Acrylonitrile	107-13-1	1.0E+00	1.1E-04	3.3E-03	1.7E-01	1.7E-01	8.2E-05	2.2E-01	4.5E-04	1.0E+02	2.0E-04	8.2E-05	8.2E-03
VOC	Benzene	71-43-2	7.6E-01	8.5E-05	1.5E-01	1.2E-01	1.2E-01	8.2E-05	5.8E+01	1.2E-01	8.3E+02	2.4E-05	2.4E-05	2.0E-02
VOC	Bromodichloromethane	75-27-4	2.6E-01	9.2E-05	4.1E-02	4.2E-02	4.2E-02	8.0E-05	5.5E+01	1.1E-01	2.7E+02	7.4E-05	7.4E-05	2.0E-02
VOC	Bromoform	75-25-2	1.3E-01	8.9E-05	1.2E-02	2.1E-02	2.1E-02	7.7E-05	8.7E+01	1.7E-01	5.8E+01	3.5E-04	7.7E-05	4.5E-03
VOC	Bromomethane	74-83-9	6.3E-01	1.0E-04	1.9E-01	1.0E-01	1.0E-01	8.2E-05	1.0E+01	2.1E-02	2.1E+03	9.5E-06	9.5E-06	2.0E-02
VOC	2-Butanone	78-93-3	7.0E-01	8.5E-05	1.8E-03	1.1E-01	1.1E-01	8.2E-05	2.0E+00	4.0E-03	5.0E+01	4.0E-04	8.2E-05	4.1E-03
VOC	Carbon Disulfide	75-15-0	9.0E-01	8.6E-05	8.7E-01	1.5E-01	1.5E-01	8.2E-05	4.6E+01	9.2E-02	3.0E+03	6.8E-06	6.8E-06	2.0E-02
VOC	Carbon Tetrachloride	56-23-5	6.7E-01	7.6E-05	8.2E-01	1.1E-01	1.1E-01	8.2E-05	1.7E+02	3.5E-01	1.5E+03	1.3E-05	1.3E-05	2.0E-02
VOC	2-Chloro-1,3-butadiene	126-99-8	8.6E-01	8.6E-05	1.0E+00	1.4E-01	1.4E-01	8.2E-05	3.4E+00	6.8E-03	4.3E+03	4.7E-06	4.7E-06	2.0E-02
VOC	3-Chloro-1-propene	107-05-1	6.9E-01	6.9E-05	2.9E-01	1.1E-01	1.1E-01	8.2E-05	6.9E+00	1.4E-02	2.8E+03	7.1E-06	7.1E-06	2.0E-02
VOC	Chlorobenzene	108-90-7	6.3E-01	7.5E-05	8.9E-02	1.0E-01	1.0E-01	8.2E-05	2.2E+02	4.4E-01	1.8E+02	1.1E-04	8.2E-05	1.5E-02
VOC	Chloroethane	75-00-3	2.3E+00	9.9E-05	3.1E-01	3.8E-01	3.8E-01	8.2E-05	1.6E+01	3.2E-02	2.5E+03	8.1E-06	8.1E-06	2.0E-02
VOC	Chloroform	67-66-3	9.0E-01	8.6E-05	1.0E-01	1.5E-01	1.5E-01	8.2E-05	4.0E+01	7.9E-02	7.6E+02	2.6E-05	2.6E-05	2.0E-02
VOC	Chloromethane	74-87-3	1.1E+00	5.6E-05	3.2E-01	1.8E-01	1.8E-01	8.2E-05	4.0E+01	7.9E-02	1.8E+03	1.1E-05	1.1E-05	2.0E-02
VOC	1,2-Dibromo-3-chloropropane	96-12-8	6.9E-01	6.9E-05	3.9E-03	1.1E-01	1.1E-01	8.2E-05	1.4E+02	2.9E-01	1.2E+01	1.7E-03	8.2E-05	9.8E-04
VOC	Dibromochloromethane	124-48-1	1.7E-01	9.1E-05	2.2E-02	2.8E-02	2.8E-02	7.9E-05	6.3E+01	1.3E-01	1.4E+02	1.5E-04	7.9E-05	1.1E-02
VOC	1,2-Dibromoethane	106-93-4	3.7E-01	7.3E-05	2.3E-02	6.0E-02	6.0E-02	8.1E-05	2.2E+01	4.4E-02	2.8E+02	7.1E-05	7.1E-05	2.0E-02
VOC	Dibromomethane	74-95-3	6.9E-01	6.9E-05	2.8E-02	1.1E-01	1.1E-01	8.2E-05	1.9E+01	3.9E-02	3.6E+02	5.6E-05	5.6E-05	2.0E-02
VOC	trans-1,4-Dichloro-2-butene	110-57-6	5.7E-01	8.0E-05	2.3E-03	9.3E-02	9.3E-02	8.1E-05	5.9E+00	1.2E-02	5.2E+01	3.9E-04	8.1E-05	4.3E-03
VOC	1,2-Dichlorobenzene	95-50-1	6.0E-01	6.8E-05	4.1E-02	9.7E-02	9.7E-02	8.2E-05	6.2E+02	1.2E+00	3.2E+01	6.3E-04	8.2E-05	2.6E-03
VOC	1,3-Dichlorobenzene	541-73-1	6.0E-01	6.8E-05	9.3E-02	9.7E-02	9.7E-02	8.2E-05	5.7E+02	1.1E+00	7.8E+01	2.6E-04	8.2E-05	6.4E-03
VOC	1,4-Dichlorobenzene	106-46-7	6.0E-01	6.8E-05	5.4E-02	9.7E-02	9.7E-02	8.2E-05	6.1E+02	1.2E+00	4.2E+01	4.8E-04	8.2E-05	3.4E-03
VOC	Dichlorodifluoromethane	75-71-8	6.9E-01	6.9E-05	1.1E+01	1.1E-01	1.1E-01	8.2E-05	6.2E+01	1.2E-01	4.8E+03	4.2E-06	4.2E-06	2.0E-02
VOC	1,1-Dichloroethane	75-34-3	6.4E-01	9.1E-05	1.5E-01	1.0E-01	1.0E-01	8.2E-05	3.1E+01	6.3E-02	1.2E+03	1.6E-05	1.6E-05	2.0E-02
VOC	1,2-Dichloroethane	107-06-2	9.0E-01	8.6E-05	2.5E-02	1.5E-01	1.5E-01	8.2E-05	1.7E+01	3.5E-02	3.5E+02	5.7E-05	5.7E-05	2.0E-02
VOC	1,1-Dichloroethene	75-35-4	7.8E-01	9.0E-05	7.6E-01	1.3E-01	1.3E-01	8.2E-05	5.8E+01	1.2E-01	2.6E+03	7.8E-06	7.8E-06	2.0E-02
VOC	trans-1,2-Dichloroethene	156-60-5	6.1E-01	1.0E-04	2.6E-01	9.9E-02	9.9E-02	8.2E-05	5.2E+01	1.0E-01	1.4E+03	1.4E-05	1.4E-05	2.0E-02
VOC	1,2-Dichloropropane	78-87-5	6.8E-01	7.5E-05	7.2E-02	1.1E-01	1.1E-01	8.2E-05	4.3E+01	8.7E-02	5.4E+02	3.7E-05	3.7E-05	2.0E-02
VOC	1,3-Dichloropropene (total)	542-75-6	5.4E-01	8.6E-05	4.4E-01	8.8E-02	8.8E-02	8.1E-05	4.6E+01	9.2E-02	2.1E+03	9.5E-06	9.5E-06	2.0E-02
VOC	1,4-Dioxane	123-91-1	2.0E+00	8.6E-05	1.3E-04	3.2E-01	3.2E-01	8.2E-05	5.6E-01	1.1E-03	3.8E+00	5.3E-03	8.2E-05	3.1E-04
VOC	Ethyl Benzene	100-41-4	6.5E-01	6.7E-05	1.8E-01	1.1E-01	1.1E-01	8.2E-05	3.7E+02	7.3E-01	2.3E+02	8.7E-05	8.2E-05	1.9E-02
VOC	Ethyl Methacrylate	97-63-2	6.9E-01	6.9E-05	2.4E-02	1.1E-01	1.1E-01	8.2E-05	4.1E+01	8.2E-02	2.0E+02	1.0E-04	8.2E-05	1.6E-02
VOC	2-Hexanone	591-78-6	7.4E-01	7.6E-05	2.4E-03	1.2E-01	1.2E-01	8.2E-05	1.5E+01	3.0E-02	3.9E+01	5.1E-04	8.2E-05	3.2E-03
VOC	Iodomethane	74-88-4	4.5E-01	6.7E-05	1.4E-01	7.4E-02	7.4E-02	8.1E-05	2.6E+01	5.2E-02	1.3E+03	1.6E-05	1.6E-05	2.0E-02
VOC	Isobutyl Alcohol	78-83-1	6.9E-01	6.9E-05	3.3E-04	1.1E-01	1.1E-01	8.2E-05	5.4E+00	1.1E-02	7.7E+00	2.6E-03	8.2E-05	6.3E-04
VOC	Methacrylonitrile	126-98-7	6.9E-01	6.9E-05	8.0E-03	1.1E-01	1.1E-01	8.2E-05	3.2E+00	6.4E-03	2.0E+02	1.0E-04	8.2E-05	1.6E-02
VOC	4-Methyl-2-pentanone	108-10-1	6.5E-01	6.7E-05	4.3E-03	1.1E-01	1.1E-01	8.2E-05	1.0E+01	2.1E-02	8.0E+01	2.5E-04	8.2E-05	6.5E-03
VOC	Methylene Chloride	75-09-2	8.7E-01	1.0E-04	6.2E-02	1.4E-01	1.4E-01	8.2E-05	1.2E+01	2.3E-02	9.2E+02	2.2E-05	2.2E-05	2.0E-02
VOC	Methylmethacrylate	80-62-6	6.7E-01	7.4E-05	1.0E-02	1.1E-01	1.1E-01	8.2E-05	1.4E+01	2.7E-02	1.7E+02	1.2E-04	8.2E-05	1.4E-02
VOC	Pentachloroethane	76-01-7	5.7E-01	6.3E-05	5.1E-02	9.3E-02	9.3E-02	8.1E-05	1.7E+02	3.4E-01	1.3E+02	1.5E-04	8.1E-05	1.1E-02
VOC	Propionitrile	107-12-0	1.1E+00	1.2E-04	1.5E-03	1.7E-01	1.7E-01	8.2E-05	1.3E+00	2.6E-03	4.4E+01	4.5E-04	8.2E-05	3.6E-03
VOC	Styrene	100-42-5	6.1E-01	6.9E-05	6.4E-02	1.0E-01	1.0E-01	8.2E-05	7.8E+02	1.6E+00	4.0E+01	5.1E-04	8.2E-05	3.2E-03
VOC	1,1,1,2-Tetrachloroethane	630-20-6	6.1E-01	6.8E-05	7.2E-02	1.0E-01	1.0E-01	8.2E-05	3.1E+02	6.1E-01	1.1E+02	1.8E-04	8.2E-05	8.9E-03
VOC	1,1,2,2-Tetrachloroethane	79-34-5	6.1E-01	6.8E-05	7.9E-03	1.0E-01	1.0E-01	8.2E-05	9.4E+01	1.9E-01	3.6E+01	5.6E-04	8.2E-05	2.9E-03

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Soil
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	K_{oc} (L/kg)	K_d (L/kg)	$C_{s,\ vap}$ (kg-soil/m^3)	α_{ML}	α	C_{bldg} (kg-soil/m^3)
VOC	Tetrachloroethene	127-18-4	6.2E-01	7.1E-05	4.5E-01	1.0E-01	1.0E-01	8.2E-05	1.6E+02	3.1E-01	1.0E+03	1.9E-05	1.9E-05	2.0E-02
VOC	Toluene	108-88-3	7.5E-01	7.4E-05	1.7E-01	1.2E-01	1.2E-01	8.2E-05	1.8E+02	3.6E-01	3.9E+02	5.2E-05	5.2E-05	2.0E-02
VOC	1,2,4-Trichlorobenzene	120-82-1	2.6E-01	7.1E-05	2.8E-02	4.2E-02	4.2E-02	8.0E-05	1.8E+03	3.6E+00	7.7E+00	2.6E-03	8.0E-05	6.1E-04
VOC	1,1,1-Trichloroethane	71-55-6	6.7E-01	7.6E-05	4.6E-01	1.1E-01	1.1E-01	8.2E-05	1.1E+02	2.2E-01	1.3E+03	1.5E-05	1.5E-05	2.0E-02
VOC	1,1,2-Trichloroethane	79-00-5	6.7E-01	7.6E-05	2.2E-02	1.1E-01	1.1E-01	8.2E-05	5.0E+01	1.0E-01	1.6E+02	1.2E-04	8.2E-05	1.3E-02
VOC	Trichloroethene	79-01-6	6.8E-01	7.9E-05	2.7E-01	1.1E-01	1.1E-01	8.2E-05	1.7E+02	3.4E-01	6.3E+02	3.2E-05	3.2E-05	2.0E-02
VOC	Trichlorofluoromethane	75-69-4	7.5E-01	8.4E-05	3.4E+00	1.2E-01	1.2E-01	8.2E-05	1.2E+02	2.4E-01	3.6E+03	5.5E-06	5.5E-06	2.0E-02
VOC	1,2,3-Trichloropropane	96-18-4	6.1E-01	6.8E-05	1.2E-02	1.0E-01	1.0E-01	8.2E-05	4.4E+01	8.9E-02	1.0E+02	2.0E-04	8.2E-05	8.1E-03
VOC	Vinyl Acetate	108-05-4	7.3E-01	7.9E-05	1.3E-02	1.2E-01	1.2E-01	8.2E-05	5.2E+00	1.0E-02	2.9E+02	6.9E-05	6.9E-05	2.0E-02
VOC	Vinyl Chloride	75-01-4	9.2E-01	1.1E-04	8.6E-01	1.5E-01	1.5E-01	8.2E-05	1.8E+01	3.7E-02	3.6E+03	5.5E-06	5.5E-06	2.0E-02
VOC	Xylenes (total)	1330-20-7	6.7E-01	7.6E-05	1.6E-01	1.1E-01	1.1E-01	8.2E-05	3.9E+02	7.7E-01	1.9E+02	1.1E-04	8.2E-05	1.5E-02
SVOC	Acenaphthene	83-32-9	3.6E-01	6.6E-05	2.6E-03	5.9E-02	5.9E-02	8.1E-05	7.1E+03	1.4E+01	1.8E-01	1.1E-01	8.1E-05	1.4E-05
SVOC	Acenaphthylene	208-96-8	3.9E-01	6.0E-05	1.3E-03	6.3E-02	6.3E-02	8.1E-05	7.5E+03	1.5E+01	8.5E-02	2.4E-01	8.1E-05	6.9E-06
SVOC	Acetophenone	98-86-2	6.9E-01	6.9E-05	2.9E-04	1.1E-01	1.1E-01	8.2E-05	3.6E+01	7.2E-02	2.8E+00	7.2E-03	8.2E-05	2.3E-04
SVOC	2-Acetylaminofluorene	53-96-3	2.1E-01	5.2E-05	3.5E-05	3.4E-02	3.4E-02	7.9E-05	1.7E+03	3.4E+00	1.0E-02	2.0E+00	7.9E-05	8.2E-07
SVOC	4-Aminobiphenyl	92-67-1	3.4E-01	6.0E-05	4.4E-09	5.6E+00	5.6E+00	9.0E-05	5.4E+02	1.1E+00	3.9E-06	5.1E+03	9.0E-05	3.5E-10
SVOC	Aniline	62-53-3	6.0E-01	7.2E-05	2.1E-05	1.0E-01	1.0E-01	8.2E-05	7.7E+00	1.5E-02	4.5E-01	4.5E-02	8.2E-05	3.7E-05
SVOC	Anthracene	120-12-7	2.8E-01	6.7E-05	9.5E-04	4.6E-02	4.6E-02	8.0E-05	3.0E+04	5.9E+01	1.6E-02	1.3E+00	8.0E-05	1.3E-06
SVOC	Aramite (total)	140-57-8	1.6E-01	4.0E-05	2.1E-05	2.7E-02	2.7E-02	7.9E-05	4.3E+06	8.5E+03	2.5E-06	8.0E+03	7.9E-05	2.0E-10
SVOC	Benzo(a)anthracene	56-55-3	4.4E-01	7.8E-05	3.7E-05	7.2E-02	7.2E-02	8.1E-05	4.0E+05	8.0E+02	4.6E-05	4.4E+02	8.1E-05	3.8E-09
SVOC	Benzo(a)pyrene	50-32-8	3.7E-01	7.8E-05	9.0E-06	6.4E-02	6.4E-02	8.1E-05	1.0E+06	2.0E+03	4.4E-06	4.5E+03	8.1E-05	3.6E-10
SVOC	Benzo(b)fluoranthene	205-99-2	2.0E-01	4.8E-05	1.1E-03	3.2E-02	3.2E-02	7.9E-05	1.2E+06	2.5E+03	4.2E-04	4.7E+01	7.9E-05	3.4E-08
SVOC	Benzo(g,h,i)perylene	191-24-2	1.9E-01	4.5E-05	1.6E-06	4.2E-02	4.2E-02	8.0E-05	1.3E+07	2.6E+04	6.2E-08	3.2E+05	8.0E-05	5.0E-12
SVOC	Benzo(k)fluoranthene	207-08-9	2.0E-01	4.8E-05	7.1E-06	3.4E-02	3.4E-02	7.9E-05	1.2E+06	2.5E+03	2.9E-06	7.0E+03	7.9E-05	2.3E-10
SVOC	Benzyl Alcohol	100-51-6	6.1E-01	7.8E-05	4.4E-06	1.1E-01	1.1E-01	8.2E-05	1.2E+01	2.4E-02	7.8E-02	2.6E-01	8.2E-05	6.4E-06
SVOC	bis(2-Chloroethoxy)methane	111-91-1	3.8E-01	7.3E-05	1.9E-06	7.7E-02	7.7E-02	8.1E-05	1.7E+01	3.5E-02	2.9E-02	7.0E-01	8.1E-05	2.3E-06
SVOC	bis(2-Chloroethyl) ether	111-44-4	6.0E-01	6.5E-05	3.5E-04	9.7E-02	9.7E-02	8.2E-05	1.5E+01	3.1E-02	5.5E+00	3.7E-03	8.2E-05	4.5E-04
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	3.0E-01	3.2E-05	9.1E-07	6.3E-02	6.3E-02	8.1E-05	1.5E+07	3.0E+04	3.0E-08	6.7E+05	8.1E-05	2.4E-12
SVOC	4-Bromophenyl-phenyl ether	101-55-3	2.3E-01	5.9E-05	1.3E-03	3.7E-02	3.7E-02	8.0E-05	1.6E+04	3.2E+01	4.1E-02	4.9E-01	8.0E-05	3.2E-06
SVOC	2-sec-Butyl-4,6-dinitrophenol	88-85-7	6.9E-01	6.9E-05	5.1E-06	1.2E-01	1.2E-01	8.2E-05	4.2E+03	8.5E+00	6.0E-04	3.3E+01	8.2E-05	4.9E-08
SVOC	Butylbenzylphthalate	85-68-7	1.5E-01	4.2E-05	1.5E-05	2.6E-02	2.6E-02	7.8E-05	5.7E+04	1.1E+02	1.3E-04	1.6E+02	7.8E-05	1.0E-08
SVOC	4-Chloro-3-methylphenol	59-50-7	5.2E-01	8.2E-05	4.5E-06	9.2E-02	9.2E-02	8.1E-05	1.1E+03	2.2E+00	2.0E-03	1.0E+01	8.1E-05	1.6E-07
SVOC	4-Chloroaniline	106-47-8	4.2E-01	8.7E-05	5.9E-06	7.4E-02	7.4E-02	8.1E-05	6.6E+01	1.3E-01	3.6E-02	5.6E-01	8.1E-05	2.9E-06
SVOC	p-Chlorobenzilate	510-15-6	6.9E-01	6.9E-05	8.1E-07	1.5E-01	1.5E-01	8.2E-05	1.9E+04	3.9E+01	2.1E-05	9.6E+02	8.2E-05	1.7E-09
SVOC	2-Chloronaphthalene	91-58-7	4.3E-01	7.6E-05	3.5E-03	6.9E-02	6.9E-02	8.1E-05	1.1E+04	2.2E+01	1.6E-01	1.3E-01	8.1E-05	1.3E-05
SVOC	2-Chlorophenol	95-57-8	4.3E-01	8.2E-05	8.4E-03	7.0E-02	7.0E-02	8.1E-05	3.9E+02	7.8E-01	1.0E+01	2.0E-03	8.1E-05	8.4E-04
SVOC	4-Chlorophenyl-phenyl ether	7005-72-3	2.5E-01	6.6E-05	2.5E-03	4.0E-02	4.0E-02	8.0E-05	1.0E+04	2.1E+01	1.2E-01	1.7E-01	8.0E-05	9.6E-06
SVOC	Chrysene	218-01-9	2.1E-01	5.4E-05	9.6E-04	3.5E-02	3.5E-02	7.9E-05	4.0E+05	8.0E+02	1.2E-03	1.7E+01	7.9E-05	9.5E-08
SVOC	Diallate (total)	2303-16-4	1.8E-01	4.6E-05	4.3E-05	3.0E-02	3.0E-02	7.9E-05	6.0E+07	1.2E+05	3.5E-07	5.7E+04	7.9E-05	2.8E-11
SVOC	Dibenz(a,h)anthracene	53-70-3	1.7E-01	4.5E-05	4.2E-08	4.5E-01	4.5E-01	8.2E-05	3.8E+06	7.5E+03	5.6E-09	3.6E+06	8.2E-05	4.6E-13
SVOC	Dibenzofuran	132-64-9	2.1E-01	5.2E-05	3.9E-05	3.4E-02	3.4E-02	7.9E-05	2.1E+04	4.1E+01	9.4E-04	2.1E+01	7.9E-05	7.5E-08
SVOC	3,3'-Dichlorobenzidine	91-94-1	1.7E-01	5.8E-05	3.2E-08	7.6E-01	7.6E-01	8.3E-05	7.2E+02	1.4E+00	2.1E-05	9.4E+02	8.3E-05	1.8E-09
SVOC	2,4-Dichlorophenol	120-83-2	3.0E-01	7.6E-05	4.4E-05	4.9E-02	4.9E-02	8.0E-05	1.5E+02	2.9E-01	1.3E-01	1.5E-01	8.0E-05	1.1E-05
SVOC	2,6-Dichlorophenol	87-65-0	4.2E-01	7.6E-05	4.5E-04	6.9E-02	6.9E-02	8.1E-05	6.8E+02	1.4E+00	3.2E-01	6.2E-02	8.1E-05	2.6E-05
SVOC	Diethylphthalate	84-66-2	2.2E-01	5.5E-05	6.0E-06	4.0E-02	4.0E-02	8.0E-05	2.9E+02	5.7E-01	9.9E-03	2.0E+00	8.0E-05	7.9E-07
SVOC	Dimethoate	60-51-5	6.9E-01	6.9E-05	6.9E-10	4.0E+01	4.0E+01	2.8E-04	4.6E+02	9.2E-01	7.2E-07	2.8E+04	2.8E-04	2.0E-10
SVOC	p-(Dimethylamino)azobenzene	60-11-7	2.2E-01	5.5E-05	4.5E-09	4.9E+00	4.9E+00	8.8E-05	3.2E+04	6.4E+01	7.1E-08	2.8E+05	8.8E-05	6.2E-12

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Soil
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	K_{oc} (L/kg)	K_d (L/kg)	$C_{s, vap}$ (kg-soil/m^3)	α_{ML}	α	C_{bldg} (kg-soil/m^3)
SVOC	7,12-Dimethylbenz(a)anthracene	57-97-6	6.9E-01	6.9E-05	3.5E-07	1.9E-01	1.9E-01	8.2E-05	5.0E+05	1.0E+03	3.5E-07	5.8E+04	8.2E-05	2.9E-11
SVOC	3,3'-Dimethylbenzidine	119-93-7	6.9E-01	6.9E-05	7.1E-10	3.9E+01	3.9E+01	2.7E-04	2.0E+02	4.0E-01	1.6E-06	1.2E+04	2.7E-04	4.5E-10
SVOC	a,a-Dimethylphenethylamine	122-09-8			1.6E-05				7.4E+01	1.5E-01	9.0E-02	2.2E-01	2.2E-01	2.0E-02
SVOC	2,4-Dimethylphenol	105-67-9	5.0E-01	7.5E-05	3.6E-05	8.3E-02	8.3E-02	8.1E-05	2.1E+02	4.2E-01	8.1E-02	2.5E-01	8.1E-05	6.6E-06
SVOC	Dimethylphthalate	131-11-3	4.9E-01	5.4E-05	1.2E-06	9.8E-02	9.8E-02	8.2E-05	6.9E+01	1.4E-01	7.0E-03	2.9E+00	8.2E-05	5.7E-07
SVOC	Di-n-butylphthalate	84-74-2	3.8E-01	6.8E-05	1.1E-08	2.6E+00	2.6E+00	8.3E-05	3.4E+04	6.8E+01	1.6E-07	1.3E+05	8.3E-05	1.3E-11
SVOC	4,6-Dinitro-2-methylphenol	534-52-1	2.4E-01	6.0E-05	4.8E-06	4.4E-02	4.4E-02	8.0E-05	1.2E+02	2.4E-01	1.7E-02	1.2E+00	8.0E-05	1.4E-06
SVOC	1,3-Dinitrobenzene	99-65-0	2.4E+00	6.6E-05	2.6E-06	4.0E-01	4.0E-01	8.2E-05	2.9E+01	5.8E-02	2.9E-02	7.0E-01	8.2E-05	2.4E-06
SVOC	2,4-Dinitrophenol	51-28-5	2.4E-01	7.8E-05	2.3E-06	5.2E-02	5.2E-02	8.1E-05	1.0E-02	2.0E-05	7.2E-02	2.8E-01	8.1E-05	5.8E-06
SVOC	2,4-Dinitrotoluene	121-14-2	1.8E+00	6.1E-05	1.3E-06	3.0E-01	3.0E-01	8.2E-05	9.5E+01	1.9E-01	5.8E-03	3.5E+00	8.2E-05	4.8E-07
SVOC	2,6-Dinitrotoluene	606-20-2	2.8E-01	6.3E-05	1.1E-05	4.8E-02	4.8E-02	8.0E-05	6.9E+01	1.4E-01	6.5E-02	3.1E-01	8.0E-05	5.2E-06
SVOC	Di-n-octylphthalate	117-84-0	1.3E-01	3.1E-05	7.1E-04	2.1E-02	2.1E-02	7.7E-05	8.4E+07	1.7E+05	4.2E-06	4.8E+03	7.7E-05	3.3E-10
SVOC	Diphenylamine	122-39-4	5.9E-01	5.4E-05	5.6E-06	9.9E-02	9.9E-02	8.2E-05	1.5E+03	2.9E+00	1.9E-03	1.1E+01	8.2E-05	1.5E-07
SVOC	Disulfoton	298-04-4	6.9E-01	6.9E-05	4.5E-05	1.1E-01	1.1E-01	8.2E-05	7.5E+03	1.5E+01	3.0E-03	6.7E+00	8.2E-05	2.4E-07
SVOC	Ethylmethanesulfonate	62-50-0	6.9E-01	6.9E-05	6.0E-05	1.1E-01	1.1E-01	8.2E-05	1.1E+00	2.2E-03	1.8E+00	1.1E-02	8.2E-05	1.4E-04
SVOC	Famphur	52-85-7	1.7E-01	4.1E-05	1.8E-07	1.2E-01	1.2E-01	8.2E-05	1.6E+02	3.1E-01	5.2E-04	3.8E+01	8.2E-05	4.3E-08
SVOC	Fluoranthene	206-44-0	2.6E-01	5.5E-05	2.1E-04	4.3E-02	4.3E-02	8.0E-05	1.1E+05	2.2E+02	9.8E-04	2.1E+01	8.0E-05	7.8E-08
SVOC	Fluorene	86-73-7	3.1E-01	6.8E-05	1.0E-03	5.1E-02	5.1E-02	8.0E-05	1.4E+04	2.8E+01	3.8E-02	5.3E-01	8.0E-05	3.1E-06
SVOC	Hexachlorobenzene	118-74-1	4.7E-01	5.1E-05	1.7E-02	7.6E-02	7.6E-02	8.1E-05	5.5E+04	1.1E+02	1.6E-01	1.3E-01	8.1E-05	1.3E-05
SVOC	Hexachlorobutadiene	87-68-3	4.8E-01	5.3E-05	1.6E-01	7.9E-02	7.9E-02	8.1E-05	5.4E+04	1.1E+02	1.5E+00	1.3E-02	8.1E-05	1.2E-04
SVOC	Hexachlorocyclopentadiene	77-47-4	1.4E-01	6.2E-05	5.0E-01	2.3E-02	2.3E-02	7.8E-05	2.0E+05	4.0E+02	1.3E+00	1.6E-02	7.8E-05	9.8E-05
SVOC	Hexachloroethane	67-72-1	2.2E-02	5.9E-05	8.3E-02	3.5E-03	3.5E-03	5.9E-05	1.8E+03	3.5E+00	2.3E+01	8.6E-04	5.9E-05	1.4E-03
SVOC	Hexachloropropene	1888-71-7			5.3E-02				2.0E+04	4.0E+01	1.3E+00	1.5E-02	1.5E-02	2.0E-02
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	1.6E-01	4.9E-05	1.2E-05	2.8E-02	2.8E-02	7.9E-05	3.4E+06	6.9E+03	1.7E-06	1.2E+04	7.9E-05	1.4E-10
SVOC	Isophorone	78-59-1	5.4E-01	5.8E-05	1.3E-04	8.8E-02	8.8E-02	8.1E-05	4.7E+01	9.4E-02	1.0E+00	1.9E-02	8.1E-05	8.4E-05
SVOC	Isosafrole (total)	120-58-1	3.8E-01	6.6E-05	3.7E-11	7.2E+02	7.2E+02	4.3E-03	4.1E+02	8.2E-01	4.3E-08	4.7E+05	4.3E-03	1.8E-10
SVOC	Methapyrilene	91-80-5	2.0E-01	5.1E-05	3.1E-06	3.9E-02	3.9E-02	8.0E-05	4.9E+02	9.9E-01	3.0E-03	6.7E+00	8.0E-05	2.4E-07
SVOC	3-Methylcholanthrene	56-49-5	6.9E-01	6.9E-05	1.1E-05	1.1E-01	1.1E-01	8.2E-05	9.8E+06	2.0E+04	5.4E-07	3.7E+04	8.2E-05	4.4E-11
SVOC	Methylmethanesulfonate	66-27-3	6.7E-01	8.9E-05	8.0E-09	4.6E+00	4.6E+00	8.7E-05	1.2E-01	2.3E-04	2.5E-04	8.1E+01	8.7E-05	2.1E-08
SVOC	2-Methylnaphthalene	91-57-6	4.5E-01	6.7E-05	1.3E-02	7.3E-02	7.3E-02	8.1E-05	6.2E+03	1.2E+01	1.1E+00	1.9E-02	8.1E-05	8.6E-05
SVOC	Methylphenol (total)	1319-77-3	6.4E-01	8.6E-05	8.9E-06	1.1E-01	1.1E-01	8.2E-05	7.7E+01	1.5E-01	4.8E-02	4.2E-01	8.2E-05	3.9E-06
SVOC	Naphthalene	91-20-3	5.1E-01	6.5E-05	9.6E-03	8.3E-02	8.3E-02	8.1E-05	2.0E+03	4.0E+00	2.4E+00	8.5E-03	8.1E-05	1.9E-04
SVOC	1,4-Naphthoquinone	130-15-4	4.5E-01	7.8E-05	2.6E-04	7.3E-02	7.3E-02	8.1E-05	6.0E+02	1.2E+00	2.1E-01	9.5E-02	8.1E-05	1.7E-05
SVOC	1-Naphthylamine	134-32-7	4.8E-01	7.2E-05	1.4E-09	2.0E+01	2.0E+01	1.7E-04	1.5E+02	3.0E-01	4.2E-06	4.7E+03	1.7E-04	7.1E-10
SVOC	2-Naphthylamine	91-59-8	6.9E-01	6.9E-05	6.8E-06	1.2E-01	1.2E-01	8.2E-05	1.6E+02	3.3E-01	1.9E-02	1.1E+00	8.2E-05	1.5E-06
SVOC	2-Nitroaniline	88-74-4	6.3E-01	6.9E-05	1.8E-06	1.2E-01	1.2E-01	8.2E-05	6.6E+01	1.3E-01	1.1E-02	1.8E+00	8.2E-05	9.0E-07
SVOC	3-Nitroaniline	99-09-2	5.7E-01	7.2E-05	1.6E-06	1.1E-01	1.1E-01	8.2E-05	2.2E+01	4.4E-02	2.1E-02	9.5E-01	8.2E-05	1.7E-06
SVOC	4-Nitroaniline	100-01-6	5.0E-01	7.4E-05	2.3E-08	1.4E+00	1.4E+00	8.3E-05	2.3E+01	4.7E-02	3.0E-04	6.8E+01	8.3E-05	2.5E-08
SVOC	Nitrobenzene	98-95-3	6.6E-01	7.4E-05	4.7E-04	1.1E-01	1.1E-01	8.2E-05	6.4E+01	1.3E-01	2.9E+00	6.9E-03	8.2E-05	2.4E-04
SVOC	2-Nitrophenol	88-75-5	4.7E-01	6.8E-05	1.1E-04	7.6E-02	7.6E-02	8.1E-05	5.8E+01	1.2E-01	7.2E-01	2.8E-02	8.1E-05	5.9E-05
SVOC	4-Nitrophenol	100-02-7	5.4E-01	8.3E-05	4.7E-09	7.2E+00	7.2E+00	9.6E-05	7.5E+01	1.5E-01	2.6E-05	7.9E+02	9.6E-05	2.5E-09
SVOC	4-Nitroquinoline-1-oxide	56-57-5			3.1E-13				1.2E+01	2.4E-02	5.5E-09	3.7E+06	3.7E+06	2.0E-02
SVOC	N-Nitrosodi-n-butylamine	924-16-3	6.9E-01	6.9E-05	3.6E-03	1.1E-01	1.1E-01	8.2E-05	7.7E+01	1.5E-01	1.9E+01	1.1E-03	8.2E-05	1.6E-03
SVOC	N-Nitrosodiethylamine	55-18-5	6.9E-01	6.9E-05	4.1E-05	1.1E-01	1.1E-01	8.2E-05	3.0E+00	5.9E-03	1.1E+00	1.9E-02	8.2E-05	8.8E-05
SVOC	N-Nitrosodimethylamine	62-75-9	6.9E-01	6.9E-05	1.3E-05	1.1E-01	1.1E-01	8.2E-05	3.5E-01	6.9E-04	4.1E-01	4.9E-02	8.2E-05	3.4E-05
SVOC	N-Nitrosodiphenylamine	86-30-6	2.7E-01	5.5E-05	1.2E-04	4.4E-02	4.4E-02	8.0E-05	1.3E+03	2.6E+00	4.4E-02	4.5E-01	8.0E-05	3.6E-06
SVOC	N-Nitroso-di-n-propylamine	621-64-7	4.7E-01	7.1E-05	6.0E-05	7.7E-02	7.7E-02	8.1E-05	2.4E+01	4.8E-02	7.5E-01	2.7E-02	8.1E-05	6.1E-05

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Soil Bway Corporation, Cincinnati, Ohio														
Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	K_{oc} (L/kg)	K_d (L/kg)	$C_{s,\ vap}$ (kg-soil/m^3)	α_{ML}	α	C_{bldg} (kg-soil/m^3)
SVOC	N-Nitrosomethylethylamine	10595-95-6	6.9E-01	6.9E-05	1.0E-05	1.2E-01	1.2E-01	8.2E-05	1.1E+00	2.2E-03	2.9E-01	6.9E-02	8.2E-05	2.4E-05
SVOC	N-Nitrosopiperidine	100-75-4	6.9E-01	6.9E-05	3.1E-06	1.2E-01	1.2E-01	8.2E-05	2.3E+00	4.5E-03	8.6E-02	2.3E-01	8.2E-05	7.1E-06
SVOC	N-Nitrosopyrrolidine	930-55-2	6.9E-01	6.9E-05	1.3E-07	3.2E-01	3.2E-01	8.2E-05	6.5E-01	1.3E-03	4.1E-03	5.0E+00	8.2E-05	3.3E-07
SVOC	5-Nitro-o-toluidine	99-55-8	4.3E-01	7.0E-05	2.0E-07	2.1E-01	2.1E-01	8.2E-05	8.4E+01	1.7E-01	1.0E-03	2.0E+01	8.2E-05	8.2E-08
SVOC	N-Nitrosomorpholine	59-89-2	5.1E-01	8.6E-05	4.7E-07	1.6E-01	1.6E-01	8.2E-05	3.7E-01	7.4E-04	1.4E-02	1.4E+00	8.2E-05	1.2E-06
SVOC	2,2'-oxybis(1-Chloropropane)	108-60-1	5.2E-01	5.5E-05	1.3E-03	8.5E-02	8.5E-02	8.1E-05	2.6E+02	5.1E-01	2.4E+00	8.3E-03	8.1E-05	2.0E-04
SVOC	Pentachlorobenzene	608-93-5	5.8E-01	5.4E-05	8.0E-03	9.4E-02	9.4E-02	8.2E-05	1.5E+04	3.0E+01	2.7E-01	7.5E-02	8.2E-05	2.2E-05
SVOC	Pentachloronitrobenzene	82-68-8	6.9E-01	6.9E-05	4.3E-03	1.1E-01	1.1E-01	8.2E-05	5.7E+03	1.1E+01	3.8E-01	5.3E-02	8.2E-05	3.1E-05
SVOC	Pentachlorophenol	87-86-5	4.8E-01	5.3E-05	2.8E-07	1.5E-01	1.5E-01	8.2E-05	5.9E+02	1.2E+00	2.3E-04	8.9E+01	8.2E-05	1.9E-08
SVOC	Phenacetin	62-44-2	4.9E-01	5.9E-05	2.4E-09	9.9E+00	9.9E+00	1.1E-04	3.6E+01	7.2E-02	2.3E-05	8.7E+02	1.1E-04	2.5E-09
SVOC	Phenanthrene	85-01-8	3.2E-01	6.5E-05	2.6E-04	5.3E-02	5.3E-02	8.1E-05	2.4E+04	4.8E+01	5.4E-03	3.7E+00	8.1E-05	4.4E-07
SVOC	Phenol	108-95-2	7.1E-01	7.9E-05	7.7E-06	1.2E-01	1.2E-01	8.2E-05	2.9E+01	5.8E-02	8.7E-02	2.3E-01	8.2E-05	7.1E-06
SVOC	p-Phenylene diamine	106-50-3	6.6E-01	8.6E-05	8.7E-09	4.1E+00	4.1E+00	8.5E-05	5.6E-01	1.1E-03	2.6E-04	7.7E+01	8.5E-05	2.2E-08
SVOC	Phorate	298-02-2	1.9E-01	4.7E-05	4.9E-06	3.4E-02	3.4E-02	7.9E-05	3.2E+03	6.3E+00	7.7E-04	2.6E+01	7.9E-05	6.1E-08
SVOC	2-Picoline	109-06-8	6.9E-01	8.3E-05	1.1E-04	1.1E-01	1.1E-01	8.2E-05	1.1E+01	2.2E-02	2.1E+00	9.8E-03	8.2E-05	1.7E-04
SVOC	Pronamide	23950-58-5	6.9E-01	6.9E-05	6.0E-05	1.1E-01	1.1E-01	8.2E-05	2.4E+03	4.7E+00	1.3E-02	1.6E+00	8.2E-05	1.0E-06
SVOC	Pyrene	129-00-0	2.4E-01	6.3E-05	1.4E-04	3.8E-02	3.8E-02	8.0E-05	1.1E+05	2.1E+02	6.6E-04	3.0E+01	8.0E-05	5.3E-08
SVOC	Pyridine	110-86-1	7.9E-01	6.6E-05	1.0E-04	1.3E-01	1.3E-01	8.2E-05	4.4E+00	8.7E-03	2.5E+00	8.2E-03	8.2E-05	2.0E-04
SVOC	Safrole (total)	94-59-7	6.9E-01	6.9E-05	2.1E-04	1.1E-01	1.1E-01	8.2E-05	4.1E+02	8.2E-01	2.4E-01	8.2E-02	8.2E-05	2.0E-05
SVOC	Sulfotepp	3689-24-5	6.9E-01	6.9E-05	3.2E-05	1.1E-01	1.1E-01	8.2E-05	5.8E+03	1.2E+01	2.8E-03	7.3E+00	8.2E-05	2.3E-07
SVOC	1,2,4,5-Tetrachlorobenzene	95-94-3	6.9E-01	6.9E-05	2.9E-02	1.1E-01	1.1E-01	8.2E-05	4.5E+03	8.9E+00	3.2E+00	6.2E-03	8.2E-05	2.6E-04
SVOC	2,3,4,6-Tetrachlorophenol	58-90-2	6.9E-01	6.9E-05	4.9E-05	1.1E-01	1.1E-01	8.2E-05	2.8E+02	5.6E-01	8.3E-02	2.4E-01	8.2E-05	6.8E-06
SVOC	Thionazin	297-97-2			9.7E-06				6.7E+01	1.3E-01	5.8E-02	3.5E-01	3.5E-01	2.0E-02
SVOC	o-Toluidine	95-53-4	6.9E-01	6.9E-05	3.1E-05	1.1E-01	1.1E-01	8.2E-05	1.9E+01	3.7E-02	4.4E-01	4.5E-02	8.2E-05	3.6E-05
SVOC	2,4,5-Trichlorophenol	95-95-4	2.5E-01	6.1E-05	7.9E-05	4.1E-02	4.1E-02	8.0E-05	1.6E+03	3.2E+00	2.4E-02	8.3E-01	8.0E-05	1.9E-06
SVOC	2,4,6-Trichlorophenol	88-06-2	2.7E-01	5.4E-05	1.3E-04	4.5E-02	4.5E-02	8.0E-05	3.8E+02	7.6E-01	1.6E-01	1.2E-01	8.0E-05	1.3E-05
SVOC	O,O,O-Triethyl phosphorothioate	126-68-1												
SVOC	1,3,5-Trinitrobenzene	99-35-4	2.1E-01	5.3E-05	1.8E-07	1.5E-01	1.5E-01	8.2E-05	1.4E+01	2.9E-02	3.0E-03	6.8E+00	8.2E-05	2.4E-07
INORG	Aluminum	7429-90-5								1.5E+03				
INORG	Antimony	7440-36-0								4.5E+01				
INORG	Arsenic	7440-38-2								2.9E+01				
INORG	Barium	7440-39-3								4.1E+01				
INORG	Beryllium	7440-41-7								7.9E+02				
INORG	Cadmium	7440-43-9								7.5E+01				
INORG	Chromium (total)	7440-47-3								1.9E+01				
INORG	Chromium III	16065-83-1								1.8E+06				
INORG	Chromium VI	18540-29-9								1.9E+01				
INORG	Cobalt	7440-48-4								4.5E+01				
INORG	Copper	7440-50-8								3.5E+01				
INORG	Iron	7439-89-6								2.5E+01				
INORG	Manganese	7439-96-5								6.5E+01				
INORG	Mercury	7439-97-6	2.7E-01	5.4E-05	1.9E-01	4.3E-02	4.3E-02	8.0E-05		1.0E+03	1.9E-01	1.1E-01	8.0E-05	1.5E-05
INORG	Nickel	7440-02-0								6.5E+01				
INORG	Selenium	7782-49-2								5.0E+00				
INORG	Silver	7440-22-4								8.3E+00				
INORG	Thallium	7440-28-0								7.1E+01				
INORG	Vanadium	7440-62-2								1.0E+03				

Attachment A2: Normalized Indoor Air Concentration in a Commercial/Industrial Slab-on-Grade Building due to Vapor Intrusion from Soil
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	D_{air} (m^2/day)	D_{water} (m^2/day)	H (unitless)	D_{crack} (m^2/day)	D_{eff}^T (m^2/day)	α_∞	K_{oc} (L/kg)	K_d (L/kg)	$C_{s, vap}$ (kg-soil/m^3)	α_{ML}	α	C_{bldg} (kg-soil/m^3)
INORG	Zinc	7440-66-6								6.2E+01				
Notes:	**Soil and Building Characteristics**			**Crack**	**Vadose**									
	SCS Soil texture class			Sand	Sand									
	Bulk density	kg/L	ρ_b	1.66	1.66									
	Total porosity	L/L-soil	θ_T	0.375	0.375									
	Water-filled porosity	L/L-soil	θ_w	0.0531	0.0531									
	Air-filled porosity	L/L-soil	θ_a	0.322	0.322									
	Organic carbon fraction	unitless	f_{oc}		0.002									
	Residual saturation	L/L-soil	θ_r	0.053	0.053									
	Hydraulic conductivity	cm/s	**K**	7.4E-03										
	Dynamic viscosity of water	g/cm-s	μ_w	0.01307										
	Density of water	g/cm^3	ρ_w	1.0										
	Gravitational acceleration	cm/s^2	**g**	980.7										
	Intrinsic permeability	cm^2	**k**	9.9E-08										
	Relative saturation	unitless	S_e	0.000										
	van Genuchten N	unitless	**N**	3.18										
	van Genuchten M	unitless	**M**	0.685										
	Relative air permeability	unitless	k_{rg}	1.000										
	Permeability to vapor	cm^2	k_v	9.9E-08										
	Distance from building foundation to source	m	L_T	0.15										
	Bldg foundation thickness	m	L_{crack}	0.15										
	Bldg foundation length	m		19.29										
	Bldg foundation width	m		19.29										
	Bldg occupied height	m		2.44										
	Bldg occupied volume	m^3		907.93										
	Occupied depth below ground	m												
	Bldg area for vapor intrusion	m^2	A_B	372.1										
	Ratio of A_{crack} to A_B		η	1E-04										
	Area of cracks	m^2	A_{crack}	3.86E-02										
	Air exchange rate	$hour^{-1}$	**ach**	2.0										
	Building ventilation rate	m^3/day	Q_{bldg}	4.36E+04										
	Pressure difference between outdoors-indoors	kg/m-s^2	ΔP	1.0										
	Viscosity of air	kg/m-s	μ_a	1.8E-05										
	Crack length (bldg perimeter)	m	X_{crack}	77.16										
	Crack depth below ground	m	Z_{crack}	0.15										
	Crack radius	m	r_{crack}	5E-04										
	Soil gas flow rate into bldg	m^3/day	Q_{soil}	3.61E+00										
	Averaging period	d	**T**	9.13E+03										
	Maximum depth to saturated zone	m		1.31E+01										
	Contaminant thickness	m	ΔH	13.0										

Attachment A2: Risk-Based Routine Worker Cancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation				Soil Indoor Air Vapor Inhalation			
Chem Group	Chemical	CASRN	Cancer Class	C_{gw} (mg/L)	C_{air} (mg/m^3)	URF (m^3/mg)	GW Cancer Criteria (mg/L)	C_{soil} (mg/kg)	C_{air} (mg/m^3)	URF (m^3/mg)	Soil Cancer Criteria (mg/kg)
VOC	Acetone	67-64-1	ID	1.0E+00	4.6E-05			1.0E+00	2.6E-03		
VOC	Acetonitrile	75-05-8	D	1.0E+00	5.1E-05			1.0E+00	2.8E-03		
VOC	Acrolein	107-02-8	ID	1.0E+00	1.5E-04			1.0E+00	9.6E-03		
VOC	Acrylonitrile	107-13-1	B1	1.0E+00	1.3E-04	6.8E-02	4.7E+00	1.0E+00	8.2E-03	6.8E-02	7.3E-02
VOC	Benzene	71-43-2	A	1.0E+00	1.1E-03	7.8E-03	5.0E+00	1.0E+00	2.0E-02	7.8E-03	2.6E-01
VOC	Bromodichloromethane	75-27-4	B2	1.0E+00	4.2E-04	1.8E-02	5.5E+00	1.0E+00	2.0E-02	1.8E-02	1.1E-01
VOC	Bromoform	75-25-2	B2	1.0E+00	1.1E-04	1.1E-03	3.4E+02	1.0E+00	4.5E-03	1.1E-03	8.3E+00
VOC	Bromomethane	74-83-9	ID	1.0E+00	1.3E-03			1.0E+00	2.0E-02		
VOC	2-Butanone	78-93-3	ID	1.0E+00	6.1E-05			1.0E+00	4.1E-03		
VOC	Carbon Disulfide	75-15-0		1.0E+00	1.6E-03			1.0E+00	2.0E-02		
VOC	Carbon Tetrachloride	56-23-5	B2	1.0E+00	1.3E-03	1.5E-02	2.0E+00	1.0E+00	2.0E-02	1.5E-02	1.4E-01
VOC	2-Chloro-1,3-butadiene	126-99-8		1.0E+00	1.6E-03			1.0E+00	2.0E-02		
VOC	3-Chloro-1-propene	107-05-1	C	1.0E+00	1.0E-03			1.0E+00	2.0E-02		
VOC	Chlorobenzene	108-90-7	D	1.0E+00	8.0E-04			1.0E+00	1.5E-02		
VOC	Chloroethane	75-00-3	LC	1.0E+00	1.7E-03			1.0E+00	2.0E-02		
VOC	Chloroform	67-66-3	B2	1.0E+00	9.8E-04	2.3E-02	1.8E+00	1.0E+00	2.0E-02	2.3E-02	8.8E-02
VOC	Chloromethane	74-87-3	D	1.0E+00	9.4E-04			1.0E+00	2.0E-02		
VOC	1,2-Dibromo-3-chloropropane	96-12-8	LC	1.0E+00	1.1E-04	6.0E+00	6.0E-02	1.0E+00	9.8E-04	6.0E+00	6.9E-03
VOC	Dibromochloromethane	124-48-1	C	1.0E+00	2.2E-04	2.4E-02	7.9E+00	1.0E+00	1.1E-02	2.4E-02	1.6E-01
VOC	1,2-Dibromoethane	106-93-4	LC	1.0E+00	3.2E-04	6.0E-01	2.1E-01	1.0E+00	2.0E-02	6.0E-01	3.4E-03
VOC	Dibromomethane	74-95-3		1.0E+00	4.6E-04			1.0E+00	2.0E-02		
VOC	trans-1,4-Dichloro-2-butene	110-57-6		1.0E+00	6.8E-05			1.0E+00	4.3E-03		
VOC	1,2-Dichlorobenzene	95-50-1	D	1.0E+00	5.3E-04			1.0E+00	2.6E-03		
VOC	1,3-Dichlorobenzene	541-73-1	D	1.0E+00	7.5E-04			1.0E+00	6.4E-03		
VOC	1,4-Dichlorobenzene	106-46-7	C	1.0E+00	6.0E-04	6.3E-03	1.1E+01	1.0E+00	3.4E-03	6.3E-03	1.9E+00
VOC	Dichlorodifluoromethane	75-71-8		1.0E+00	3.9E-03			1.0E+00	2.0E-02		
VOC	1,1-Dichloroethane	75-34-3	SC	1.0E+00	1.1E-03			1.0E+00	2.0E-02		
VOC	1,2-Dichloroethane	107-06-2	B2	1.0E+00	5.2E-04	2.6E-02	3.0E+00	1.0E+00	2.0E-02	2.6E-02	7.8E-02
VOC	1,1-Dichloroethene	75-35-4	C	1.0E+00	1.5E-03			1.0E+00	2.0E-02		
VOC	trans-1,2-Dichloroethene	156-60-5		1.0E+00	1.4E-03			1.0E+00	2.0E-02		
VOC	1,2-Dichloropropane	78-87-5	B2	1.0E+00	7.5E-04			1.0E+00	2.0E-02		
VOC	1,3-Dichloropropene (total)	542-75-6	B2	1.0E+00	1.3E-03	4.0E-03	7.9E+00	1.0E+00	2.0E-02	4.0E-03	5.1E-01
VOC	1,4-Dioxane	123-91-1	B2	1.0E+00	7.3E-06			1.0E+00	3.1E-04		
VOC	Ethyl Benzene	100-41-4	D	1.0E+00	9.1E-04			1.0E+00	1.9E-02		
VOC	Ethyl Methacrylate	97-63-2		1.0E+00	4.2E-04			1.0E+00	1.6E-02		
VOC	2-Hexanone	591-78-6		1.0E+00	8.0E-05			1.0E+00	3.2E-03		
VOC	Iodomethane	74-88-4		1.0E+00	8.0E-04			1.0E+00	2.0E-02		
VOC	Isobutyl Alcohol	78-83-1		1.0E+00	1.2E-05			1.0E+00	6.3E-04		
VOC	Methacrylonitrile	126-98-7		1.0E+00	2.0E-04			1.0E+00	1.6E-02		
VOC	4-Methyl-2-pentanone	108-10-1	ID	1.0E+00	1.2E-04			1.0E+00	6.5E-03		
VOC	Methylene Chloride	75-09-2	B2	1.0E+00	9.0E-04	4.7E-04	9.7E+01	1.0E+00	2.0E-02	4.7E-04	4.3E+00
VOC	Methylmethacrylate	80-62-6	E	1.0E+00	2.4E-04			1.0E+00	1.4E-02		
VOC	Pentachloroethane	76-01-7	LC	1.0E+00	5.6E-04			1.0E+00	1.1E-02		
VOC	Propionitrile	107-12-0		1.0E+00	6.5E-05			1.0E+00	3.6E-03		
VOC	Styrene	100-42-5		1.0E+00	6.6E-04			1.0E+00	3.2E-03		

Attachment A2: Risk-Based Routine Worker Cancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation				Soil Indoor Air Vapor Inhalation			
Chem Group	Chemical	CASRN	Cancer Class	C_{gw} (mg/L)	C_{air} (mg/m^3)	URF (m^3/mg)	GW Cancer Criteria (mg/L)	C_{soil} (mg/kg)	C_{air} (mg/m^3)	URF (m^3/mg)	Soil Cancer Criteria (mg/kg)
VOC	1,1,1,2-Tetrachloroethane	630-20-6	C	1.0E+00	6.9E-04	7.4E-03	8.0E+00	1.0E+00	8.9E-03	7.4E-03	6.2E-01
VOC	1,1,2,2-Tetrachloroethane	79-34-5	C	1.0E+00	1.9E-04	5.8E-02	3.8E+00	1.0E+00	2.9E-03	5.8E-02	2.4E-01
VOC	Tetrachloroethene	127-18-4	C-B2	1.0E+00	1.1E-03	3.1E-03	1.2E+01	1.0E+00	2.0E-02	3.1E-03	6.6E-01
VOC	Toluene	108-88-3	ID	1.0E+00	9.8E-04			1.0E+00	2.0E-02		
VOC	1,2,4-Trichlorobenzene	120-82-1	D	1.0E+00	3.0E-04			1.0E+00	6.1E-04		
VOC	1,1,1-Trichloroethane	71-55-6	ID	1.0E+00	1.2E-03			1.0E+00	2.0E-02		
VOC	1,1,2-Trichloroethane	79-00-5	C	1.0E+00	4.1E-04	1.6E-02	6.2E+00	1.0E+00	1.3E-02	1.6E-02	1.9E-01
VOC	Trichloroethene	79-01-6	C-B2	1.0E+00	1.1E-03	1.7E-03	2.1E+01	1.0E+00	2.0E-02	1.7E-03	1.2E+00
VOC	Trichlorofluoromethane	75-69-4		1.0E+00	2.2E-03			1.0E+00	2.0E-02		
VOC	1,2,3-Trichloropropane	96-18-4	B2	1.0E+00	2.6E-04			1.0E+00	8.1E-03		
VOC	Vinyl Acetate	108-05-4		1.0E+00	3.1E-04			1.0E+00	2.0E-02		
VOC	Vinyl Chloride	75-01-4	A	1.0E+00	1.9E-03	8.8E-03	2.5E+00	1.0E+00	2.0E-02	8.8E-03	2.3E-01
VOC	Xylenes (total)	1330-20-7	ID	1.0E+00	9.6E-04			1.0E+00	1.5E-02		
SVOC	Acenaphthene	83-32-9		1.0E+00	5.6E-05			1.0E+00	1.4E-05		
SVOC	Acenaphthylene	208-96-8	D	1.0E+00	3.1E-05			1.0E+00	6.9E-06		
SVOC	Acetophenone	98-86-2	D	1.0E+00	1.1E-05			1.0E+00	2.3E-04		
SVOC	2-Acetylaminofluorene	53-96-3		1.0E+00	6.2E-07			1.0E+00	8.2E-07		
SVOC	4-Aminobiphenyl	92-67-1		1.0E+00	3.9E-10			1.0E+00	3.5E-10		
SVOC	Aniline	62-53-3	B2	1.0E+00	7.8E-07			1.0E+00	3.7E-05		
SVOC	Anthracene	120-12-7	D	1.0E+00	1.9E-05			1.0E+00	1.3E-06		
SVOC	Aramite (total)	140-57-8	B2	1.0E+00	3.2E-07	7.1E-03	1.8E+04	1.0E+00	2.0E-10	7.1E-03	2.9E+07
SVOC	Benzo(a)anthracene	56-55-3	B2	1.0E+00	1.1E-06	8.9E-02	4.1E+02	1.0E+00	3.8E-09	8.9E-02	1.2E+05
SVOC	Benzo(a)pyrene	50-32-8	B2	1.0E+00	2.6E-07	8.9E-01	1.8E+02	1.0E+00	3.6E-10	8.9E-01	1.3E+05
SVOC	Benzo(b)fluoranthene	205-99-2	B2	1.0E+00	1.6E-05	8.9E-02	2.9E+01	1.0E+00	3.4E-08	8.9E-02	1.4E+04
SVOC	Benzo(g,h,i)perylene	191-24-2	D	1.0E+00	3.5E-08			1.0E+00	5.0E-12		
SVOC	Benzo(k)fluoranthene	207-08-9	B2	1.0E+00	1.3E-07	8.9E-03	3.5E+04	1.0E+00	2.3E-10	8.9E-03	2.0E+07
SVOC	Benzyl Alcohol	100-51-6	ID	1.0E+00	1.7E-07			1.0E+00	6.4E-06		
SVOC	bis(2-Chloroethoxy)methane	111-91-1	D	1.0E+00	6.3E-08			1.0E+00	2.3E-06		
SVOC	bis(2-Chloroethyl) ether	111-44-4	B2	1.0E+00	1.2E-05	3.3E-01	1.1E+01	1.0E+00	4.5E-04	3.3E-01	2.8E-01
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	1.0E+00	2.6E-08	4.0E-03	3.9E+05	1.0E+00	2.4E-12	4.0E-03	4.2E+09
SVOC	4-Bromophenyl-phenyl ether	101-55-3	D	1.0E+00	2.2E-05			1.0E+00	3.2E-06		
SVOC	2-sec-Butyl-4,6-dinitrophenol	88-85-7	D	1.0E+00	2.1E-07			1.0E+00	4.9E-08		
SVOC	Butylbenzylphthalate	85-68-7	C	1.0E+00	2.1E-07	5.4E-04	3.6E+05	1.0E+00	1.0E-08	5.4E-04	7.6E+06
SVOC	4-Chloro-3-methylphenol	59-50-7		1.0E+00	1.6E-07			1.0E+00	1.6E-07		
SVOC	4-Chloroaniline	106-47-8	LC	1.0E+00	1.9E-07	1.5E-02	1.4E+04	1.0E+00	2.9E-06	1.5E-02	9.1E+02
SVOC	p-Chlorobenzilate	510-15-6	B2	1.0E+00	3.8E-08	7.8E-02	1.4E+04	1.0E+00	1.7E-09	7.8E-02	3.0E+05
SVOC	2-Chloronaphthalene	91-58-7		1.0E+00	8.3E-05			1.0E+00	1.3E-05		
SVOC	2-Chlorophenol	95-57-8	ID	1.0E+00	1.7E-04			1.0E+00	8.4E-04		
SVOC	4-Chlorophenyl-phenyl ether	7005-72-3		1.0E+00	4.2E-05			1.0E+00	9.6E-06		
SVOC	Chrysene	218-01-9	B2	1.0E+00	1.6E-05	8.9E-04	2.9E+03	1.0E+00	9.5E-08	8.9E-04	4.8E+05
SVOC	Diallate (total)	2303-16-4	B2	1.0E+00	6.9E-07	1.7E-02	3.4E+03	1.0E+00	2.8E-11	1.7E-02	8.4E+07
SVOC	Dibenz(a,h)anthracene	53-70-3	B2	1.0E+00	2.8E-09	8.9E-01	1.6E+04	1.0E+00	4.6E-13	8.9E-01	1.0E+08
SVOC	Dibenzofuran	132-64-9	D	1.0E+00	6.9E-07			1.0E+00	7.5E-08		
SVOC	3,3'-Dichlorobenzidine	91-94-1	B2	1.0E+00	2.3E-09	1.3E-01	1.4E+05	1.0E+00	1.8E-09	1.3E-01	1.8E+05
SVOC	2,4-Dichlorophenol	120-83-2	ID	1.0E+00	1.0E-06			1.0E+00	1.1E-05		

Attachment A2: Risk-Based Routine Worker Cancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation				Soil Indoor Air Vapor Inhalation			
Chem Group	Chemical	CASRN	Cancer Class	C_{gw} (mg/L)	C_{air} (mg/m^3)	URF (m^3/mg)	GW Cancer Criteria (mg/L)	C_{soil} (mg/kg)	C_{air} (mg/m^3)	URF (m^3/mg)	Soil Cancer Criteria (mg/kg)
SVOC	2,6-Dichlorophenol	87-65-0		1.0E+00	1.2E-05			1.0E+00	2.6E-05		
SVOC	Diethylphthalate	84-66-2	D	1.0E+00	1.2E-07			1.0E+00	7.9E-07		
SVOC	Dimethoate	60-51-5		1.0E+00	1.9E-10			1.0E+00	2.0E-10		
SVOC	p-(Dimethylamino)azobenzene	60-11-7		1.0E+00	3.9E-10			1.0E+00	6.2E-12		
SVOC	7,12-Dimethylbenz(a)anthracene	57-97-6		1.0E+00	1.8E-08			1.0E+00	2.9E-11		
SVOC	3,3'-Dimethylbenzidine	119-93-7	LC	1.0E+00	1.9E-10			1.0E+00	4.5E-10		
SVOC	a,a-Dimethylphenethylamine	122-09-8		1.0E+00				1.0E+00	2.0E-02		
SVOC	2,4-Dimethylphenol	105-67-9	ID	1.0E+00	1.2E-06			1.0E+00	6.6E-06		
SVOC	Dimethylphthalate	131-11-3	D	1.0E+00	4.5E-08			1.0E+00	5.7E-07		
SVOC	Di-n-butylphthalate	84-74-2	D	1.0E+00	8.6E-10			1.0E+00	1.3E-11		
SVOC	4,6-Dinitro-2-methylphenol	534-52-1	ID	1.0E+00	1.1E-07			1.0E+00	1.4E-06		
SVOC	1,3-Dinitrobenzene	99-65-0	D	1.0E+00	1.6E-07			1.0E+00	2.4E-06		
SVOC	2,4-Dinitrophenol	51-28-5	ID	1.0E+00	5.9E-08			1.0E+00	5.8E-06		
SVOC	2,4-Dinitrotoluene	121-14-2	B2	1.0E+00	7.6E-08			1.0E+00	4.8E-07		
SVOC	2,6-Dinitrotoluene	606-20-2	B2	1.0E+00	2.6E-07	1.9E-01	8.2E+02	1.0E+00	5.2E-06	1.9E-01	4.1E+01
SVOC	Di-n-octylphthalate	117-84-0		1.0E+00	7.7E-06			1.0E+00	3.3E-10		
SVOC	Diphenylamine	122-39-4		1.0E+00	2.1E-07			1.0E+00	1.5E-07		
SVOC	Disulfoton	298-04-4		1.0E+00	1.7E-06			1.0E+00	2.4E-07		
SVOC	Ethylmethanesulfonate	62-50-0		1.0E+00	2.3E-06			1.0E+00	1.4E-04		
SVOC	Famphur	52-85-7		1.0E+00	7.7E-09			1.0E+00	4.3E-08		
SVOC	Fluoranthene	206-44-0	D	1.0E+00	4.3E-06			1.0E+00	7.8E-08		
SVOC	Fluorene	86-73-7	D	1.0E+00	2.3E-05			1.0E+00	3.1E-06		
SVOC	Hexachlorobenzene	118-74-1	B2	1.0E+00	2.6E-04	4.6E-01	3.4E-01	1.0E+00	1.3E-05	4.6E-01	7.0E+00
SVOC	Hexachlorobutadiene	87-68-3	C	1.0E+00	7.0E-04	2.2E-02	2.6E+00	1.0E+00	1.2E-04	2.2E-02	1.5E+01
SVOC	Hexachlorocyclopentadiene	77-47-4	E	1.0E+00	8.0E-04			1.0E+00	9.8E-05		
SVOC	Hexachloroethane	67-72-1	C	1.0E+00	1.2E-04	4.0E-03	8.3E+01	1.0E+00	1.4E-03	4.0E-03	7.5E+00
SVOC	Hexachloropropene	1888-71-7		1.0E+00				1.0E+00	2.0E-02		
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	1.0E+00	1.9E-07	8.9E-02	2.4E+03	1.0E+00	1.4E-10	8.9E-02	3.4E+06
SVOC	Isophorone	78-59-1	C	1.0E+00	4.3E-06			1.0E+00	8.4E-05		
SVOC	Isosafrole (total)	120-58-1		1.0E+00	1.6E-10			1.0E+00	1.8E-10		
SVOC	Methapyrilene	91-80-5		1.0E+00	6.4E-08			1.0E+00	2.4E-07		
SVOC	3-Methylcholanthrene	56-49-5		1.0E+00	4.2E-07			1.0E+00	4.4E-11		
SVOC	Methylmethanesulfonate	66-27-3		1.0E+00	6.7E-10			1.0E+00	2.1E-08		
SVOC	2-Methylnaphthalene	91-57-6	ID	1.0E+00	2.4E-04			1.0E+00	8.6E-05		
SVOC	Methylphenol (total)	1319-77-3		1.0E+00	3.5E-07			1.0E+00	3.9E-06		
SVOC	Naphthalene	91-20-3	C	1.0E+00	2.0E-04			1.0E+00	1.9E-04		
SVOC	1,4-Naphthoquinone	130-15-4		1.0E+00	7.6E-06			1.0E+00	1.7E-05		
SVOC	1-Naphthylamine	134-32-7		1.0E+00	2.3E-10			1.0E+00	7.1E-10		
SVOC	2-Naphthylamine	91-59-8		1.0E+00	2.7E-07			1.0E+00	1.5E-06		
SVOC	2-Nitroaniline	88-74-4	ID	1.0E+00	7.4E-08			1.0E+00	9.0E-07		
SVOC	3-Nitroaniline	99-09-2	C	1.0E+00	6.5E-08			1.0E+00	1.7E-06		
SVOC	4-Nitroaniline	100-01-6	LC	1.0E+00	1.8E-09			1.0E+00	2.5E-08		
SVOC	Nitrobenzene	98-95-3	D	1.0E+00	1.7E-05			1.0E+00	2.4E-04		
SVOC	2-Nitrophenol	88-75-5	ID	1.0E+00	3.2E-06			1.0E+00	5.9E-05		
SVOC	4-Nitrophenol	100-02-7		1.0E+00	4.4E-10			1.0E+00	2.5E-09		

Attachment A2: Risk-Based Routine Worker Cancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation				Soil Indoor Air Vapor Inhalation			
Chem Group	Chemical	CASRN	Cancer Class	C_{gw} (mg/L)	C_{air} (mg/m^3)	URF (m^3/mg)	GW Cancer Criteria (mg/L)	C_{soil} (mg/kg)	C_{air} (mg/m^3)	URF (m^3/mg)	Soil Cancer Criteria (mg/kg)
SVOC	4-Nitroquinoline-1-oxide	56-57-5		1.0E+00				1.0E+00	2.0E-02		
SVOC	N-Nitrosodi-n-butylamine	924-16-3	B2	1.0E+00	1.1E-04	1.6E+00	2.4E-01	1.0E+00	1.6E-03	1.6E+00	1.6E-02
SVOC	N-Nitrosodiethylamine	55-18-5	B2	1.0E+00	1.6E-06	4.3E+01	6.0E-01	1.0E+00	8.8E-05	4.3E+01	1.1E-02
SVOC	N-Nitrosodimethylamine	62-75-9	B2	1.0E+00	5.4E-07	1.4E+01	5.5E+00	1.0E+00	3.4E-05	1.4E+01	8.6E-02
SVOC	N-Nitrosodiphenylamine	86-30-6	B2	1.0E+00	2.4E-06			1.0E+00	3.6E-06		
SVOC	N-Nitroso-di-n-propylamine	621-64-7	B2	1.0E+00	1.9E-06	2.0E+00	1.1E+01	1.0E+00	6.1E-05	2.0E+00	3.3E-01
SVOC	N-Nitrosomethylethylamine	10595-95-6	B2	1.0E+00	4.0E-07	6.3E+00	1.6E+01	1.0E+00	2.4E-05	6.3E+00	2.7E-01
SVOC	N-Nitrosopiperidine	100-75-4		1.0E+00	1.3E-07			1.0E+00	7.1E-06		
SVOC	N-Nitrosopyrrolidine	930-55-2	B2	1.0E+00	8.3E-09	6.1E-01	8.1E+03	1.0E+00	3.3E-07	6.1E-01	2.0E+02
SVOC	5-Nitro-o-toluidine	99-55-8	C	1.0E+00	1.1E-08	9.4E-03	4.0E+05	1.0E+00	8.2E-08	9.4E-03	5.3E+04
SVOC	N-Nitrosomorpholine	59-89-2		1.0E+00	2.3E-08			1.0E+00	1.2E-06		
SVOC	2,2'-oxybis(1-Chloropropane)	108-60-1	C	1.0E+00	3.7E-05	1.0E-02	1.1E+02	1.0E+00	2.0E-04	1.0E-02	2.1E+01
SVOC	Pentachlorobenzene	608-93-5		1.0E+00	1.7E-04			1.0E+00	2.2E-05		
SVOC	Pentachloronitrobenzene	82-68-8		1.0E+00	1.2E-04			1.0E+00	3.1E-05		
SVOC	Pentachlorophenol	87-86-5	B2	1.0E+00	1.3E-08	3.4E-02	9.0E+04	1.0E+00	1.9E-08	3.4E-02	6.4E+04
SVOC	Phenacetin	62-44-2		1.0E+00	2.6E-10			1.0E+00	2.5E-09		
SVOC	Phenanthrene	85-01-8	D	1.0E+00	6.2E-06			1.0E+00	4.4E-07		
SVOC	Phenol	108-95-2	ID	1.0E+00	3.2E-07			1.0E+00	7.1E-06		
SVOC	p-Phenylene diamine	106-50-3		1.0E+00	7.2E-10			1.0E+00	2.2E-08		
SVOC	Phorate	298-02-2		1.0E+00	9.1E-08			1.0E+00	6.1E-08		
SVOC	2-Picoline	109-06-8		1.0E+00	4.3E-06			1.0E+00	1.7E-04		
SVOC	Pronamide	23950-58-5		1.0E+00	2.3E-06			1.0E+00	1.0E-06		
SVOC	Pyrene	129-00-0	NC	1.0E+00	2.6E-06			1.0E+00	5.3E-08		
SVOC	Pyridine	110-86-1		1.0E+00	4.1E-06			1.0E+00	2.0E-04		
SVOC	Safrole (total)	94-59-7		1.0E+00	7.8E-06			1.0E+00	2.0E-05		
SVOC	Sulfotepp	3689-24-5		1.0E+00	1.3E-06			1.0E+00	2.3E-07		
SVOC	1,2,4,5-Tetrachlorobenzene	95-94-3		1.0E+00	4.7E-04			1.0E+00	2.6E-04		
SVOC	2,3,4,6-Tetrachlorophenol	58-90-2		1.0E+00	1.9E-06			1.0E+00	6.8E-06		
SVOC	Thionazin	297-97-2		1.0E+00				1.0E+00	2.0E-02		
SVOC	o-Toluidine	95-53-4	B2	1.0E+00	1.2E-06	6.9E-02	5.0E+02	1.0E+00	3.6E-05	6.9E-02	1.6E+01
SVOC	2,4,5-Trichlorophenol	95-95-4	ID	1.0E+00	1.6E-06			1.0E+00	1.9E-06		
SVOC	2,4,6-Trichlorophenol	88-06-2	B2	1.0E+00	2.8E-06	3.1E-03	4.7E+03	1.0E+00	1.3E-05	3.1E-03	1.0E+03
SVOC	O,O,O-Triethyl phosphorothioate	126-68-1		1.0E+00				1.0E+00			
SVOC	1,3,5-Trinitrobenzene	99-35-4		1.0E+00	8.7E-09			1.0E+00	2.4E-07		
INORG	Aluminum	7429-90-5	ID	1.0E+00				1.0E+00			
INORG	Antimony	7440-36-0		1.0E+00				1.0E+00			
INORG	Arsenic	7440-38-2	A	1.0E+00		4.3E+00		1.0E+00		4.3E+00	
INORG	Barium	7440-39-3	NC	1.0E+00				1.0E+00			
INORG	Beryllium	7440-41-7	B1	1.0E+00		2.4E+00		1.0E+00		2.4E+00	
INORG	Cadmium	7440-43-9	B1	1.0E+00		1.8E+00		1.0E+00		1.8E+00	
INORG	Chromium (total)	7440-47-3		1.0E+00		1.2E+01		1.0E+00		1.2E+01	
INORG	Chromium III	16065-83-1	D	1.0E+00				1.0E+00			
INORG	Chromium VI	18540-29-9	A	1.0E+00		1.2E+01		1.0E+00		1.2E+01	
INORG	Cobalt	7440-48-4	LC	1.0E+00		2.8E+00		1.0E+00		2.8E+00	
INORG	Copper	7440-50-8	D	1.0E+00				1.0E+00			

Attachment A2: Risk-Based Routine Worker Cancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation				Soil Indoor Air Vapor Inhalation			
Chem Group	**Chemical**	**CASRN**	**Cancer Class**	**C_{gw}** (mg/L)	**C_{air}** (mg/m^3)	**URF** (m^3/mg)	**GW Cancer Criteria** (mg/L)	**C_{soil}** (mg/kg)	**C_{air}** (mg/m^3)	**URF** (m^3/mg)	**Soil Cancer Criteria** (mg/kg)
INORG	Iron	7439-89-6	D	1.0E+00				1.0E+00			
INORG	Manganese	7439-96-5	D	1.0E+00				1.0E+00			
INORG	Mercury	7439-97-6	D	1.0E+00	6.5E-04			1.0E+00	1.5E-05		
INORG	Nickel	7440-02-0	A	1.0E+00		2.4E-01		1.0E+00		2.4E-01	
INORG	Selenium	7782-49-2	D	1.0E+00				1.0E+00			
INORG	Silver	7440-22-4	D	1.0E+00				1.0E+00			
INORG	Thallium	7440-28-0		1.0E+00				1.0E+00			
INORG	Vanadium	7440-62-2		1.0E+00				1.0E+00			
INORG	Zinc	7440-66-6	ID	1.0E+00				1.0E+00			

Note:
Criteria are based on a target cancer risk of 1E-5.

Attachment A2: Risk-Based Routine Worker Noncancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation					Soil Indoor Air Vapor Inhalation				
Chem Group	**Chemical**	**CASRN**	**Cancer Class**	**C_{gw}** (mg/L)	**C_{air}** (mg/m^3)	**Dose** (mg/m^3)	**RfC** (mg/m^3)	**GW Noncancer Criteria** (mg/L)	**C_{soil}** (mg/kg)	**C_{air}** (mg/m^3)	**Dose** (mg/m^3)	**RfC** (mg/m^3)	**Soil Noncancer Criteria** (mg/kg)
VOC	Acetone	67-64-1	ID	1.0E+00	4.6E-05	3.1E-05	3.1E+01	9.9E+05	1.0E+00	2.6E-03	1.8E-03	3.1E+01	1.7E+04
VOC	Acetonitrile	75-05-8	D	1.0E+00	5.1E-05	3.5E-05	6.0E-02	1.7E+03	1.0E+00	2.8E-03	1.9E-03	6.0E-02	3.1E+01
VOC	Acrolein	107-02-8	ID	1.0E+00	1.5E-04	1.0E-04	2.0E-05	2.0E-01	1.0E+00	9.6E-03	6.6E-03	2.0E-05	3.0E-03
VOC	Acrylonitrile	107-13-1	B1	1.0E+00	1.3E-04	8.7E-05	2.0E-03	2.3E+01	1.0E+00	8.2E-03	5.6E-03	2.0E-03	3.6E-01
VOC	Benzene	71-43-2	A	1.0E+00	1.1E-03	7.2E-04	3.0E-02	4.2E+01	1.0E+00	2.0E-02	1.4E-02	3.0E-02	2.2E+00
VOC	Bromodichloromethane	75-27-4	B2	1.0E+00	4.2E-04	2.9E-04	7.0E-02	2.4E+02	1.0E+00	2.0E-02	1.4E-02	7.0E-02	5.1E+00
VOC	Bromoform	75-25-2	B2	1.0E+00	1.1E-04	7.4E-05			1.0E+00	4.5E-03	3.1E-03		
VOC	Bromomethane	74-83-9	ID	1.0E+00	1.3E-03	8.7E-04	5.0E-03	5.7E+00	1.0E+00	2.0E-02	1.4E-02	5.0E-03	3.6E-01
VOC	2-Butanone	78-93-3	ID	1.0E+00	6.1E-05	4.2E-05	5.0E+00	1.2E+05	1.0E+00	4.1E-03	2.8E-03	5.0E+00	1.8E+03
VOC	Carbon Disulfide	75-15-0		1.0E+00	1.6E-03	1.1E-03	7.0E-01	6.5E+02	1.0E+00	2.0E-02	1.4E-02	7.0E-01	5.1E+01
VOC	Carbon Tetrachloride	56-23-5	B2	1.0E+00	1.3E-03	9.2E-04	1.9E-01	2.1E+02	1.0E+00	2.0E-02	1.4E-02	1.9E-01	1.4E+01
VOC	2-Chloro-1,3-butadiene	126-99-8		1.0E+00	1.6E-03	1.1E-03	7.0E-03	6.3E+00	1.0E+00	2.0E-02	1.4E-02	7.0E-03	5.1E-01
VOC	3-Chloro-1-propene	107-05-1	C	1.0E+00	1.0E-03	7.0E-04	1.0E-03	1.4E+00	1.0E+00	2.0E-02	1.4E-02	1.0E-03	7.3E-02
VOC	Chlorobenzene	108-90-7	D	1.0E+00	8.0E-04	5.5E-04	5.0E-02	9.2E+01	1.0E+00	1.5E-02	1.0E-02	5.0E-02	4.9E+00
VOC	Chloroethane	75-00-3	LC	1.0E+00	1.7E-03	1.1E-03	1.0E+01	8.8E+03	1.0E+00	2.0E-02	1.4E-02	1.0E+01	7.3E+02
VOC	Chloroform	67-66-3	B2	1.0E+00	9.8E-04	6.7E-04	5.0E-02	7.4E+01	1.0E+00	2.0E-02	1.4E-02	5.0E-02	3.6E+00
VOC	Chloromethane	74-87-3	D	1.0E+00	9.4E-04	6.5E-04	9.0E-02	1.4E+02	1.0E+00	2.0E-02	1.4E-02	9.0E-02	6.5E+00
VOC	1,2-Dibromo-3-chloropropane	96-12-8	LC	1.0E+00	1.1E-04	7.8E-05	2.0E-04	2.6E+00	1.0E+00	9.8E-04	6.7E-04	2.0E-04	3.0E-01
VOC	Dibromochloromethane	124-48-1	C	1.0E+00	2.2E-04	1.5E-04	7.0E-02	4.8E+02	1.0E+00	1.1E-02	7.5E-03	7.0E-02	9.4E+00
VOC	1,2-Dibromoethane	106-93-4	LC	1.0E+00	3.2E-04	2.2E-04	9.0E-03	4.1E+01	1.0E+00	2.0E-02	1.4E-02	9.0E-03	6.5E-01
VOC	Dibromomethane	74-95-3		1.0E+00	4.6E-04	3.1E-04	3.5E-02	1.1E+02	1.0E+00	2.0E-02	1.4E-02	3.5E-02	2.5E+00
VOC	trans-1,4-Dichloro-2-butene	110-57-6		1.0E+00	6.8E-05	4.6E-05			1.0E+00	4.3E-03	2.9E-03		
VOC	1,2-Dichlorobenzene	95-50-1	D	1.0E+00	5.3E-04	3.6E-04	2.4E-02	6.6E+01	1.0E+00	2.6E-03	1.8E-03	2.4E-02	1.4E+01
VOC	1,3-Dichlorobenzene	541-73-1	D	1.0E+00	7.5E-04	5.1E-04	8.0E-03	1.6E+01	1.0E+00	6.4E-03	4.4E-03	8.0E-03	1.8E+00
VOC	1,4-Dichlorobenzene	106-46-7	C	1.0E+00	6.0E-04	4.1E-04	8.0E-01	1.9E+03	1.0E+00	3.4E-03	2.4E-03	8.0E-01	3.4E+02
VOC	Dichlorodifluoromethane	75-71-8		1.0E+00	3.9E-03	2.7E-03	2.0E-01	7.5E+01	1.0E+00	2.0E-02	1.4E-02	2.0E-01	1.5E+01
VOC	1,1-Dichloroethane	75-34-3	SC	1.0E+00	1.1E-03	7.4E-04	5.0E-01	6.7E+02	1.0E+00	2.0E-02	1.4E-02	5.0E-01	3.6E+01
VOC	1,2-Dichloroethane	107-06-2	B2	1.0E+00	5.2E-04	3.6E-04	5.0E-03	1.4E+01	1.0E+00	2.0E-02	1.4E-02	5.0E-03	3.6E-01
VOC	1,1-Dichloroethene	75-35-4	C	1.0E+00	1.5E-03	1.1E-03	2.0E-01	1.9E+02	1.0E+00	2.0E-02	1.4E-02	2.0E-01	1.5E+01
VOC	trans-1,2-Dichloroethene	156-60-5		1.0E+00	1.4E-03	9.3E-04	6.0E-02	6.5E+01	1.0E+00	2.0E-02	1.4E-02	6.0E-02	4.4E+00
VOC	1,2-Dichloropropane	78-87-5	B2	1.0E+00	7.5E-04	5.1E-04	4.0E-03	7.8E+00	1.0E+00	2.0E-02	1.4E-02	4.0E-03	2.9E-01
VOC	1,3-Dichloropropene (total)	542-75-6	B2	1.0E+00	1.3E-03	8.8E-04	2.0E-02	2.3E+01	1.0E+00	2.0E-02	1.4E-02	2.0E-02	1.5E+00
VOC	1,4-Dioxane	123-91-1	B2	1.0E+00	7.3E-06	5.0E-06	3.6E+00	7.2E+05	1.0E+00	3.1E-04	2.2E-04	3.6E+00	1.7E+04
VOC	Ethyl Benzene	100-41-4	D	1.0E+00	9.1E-04	6.2E-04	1.0E+00	1.6E+03	1.0E+00	1.9E-02	1.3E-02	1.0E+00	7.8E+01
VOC	Ethyl Methacrylate	97-63-2		1.0E+00	4.2E-04	2.9E-04	3.2E-01	1.1E+03	1.0E+00	1.6E-02	1.1E-02	3.2E-01	2.8E+01
VOC	2-Hexanone	591-78-6		1.0E+00	8.0E-05	5.5E-05	5.0E-03	9.1E+01	1.0E+00	3.2E-03	2.2E-03	5.0E-03	2.3E+00
VOC	Iodomethane	74-88-4		1.0E+00	8.0E-04	5.5E-04			1.0E+00	2.0E-02	1.4E-02		
VOC	Isobutyl Alcohol	78-83-1		1.0E+00	1.2E-05	8.4E-06	1.1E+00	1.3E+05	1.0E+00	6.3E-04	4.3E-04	1.1E+00	2.4E+03
VOC	Methacrylonitrile	126-98-7		1.0E+00	2.0E-04	1.4E-04	7.0E-04	5.1E+00	1.0E+00	1.6E-02	1.1E-02	7.0E-04	6.3E-02
VOC	4-Methyl-2-pentanone	108-10-1	ID	1.0E+00	1.2E-04	8.2E-05	3.0E+00	3.7E+04	1.0E+00	6.5E-03	4.5E-03	3.0E+00	6.7E+02
VOC	Methylene Chloride	75-09-2	B2	1.0E+00	9.0E-04	6.1E-04	1.0E+00	1.7E+03	1.0E+00	2.0E-02	1.4E-02	1.0E+00	7.6E+01
VOC	Methylmethacrylate	80-62-6	E	1.0E+00	2.4E-04	1.7E-04	7.0E-01	4.2E+03	1.0E+00	1.4E-02	9.5E-03	7.0E-01	7.4E+01
VOC	Pentachloroethane	76-01-7	LC	1.0E+00	5.6E-04	3.8E-04			1.0E+00	1.1E-02	7.5E-03		
VOC	Propionitrile	107-12-0		1.0E+00	6.5E-05	4.5E-05			1.0E+00	3.6E-03	2.5E-03		
VOC	Styrene	100-42-5		1.0E+00	6.6E-04	4.5E-04	1.0E+00	2.2E+03	1.0E+00	3.2E-03	2.2E-03	1.0E+00	4.5E+02

Attachment A2: Risk-Based Routine Worker Noncancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation					Soil Indoor Air Vapor Inhalation				
Chem Group	Chemical	CASRN	Cancer Class	C_{gw} (mg/L)	C_{air} (mg/m^3)	Dose (mg/m^3)	RfC (mg/m^3)	GW Noncancer Criteria (mg/L)	C_{soil} (mg/kg)	C_{air} (mg/m^3)	Dose (mg/m^3)	RfC (mg/m^3)	Soil Noncancer Criteria (mg/kg)
VOC	1,1,1,2-Tetrachloroethane	630-20-6	C	1.0E+00	6.9E-04	4.7E-04			1.0E+00	8.9E-03	6.1E-03		
VOC	1,1,2,2-Tetrachloroethane	79-34-5	C	1.0E+00	1.9E-04	1.3E-04			1.0E+00	2.9E-03	2.0E-03		
VOC	Tetrachloroethene	127-18-4	C-B2	1.0E+00	1.1E-03	7.6E-04	4.0E-01	5.2E+02	1.0E+00	2.0E-02	1.4E-02	4.0E-01	2.9E+01
VOC	Toluene	108-88-3	ID	1.0E+00	9.8E-04	6.7E-04	5.0E+00	7.4E+03	1.0E+00	2.0E-02	1.4E-02	5.0E+00	3.6E+02
VOC	1,2,4-Trichlorobenzene	120-82-1	D	1.0E+00	3.0E-04	2.1E-04	4.0E-03	1.9E+01	1.0E+00	6.1E-04	4.2E-04	4.0E-03	9.5E+00
VOC	1,1,1-Trichloroethane	71-55-6	ID	1.0E+00	1.2E-03	8.2E-04	5.0E+00	6.1E+03	1.0E+00	2.0E-02	1.4E-02	5.0E+00	3.6E+02
VOC	1,1,2-Trichloroethane	79-00-5	C	1.0E+00	4.1E-04	2.8E-04			1.0E+00	1.3E-02	9.1E-03		
VOC	Trichloroethene	79-01-6	C-B2	1.0E+00	1.1E-03	7.7E-04	5.4E-01	7.0E+02	1.0E+00	2.0E-02	1.4E-02	5.4E-01	3.9E+01
VOC	Trichlorofluoromethane	75-69-4		1.0E+00	2.2E-03	1.5E-03	7.0E-01	4.6E+02	1.0E+00	2.0E-02	1.4E-02	7.0E-01	5.1E+01
VOC	1,2,3-Trichloropropane	96-18-4	B2	1.0E+00	2.6E-04	1.8E-04	5.0E-03	2.8E+01	1.0E+00	8.1E-03	5.6E-03	5.0E-03	9.0E-01
VOC	Vinyl Acetate	108-05-4		1.0E+00	3.1E-04	2.1E-04	2.0E-01	9.5E+02	1.0E+00	2.0E-02	1.4E-02	2.0E-01	1.5E+01
VOC	Vinyl Chloride	75-01-4	A	1.0E+00	1.9E-03	1.3E-03	1.0E-01	7.8E+01	1.0E+00	2.0E-02	1.4E-02	1.0E-01	7.3E+00
VOC	Xylenes (total)	1330-20-7	ID	1.0E+00	9.6E-04	6.6E-04	1.0E-01	1.5E+02	1.0E+00	1.5E-02	1.1E-02	1.0E-01	9.5E+00
SVOC	Acenaphthene	83-32-9		1.0E+00	5.6E-05	3.8E-05	2.1E-01	5.5E+03	1.0E+00	1.4E-05	9.9E-06	2.1E-01	2.1E+04
SVOC	Acenaphthylene	208-96-8	D	1.0E+00	3.1E-05	2.1E-05	1.1E-01	5.0E+03	1.0E+00	6.9E-06	4.7E-06	1.1E-01	2.2E+04
SVOC	Acetophenone	98-86-2	D	1.0E+00	1.1E-05	7.3E-06	3.5E-01	4.8E+04	1.0E+00	2.3E-04	1.6E-04	3.5E-01	2.3E+03
SVOC	2-Acetylaminofluorene	53-96-3		1.0E+00	6.2E-07	4.2E-07			1.0E+00	8.2E-07	5.6E-07		
SVOC	4-Aminobiphenyl	92-67-1		1.0E+00	3.9E-10	2.6E-10			1.0E+00	3.5E-10	2.4E-10		
SVOC	Aniline	62-53-3	B2	1.0E+00	7.8E-07	5.4E-07	1.0E-03	1.9E+03	1.0E+00	3.7E-05	2.5E-05	1.0E-03	4.0E+01
SVOC	Anthracene	120-12-7	D	1.0E+00	1.9E-05	1.3E-05			1.0E+00	1.3E-06	8.7E-07		
SVOC	Aramite (total)	140-57-8	B2	1.0E+00	3.2E-07	2.2E-07			1.0E+00	2.0E-10	1.3E-10		
SVOC	Benzo(a)anthracene	56-55-3	B2	1.0E+00	1.1E-06	7.7E-07			1.0E+00	3.8E-09	2.6E-09		
SVOC	Benzo(a)pyrene	50-32-8	B2	1.0E+00	2.6E-07	1.8E-07			1.0E+00	3.6E-10	2.5E-10		
SVOC	Benzo(b)fluoranthene	205-99-2	B2	1.0E+00	1.6E-05	1.1E-05			1.0E+00	3.4E-08	2.3E-08		
SVOC	Benzo(g,h,i)perylene	191-24-2	D	1.0E+00	3.5E-08	2.4E-08	1.1E-01	4.4E+06	1.0E+00	5.0E-12	3.4E-12	1.1E-01	3.1E+10
SVOC	Benzo(k)fluoranthene	207-08-9	B2	1.0E+00	1.3E-07	9.0E-08			1.0E+00	2.3E-10	1.6E-10		
SVOC	Benzyl Alcohol	100-51-6	ID	1.0E+00	1.7E-07	1.2E-07	1.8E+00	1.5E+07	1.0E+00	6.4E-06	4.4E-06	1.8E+00	4.0E+05
SVOC	bis(2-Chloroethoxy)methane	111-91-1	D	1.0E+00	6.3E-08	4.3E-08	1.1E-02	2.4E+05	1.0E+00	2.3E-06	1.6E-06	1.1E-02	6.6E+03
SVOC	bis(2-Chloroethyl) ether	111-44-4	B2	1.0E+00	1.2E-05	8.0E-06	1.2E-01	1.5E+04	1.0E+00	4.5E-04	3.1E-04	1.2E-01	3.8E+02
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	1.0E+00	2.6E-08	1.8E-08	7.0E-02	3.9E+06	1.0E+00	2.4E-12	1.7E-12	7.0E-02	4.2E+10
SVOC	4-Bromophenyl-phenyl ether	101-55-3	D	1.0E+00	2.2E-05	1.5E-05			1.0E+00	3.2E-06	2.2E-06		
SVOC	2-sec-Butyl-4,6-dinitrophenol	88-85-7	D	1.0E+00	2.1E-07	1.4E-07	3.5E-03	2.4E+04	1.0E+00	4.9E-08	3.4E-08	3.5E-03	1.0E+05
SVOC	Butylbenzylphthalate	85-68-7	C	1.0E+00	2.1E-07	1.4E-07	7.0E-01	4.9E+06	1.0E+00	1.0E-08	6.8E-09	7.0E-01	1.0E+08
SVOC	4-Chloro-3-methylphenol	59-50-7		1.0E+00	1.6E-07	1.1E-07	2.5E+00	2.2E+07	1.0E+00	1.6E-07	1.1E-07	2.5E+00	2.2E+07
SVOC	4-Chloroaniline	106-47-8	LC	1.0E+00	1.9E-07	1.3E-07	1.4E-02	1.1E+05	1.0E+00	2.9E-06	2.0E-06	1.4E-02	7.0E+03
SVOC	p-Chlorobenzilate	510-15-6	B2	1.0E+00	3.8E-08	2.6E-08			1.0E+00	1.7E-09	1.2E-09		
SVOC	2-Chloronaphthalene	91-58-7		1.0E+00	8.3E-05	5.7E-05	2.8E-01	4.9E+03	1.0E+00	1.3E-05	8.7E-06	2.8E-01	3.2E+04
SVOC	2-Chlorophenol	95-57-8	ID	1.0E+00	1.7E-04	1.2E-04	1.8E-02	1.5E+02	1.0E+00	8.4E-04	5.7E-04	1.8E-02	3.1E+01
SVOC	4-Chlorophenyl-phenyl ether	7005-72-3		1.0E+00	4.2E-05	2.9E-05			1.0E+00	9.6E-06	6.6E-06		
SVOC	Chrysene	218-01-9	B2	1.0E+00	1.6E-05	1.1E-05			1.0E+00	9.5E-08	6.5E-08		
SVOC	Diallate (total)	2303-16-4	B2	1.0E+00	6.9E-07	4.7E-07			1.0E+00	2.8E-11	1.9E-11		
SVOC	Dibenz(a,h)anthracene	53-70-3	B2	1.0E+00	2.8E-09	1.9E-09			1.0E+00	4.6E-13	3.2E-13		
SVOC	Dibenzofuran	132-64-9	D	1.0E+00	6.9E-07	4.7E-07			1.0E+00	7.5E-08	5.1E-08		
SVOC	3,3'-Dichlorobenzidine	91-94-1	B2	1.0E+00	2.3E-09	1.6E-09			1.0E+00	1.8E-09	1.2E-09		
SVOC	2,4-Dichlorophenol	120-83-2	ID	1.0E+00	1.0E-06	7.1E-07	1.1E-02	1.5E+04	1.0E+00	1.1E-05	7.4E-06	1.1E-02	1.4E+03

Attachment A2: Risk-Based Routine Worker Noncancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation					Soil Indoor Air Vapor Inhalation				
Chem Group	Chemical	CASRN	Cancer Class	C_{gw} (mg/L)	C_{air} (mg/m^3)	Dose (mg/m^3)	RfC (mg/m^3)	GW Noncancer Criteria (mg/L)	C_{soil} (mg/kg)	C_{air} (mg/m^3)	Dose (mg/m^3)	RfC (mg/m^3)	Soil Noncancer Criteria (mg/kg)
SVOC	2,6-Dichlorophenol	87-65-0		1.0E+00	1.2E-05	8.5E-06			1.0E+00	2.6E-05	1.8E-05		
SVOC	Diethylphthalate	84-66-2	D	1.0E+00	1.2E-07	8.4E-08	2.8E+00	3.3E+07	1.0E+00	7.9E-07	5.4E-07	2.8E+00	5.2E+06
SVOC	Dimethoate	60-51-5		1.0E+00	1.9E-10	1.3E-10	7.0E-04	5.3E+06	1.0E+00	2.0E-10	1.4E-10	7.0E-04	5.0E+06
SVOC	p-(Dimethylamino)azobenzene	60-11-7		1.0E+00	3.9E-10	2.6E-10			1.0E+00	6.2E-12	4.3E-12		
SVOC	7,12-Dimethylbenz(a)anthracene	57-97-6		1.0E+00	1.8E-08	1.2E-08			1.0E+00	2.9E-11	2.0E-11		
SVOC	3,3'-Dimethylbenzidine	119-93-7	LC	1.0E+00	1.9E-10	1.3E-10			1.0E+00	4.5E-10	3.1E-10		
SVOC	a,a-Dimethylphenethylamine	122-09-8		1.0E+00			3.5E-03		1.0E+00	2.0E-02	1.4E-02	3.5E-03	2.5E-01
SVOC	2,4-Dimethylphenol	105-67-9	ID	1.0E+00	1.2E-06	8.2E-07			1.0E+00	6.6E-06	4.5E-06		
SVOC	Dimethylphthalate	131-11-3	D	1.0E+00	4.5E-08	3.1E-08			1.0E+00	5.7E-07	3.9E-07		
SVOC	Di-n-butylphthalate	84-74-2	D	1.0E+00	8.6E-10	5.9E-10			1.0E+00	1.3E-11	9.0E-12		
SVOC	4,6-Dinitro-2-methylphenol	534-52-1	ID	1.0E+00	1.1E-07	7.3E-08			1.0E+00	1.4E-06	9.6E-07		
SVOC	1,3-Dinitrobenzene	99-65-0	D	1.0E+00	1.6E-07	1.1E-07	3.5E-04	3.1E+03	1.0E+00	2.4E-06	1.6E-06	3.5E-04	2.2E+02
SVOC	2,4-Dinitrophenol	51-28-5	ID	1.0E+00	5.9E-08	4.0E-08			1.0E+00	5.8E-06	4.0E-06		
SVOC	2,4-Dinitrotoluene	121-14-2	B2	1.0E+00	7.6E-08	5.2E-08			1.0E+00	4.8E-07	3.3E-07		
SVOC	2,6-Dinitrotoluene	606-20-2	B2	1.0E+00	2.6E-07	1.8E-07	3.5E-03	2.0E+04	1.0E+00	5.2E-06	3.5E-06	3.5E-03	9.9E+02
SVOC	Di-n-octylphthalate	117-84-0		1.0E+00	7.7E-06	5.3E-06			1.0E+00	3.3E-10	2.2E-10		
SVOC	Diphenylamine	122-39-4		1.0E+00	2.1E-07	1.4E-07	8.8E-02	6.2E+05	1.0E+00	1.5E-07	1.1E-07	8.8E-02	8.3E+05
SVOC	Disulfoton	298-04-4		1.0E+00	1.7E-06	1.2E-06	2.0E-04	1.7E+02	1.0E+00	2.4E-07	1.7E-07	2.0E-04	1.2E+03
SVOC	Ethylmethanesulfonate	62-50-0		1.0E+00	2.3E-06	1.6E-06			1.0E+00	1.4E-04	9.8E-05		
SVOC	Famphur	52-85-7		1.0E+00	7.7E-09	5.3E-09			1.0E+00	4.3E-08	2.9E-08		
SVOC	Fluoranthene	206-44-0	D	1.0E+00	4.3E-06	2.9E-06	1.4E-01	4.8E+04	1.0E+00	7.8E-08	5.4E-08	1.4E-01	2.6E+06
SVOC	Fluorene	86-73-7	D	1.0E+00	2.3E-05	1.5E-05	1.4E-01	9.1E+03	1.0E+00	3.1E-06	2.1E-06	1.4E-01	6.7E+04
SVOC	Hexachlorobenzene	118-74-1	B2	1.0E+00	2.6E-04	1.8E-04			1.0E+00	1.3E-05	8.7E-06		
SVOC	Hexachlorobutadiene	87-68-3	C	1.0E+00	7.0E-04	4.8E-04			1.0E+00	1.2E-04	8.6E-05		
SVOC	Hexachlorocyclopentadiene	77-47-4	E	1.0E+00	8.0E-04	5.5E-04	2.0E-04	3.6E-01	1.0E+00	9.8E-05	6.7E-05	2.0E-04	3.0E+00
SVOC	Hexachloroethane	67-72-1	C	1.0E+00	1.2E-04	8.4E-05	5.8E+01	6.9E+05	1.0E+00	1.4E-03	9.3E-04	5.8E+01	6.2E+04
SVOC	Hexachloropropene	1888-71-7		1.0E+00					1.0E+00	2.0E-02	1.4E-02		
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	1.0E+00	1.9E-07	1.3E-07			1.0E+00	1.4E-10	9.4E-11		
SVOC	Isophorone	78-59-1	C	1.0E+00	4.3E-06	2.9E-06			1.0E+00	8.4E-05	5.8E-05		
SVOC	Isosafrole (total)	120-58-1		1.0E+00	1.6E-10	1.1E-10			1.0E+00	1.8E-10	1.3E-10		
SVOC	Methapyrilene	91-80-5		1.0E+00	6.4E-08	4.4E-08			1.0E+00	2.4E-07	1.7E-07		
SVOC	3-Methylcholanthrene	56-49-5		1.0E+00	4.2E-07	2.9E-07			1.0E+00	4.4E-11	3.0E-11		
SVOC	Methylmethanesulfonate	66-27-3		1.0E+00	6.7E-10	4.6E-10			1.0E+00	2.1E-08	1.5E-08		
SVOC	2-Methylnaphthalene	91-57-6	ID	1.0E+00	2.4E-04	1.6E-04			1.0E+00	8.6E-05	5.9E-05		
SVOC	Methylphenol (total)	1319-77-3		1.0E+00	3.5E-07	2.4E-07			1.0E+00	3.9E-06	2.7E-06		
SVOC	Naphthalene	91-20-3	C	1.0E+00	2.0E-04	1.3E-04	3.0E-03	2.2E+01	1.0E+00	1.9E-04	1.3E-04	3.0E-03	2.3E+01
SVOC	1,4-Naphthoquinone	130-15-4		1.0E+00	7.6E-06	5.2E-06			1.0E+00	1.7E-05	1.2E-05		
SVOC	1-Naphthylamine	134-32-7		1.0E+00	2.3E-10	1.6E-10			1.0E+00	7.1E-10	4.8E-10		
SVOC	2-Naphthylamine	91-59-8		1.0E+00	2.7E-07	1.9E-07			1.0E+00	1.5E-06	1.1E-06		
SVOC	2-Nitroaniline	88-74-4	ID	1.0E+00	7.4E-08	5.1E-08	1.0E-04	2.0E+03	1.0E+00	9.0E-07	6.1E-07	1.0E-04	1.6E+02
SVOC	3-Nitroaniline	99-09-2	C	1.0E+00	6.5E-08	4.4E-08	1.0E-03	2.3E+04	1.0E+00	1.7E-06	1.2E-06	1.0E-03	8.4E+02
SVOC	4-Nitroaniline	100-01-6	LC	1.0E+00	1.8E-09	1.2E-09	4.0E-03	3.3E+06	1.0E+00	2.5E-08	1.7E-08	4.0E-03	2.4E+05
SVOC	Nitrobenzene	98-95-3	D	1.0E+00	1.7E-05	1.1E-05	2.0E-03	1.8E+02	1.0E+00	2.4E-04	1.6E-04	2.0E-03	1.2E+01
SVOC	2-Nitrophenol	88-75-5	ID	1.0E+00	3.2E-06	2.2E-06	5.0E-04	2.2E+02	1.0E+00	5.9E-05	4.0E-05	5.0E-04	1.2E+01
SVOC	4-Nitrophenol	100-02-7		1.0E+00	4.4E-10	3.0E-10	2.8E-02	9.2E+07	1.0E+00	2.5E-09	1.7E-09	2.8E-02	1.7E+07

Attachment A2: Risk-Based Routine Worker Noncancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation					Soil Indoor Air Vapor Inhalation				
Chem Group	Chemical	CASRN	Cancer Class	C_{gw} (mg/L)	C_{air} (mg/m^3)	Dose (mg/m^3)	RfC (mg/m^3)	GW Noncancer Criteria (mg/L)	C_{soil} (mg/kg)	C_{air} (mg/m^3)	Dose (mg/m^3)	RfC (mg/m^3)	Soil Noncancer Criteria (mg/kg)
SVOC	4-Nitroquinoline-1-oxide	56-57-5		1.0E+00					1.0E+00	2.0E-02	1.4E-02		
SVOC	N-Nitrosodi-n-butylamine	924-16-3	B2	1.0E+00	1.1E-04	7.2E-05			1.0E+00	1.6E-03	1.1E-03		
SVOC	N-Nitrosodiethylamine	55-18-5	B2	1.0E+00	1.6E-06	1.1E-06			1.0E+00	8.8E-05	6.0E-05		
SVOC	N-Nitrosodimethylamine	62-75-9	B2	1.0E+00	5.4E-07	3.7E-07			1.0E+00	3.4E-05	2.3E-05		
SVOC	N-Nitrosodiphenylamine	86-30-6	B2	1.0E+00	2.4E-06	1.7E-06			1.0E+00	3.6E-06	2.4E-06		
SVOC	N-Nitroso-di-n-propylamine	621-64-7	B2	1.0E+00	1.9E-06	1.3E-06			1.0E+00	6.1E-05	4.2E-05		
SVOC	N-Nitrosomethylethylamine	10595-95-6	B2	1.0E+00	4.0E-07	2.7E-07			1.0E+00	2.4E-05	1.6E-05		
SVOC	N-Nitrosopiperidine	100-75-4		1.0E+00	1.3E-07	9.0E-08			1.0E+00	7.1E-06	4.8E-06		
SVOC	N-Nitrosopyrrolidine	930-55-2	B2	1.0E+00	8.3E-09	5.7E-09			1.0E+00	3.3E-07	2.3E-07		
SVOC	5-Nitro-o-toluidine	99-55-8	C	1.0E+00	1.1E-08	7.4E-09			1.0E+00	8.2E-08	5.6E-08		
SVOC	N-Nitrosomorpholine	59-89-2		1.0E+00	2.3E-08	1.5E-08			1.0E+00	1.2E-06	8.1E-07		
SVOC	2,2'-oxybis(1-Chloropropane)	108-60-1	C	1.0E+00	3.7E-05	2.6E-05			1.0E+00	2.0E-04	1.3E-04		
SVOC	Pentachlorobenzene	608-93-5		1.0E+00	1.7E-04	1.2E-04	2.8E-03	2.3E+01	1.0E+00	2.2E-05	1.5E-05	2.8E-03	1.9E+02
SVOC	Pentachloronitrobenzene	82-68-8		1.0E+00	1.2E-04	8.4E-05	1.1E-02	1.2E+02	1.0E+00	3.1E-05	2.1E-05	1.1E-02	5.0E+02
SVOC	Pentachlorophenol	87-86-5	B2	1.0E+00	1.3E-08	9.1E-09	1.1E-01	1.2E+07	1.0E+00	1.9E-08	1.3E-08	1.1E-01	8.2E+06
SVOC	Phenacetin	62-44-2		1.0E+00	2.6E-10	1.8E-10			1.0E+00	2.5E-09	1.7E-09		
SVOC	Phenanthrene	85-01-8	D	1.0E+00	6.2E-06	4.2E-06	1.1E-01	2.5E+04	1.0E+00	4.4E-07	3.0E-07	1.1E-01	3.5E+05
SVOC	Phenol	108-95-2	ID	1.0E+00	3.2E-07	2.2E-07			1.0E+00	7.1E-06	4.8E-06		
SVOC	p-Phenylene diamine	106-50-3		1.0E+00	7.2E-10	5.0E-10	6.7E-01	1.3E+09	1.0E+00	2.2E-08	1.5E-08	6.7E-01	4.3E+07
SVOC	Phorate	298-02-2		1.0E+00	9.1E-08	6.2E-08	7.0E-04	1.1E+04	1.0E+00	6.1E-08	4.2E-08	7.0E-04	1.7E+04
SVOC	2-Picoline	109-06-8		1.0E+00	4.3E-06	2.9E-06			1.0E+00	1.7E-04	1.2E-04		
SVOC	Pronamide	23950-58-5		1.0E+00	2.3E-06	1.6E-06	2.6E-01	1.6E+05	1.0E+00	1.0E-06	7.1E-07	2.6E-01	3.7E+05
SVOC	Pyrene	129-00-0	NC	1.0E+00	2.6E-06	1.8E-06	1.1E-01	5.8E+04	1.0E+00	5.3E-08	3.6E-08	1.1E-01	2.9E+06
SVOC	Pyridine	110-86-1		1.0E+00	4.1E-06	2.8E-06	3.5E-03	1.3E+03	1.0E+00	2.0E-04	1.4E-04	3.5E-03	2.5E+01
SVOC	Safrole (total)	94-59-7		1.0E+00	7.8E-06	5.4E-06			1.0E+00	2.0E-05	1.4E-05		
SVOC	Sulfotepp	3689-24-5		1.0E+00	1.3E-06	8.7E-07	1.8E-03	2.0E+03	1.0E+00	2.3E-07	1.6E-07	1.8E-03	1.1E+04
SVOC	1,2,4,5-Tetrachlorobenzene	95-94-3		1.0E+00	4.7E-04	3.2E-04	1.1E-03	3.3E+00	1.0E+00	2.6E-04	1.8E-04	1.1E-03	5.8E+00
SVOC	2,3,4,6-Tetrachlorophenol	58-90-2		1.0E+00	1.9E-06	1.3E-06	1.1E-01	8.0E+04	1.0E+00	6.8E-06	4.7E-06	1.1E-01	2.2E+04
SVOC	Thionazin	297-97-2		1.0E+00					1.0E+00	2.0E-02	1.4E-02		
SVOC	o-Toluidine	95-53-4	B2	1.0E+00	1.2E-06	8.2E-07			1.0E+00	3.6E-05	2.5E-05		
SVOC	2,4,5-Trichlorophenol	95-95-4	ID	1.0E+00	1.6E-06	1.1E-06			1.0E+00	1.9E-06	1.3E-06		
SVOC	2,4,6-Trichlorophenol	88-06-2	B2	1.0E+00	2.8E-06	1.9E-06			1.0E+00	1.3E-05	9.0E-06		
SVOC	O,O,O-Triethyl phosphorothioate	126-68-1		1.0E+00					1.0E+00				
SVOC	1,3,5-Trinitrobenzene	99-35-4		1.0E+00	8.7E-09	5.9E-09	1.1E-01	1.8E+07	1.0E+00	2.4E-07	1.7E-07	1.1E-01	6.3E+05
INORG	Aluminum	7429-90-5	ID	1.0E+00			5.0E-03		1.0E+00			5.0E-03	
INORG	Antimony	7440-36-0		1.0E+00			1.4E-03		1.0E+00			1.4E-03	
INORG	Arsenic	7440-38-2	A	1.0E+00					1.0E+00				
INORG	Barium	7440-39-3	NC	1.0E+00					1.0E+00				
INORG	Beryllium	7440-41-7	B1	1.0E+00			2.0E-05		1.0E+00			2.0E-05	
INORG	Cadmium	7440-43-9	B1	1.0E+00			2.0E-04		1.0E+00			2.0E-04	
INORG	Chromium (total)	7440-47-3		1.0E+00			1.0E-04		1.0E+00			1.0E-04	
INORG	Chromium III	16065-83-1	D	1.0E+00			5.3E+00		1.0E+00			5.3E+00	
INORG	Chromium VI	18540-29-9	A	1.0E+00			1.0E-04		1.0E+00			1.0E-04	
INORG	Cobalt	7440-48-4	LC	1.0E+00			2.0E-05		1.0E+00			2.0E-05	
INORG	Copper	7440-50-8	D	1.0E+00			1.4E-01		1.0E+00			1.4E-01	

Attachment A2: Risk-Based Routine Worker Noncancer Criteria for Vapor Intrusion in a Commercial/Industrial Slab-on-Grade Building
Bway Corporation, Cincinnati, Ohio

				Groundwater Indoor Air Vapor Inhalation					Soil Indoor Air Vapor Inhalation				
Chem Group	**Chemical**	**CASRN**	**Cancer Class**	**C_{gw}** (mg/L)	**C_{air}** (mg/m^3)	**Dose** (mg/m^3)	**RfC** (mg/m^3)	**GW Noncancer Criteria** (mg/L)	**C_{soil}** (mg/kg)	**C_{air}** (mg/m^3)	**Dose** (mg/m^3)	**RfC** (mg/m^3)	**Soil Noncancer Criteria** (mg/kg)
INORG	Iron	7439-89-6	D	1.0E+00					1.0E+00				
INORG	Manganese	7439-96-5	D	1.0E+00			5.0E-05		1.0E+00			5.0E-05	
INORG	Mercury	7439-97-6	D	1.0E+00	6.5E-04	4.5E-04	3.0E-04	6.7E-01	1.0E+00	1.5E-05	1.0E-05	3.0E-04	2.9E+01
INORG	Nickel	7440-02-0	A	1.0E+00			9.0E-05		1.0E+00			9.0E-05	
INORG	Selenium	7782-49-2	D	1.0E+00			1.8E-02		1.0E+00			1.8E-02	
INORG	Silver	7440-22-4	D	1.0E+00			1.0E-05		1.0E+00			1.0E-05	
INORG	Thallium	7440-28-0		1.0E+00			2.5E-04		1.0E+00			2.5E-04	
INORG	Vanadium	7440-62-2		1.0E+00			2.5E-02		1.0E+00			2.5E-02	
INORG	Zinc	7440-66-6	ID	1.0E+00			1.1E+00		1.0E+00			1.1E+00	

Note:
Criteria are based on a target HQ of 1.

ATTACHMENT A3

Risk Estimates for Hypothetical Trespasser Exposures

Attachment A3: Nonsteady-State Dermal Absorption from Water
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	MW (g/mole)	FA (unitless)	K_p (cm/hr)	B (unitless)	τ (hr)	c	b	ts (hr)	DA (L/cm^2-event)
VOC	Acetone	67-64-1	5.8E+01	1.0E+00	5.2E-04	1.5E-03	2.2E-01	3.3E-01	3.0E-01	5.3E-01	7.5E-07
VOC	Acetonitrile	75-05-8	4.1E+01	1.0E+00	5.6E-04	1.4E-03	1.8E-01	3.3E-01	3.0E-01	4.3E-01	7.6E-07
VOC	Acrolein	107-02-8	5.6E+01	1.0E+00	6.7E-04	1.9E-03	2.2E-01	3.3E-01	3.0E-01	5.2E-01	9.6E-07
VOC	Acrylonitrile	107-13-1	5.3E+01	1.0E+00	2.0E-04	5.5E-04	2.1E-01	3.3E-01	3.0E-01	5.0E-01	2.8E-07
VOC	Benzene	71-43-2	7.8E+01	1.0E+00	1.5E-02	5.0E-02	2.9E-01	3.7E-01	3.3E-01	6.9E-01	2.3E-05
VOC	Bromodichloromethane	75-27-4	1.6E+02	1.0E+00	4.7E-03	2.3E-02	8.7E-01	3.5E-01	3.2E-01	2.1E+00	1.2E-05
VOC	Bromoform	75-25-2	2.5E+02	1.0E+00	2.2E-03	1.3E-02	2.7E+00	3.4E-01	3.1E-01	6.6E+00	9.9E-06
VOC	Bromomethane	74-83-9	9.5E+01	1.0E+00	2.8E-03	1.1E-02	3.6E-01	3.4E-01	3.1E-01	8.6E-01	4.9E-06
VOC	2-Butanone	78-93-3	7.2E+01	1.0E+00	9.6E-04	3.1E-03	2.7E-01	3.4E-01	3.1E-01	6.4E-01	1.5E-06
VOC	Carbon Disulfide	75-15-0	7.6E+01	1.0E+00	1.2E-02	4.2E-02	2.8E-01	3.6E-01	3.3E-01	6.7E-01	1.9E-05
VOC	Carbon Tetrachloride	56-23-5	1.5E+02	1.0E+00	1.4E-02	6.6E-02	7.6E-01	3.8E-01	3.4E-01	1.8E+00	3.3E-05
VOC	2-Chloro-1,3-butadiene	126-99-8	8.9E+01	1.0E+00	1.2E-03	4.4E-03	3.3E-01	3.4E-01	3.1E-01	7.9E-01	2.0E-06
VOC	3-Chloro-1-propene	107-05-1	7.7E+01	1.0E+00	2.5E-03	8.6E-03	2.8E-01	3.4E-01	3.1E-01	6.8E-01	4.0E-06
VOC	Chlorobenzene	108-90-7	1.1E+02	1.0E+00	2.9E-02	1.2E-01	4.5E-01	4.2E-01	3.8E-01	1.1E+00	5.3E-05
VOC	Chloroethane	75-00-3	6.5E+01	1.0E+00	6.1E-03	1.9E-02	2.4E-01	3.5E-01	3.1E-01	5.8E-01	8.9E-06
VOC	Chloroform	67-66-3	1.2E+02	1.0E+00	6.3E-03	2.6E-02	4.9E-01	3.5E-01	3.2E-01	1.2E+00	1.2E-05
VOC	Chloromethane	74-87-3	5.0E+01	1.0E+00	1.5E-02	4.2E-02	2.0E-01	3.6E-01	3.3E-01	4.8E-01	2.1E-05
VOC	1,2-Dibromo-3-chloropropane	96-12-8	2.4E+02	1.0E+00	4.1E-03	2.4E-02	2.2E+00	3.5E-01	3.2E-01	5.3E+00	1.7E-05
VOC	Dibromochloromethane	124-48-1	2.1E+02	1.0E+00	2.9E-03	1.6E-02	1.5E+00	3.4E-01	3.1E-01	3.7E+00	1.0E-05
VOC	1,2-Dibromoethane	106-93-4	1.9E+02	1.0E+00	1.6E-03	8.4E-03	1.2E+00	3.4E-01	3.1E-01	2.8E+00	4.8E-06
VOC	Dibromomethane	74-95-3	1.7E+02	1.0E+00	1.7E-03	8.7E-03	9.9E-01	3.4E-01	3.1E-01	2.4E+00	4.7E-06
VOC	trans-1,4-Dichloro-2-butene	110-57-6	1.3E+02	1.0E+00	1.2E-03	5.1E-03	5.3E-01	3.4E-01	3.1E-01	1.3E+00	2.4E-06
VOC	1,2-Dichlorobenzene	95-50-1	1.5E+02	1.0E+00	4.4E-02	2.0E-01	7.0E-01	4.8E-01	4.4E-01	1.7E+00	1.0E-04
VOC	1,3-Dichlorobenzene	541-73-1	1.5E+02	1.0E+00	4.1E-02	1.9E-01	7.0E-01	4.7E-01	4.3E-01	1.7E+00	9.4E-05
VOC	1,4-Dichlorobenzene	106-46-7	1.5E+02	1.0E+00	4.3E-02	2.0E-01	7.0E-01	4.8E-01	4.4E-01	1.7E+00	1.0E-04
VOC	Dichlorodifluoromethane	75-71-8	1.2E+02	1.0E+00	8.9E-03	3.8E-02	5.0E-01	3.6E-01	3.3E-01	1.2E+00	1.7E-05
VOC	1,1-Dichloroethane	75-34-3	9.9E+01	1.0E+00	6.7E-03	2.6E-02	3.8E-01	3.5E-01	3.2E-01	9.0E-01	1.2E-05
VOC	1,2-Dichloroethane	107-06-2	9.9E+01	1.0E+00	4.1E-03	1.6E-02	3.8E-01	3.4E-01	3.1E-01	9.0E-01	7.2E-06
VOC	1,1-Dichloroethene	75-35-4	9.7E+01	1.0E+00	1.2E-02	4.4E-02	3.7E-01	3.6E-01	3.3E-01	8.8E-01	2.0E-05
VOC	trans-1,2-Dichloroethene	156-60-5	9.7E+01	1.0E+00	1.1E-02	4.0E-02	3.7E-01	3.6E-01	3.3E-01	8.8E-01	1.8E-05
VOC	1,2-Dichloropropane	78-87-5	1.1E+02	1.0E+00	7.4E-03	3.0E-02	4.5E-01	3.5E-01	3.2E-01	1.1E+00	1.4E-05
VOC	1,3-Dichloropropene (total)	542-75-6	1.1E+02	1.0E+00	7.9E-03	3.2E-02	4.4E-01	3.6E-01	3.2E-01	1.1E+00	1.5E-05
VOC	1,4-Dioxane	123-91-1	8.8E+01	1.0E+00	2.7E-04	9.7E-04	3.3E-01	3.3E-01	3.0E-01	7.9E-01	4.4E-07
VOC	Ethyl Benzene	100-41-4	1.1E+02	1.0E+00	4.8E-02	1.9E-01	4.1E-01	4.7E-01	4.3E-01	9.9E-01	8.7E-05
VOC	Ethyl Methacrylate	97-63-2	1.1E+02	1.0E+00	6.9E-03	2.9E-02	4.6E-01	3.5E-01	3.2E-01	1.1E+00	1.3E-05
VOC	2-Hexanone	591-78-6	1.0E+02	1.0E+00	3.5E-03	1.4E-02	3.8E-01	3.4E-01	3.1E-01	9.2E-01	6.3E-06
VOC	Iodomethane	74-88-4	1.4E+02	1.0E+00	3.3E-03	1.5E-02	6.6E-01	3.4E-01	3.1E-01	1.6E+00	7.4E-06
VOC	Isobutyl Alcohol	78-83-1	7.4E+01	1.0E+00	2.2E-03	7.1E-03	2.7E-01	3.4E-01	3.1E-01	6.6E-01	3.3E-06
VOC	Methacrylonitrile	126-98-7	6.7E+01	1.0E+00	1.5E-03	4.8E-03	2.5E-01	3.4E-01	3.1E-01	6.0E-01	2.3E-06

Attachment A3: Nonsteady-State Dermal Absorption from Water
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	MW (g/mole)	FA (unitless)	K_p (cm/hr)	B (unitless)	τ (hr)	c	b	ts (hr)	DA (L/cm^2-event)
VOC	4-Methyl-2-pentanone	108-10-1	1.0E+02	1.0E+00	2.7E-03	1.0E-02	3.8E-01	3.4E-01	3.1E-01	9.2E-01	4.7E-06
VOC	Methylene Chloride	75-09-2	8.5E+01	1.0E+00	3.5E-03	1.3E-02	3.1E-01	3.4E-01	3.1E-01	7.5E-01	5.8E-06
VOC	Methylmethacrylate	80-62-6	1.0E+02	1.0E+00	3.3E-03	1.3E-02	3.8E-01	3.4E-01	3.1E-01	9.2E-01	5.8E-06
VOC	Pentachloroethane	76-01-7	2.0E+02	1.0E+00	7.3E-03	4.0E-02	1.4E+00	3.6E-01	3.3E-01	3.4E+00	2.4E-05
VOC	Propionitrile	107-12-0	5.5E+01	1.0E+00	8.3E-04	2.4E-03	2.1E-01	3.3E-01	3.0E-01	5.1E-01	1.2E-06
VOC	Styrene	100-42-5	1.0E+02	1.0E+00	3.6E-02	1.4E-01	4.0E-01	4.3E-01	4.0E-01	9.7E-01	6.5E-05
VOC	1,1,1,2-Tetrachloroethane	630-20-6	1.7E+02	1.0E+00	1.8E-02	9.2E-02	9.2E-01	4.0E-01	3.6E-01	2.2E+00	4.9E-05
VOC	1,1,2,2-Tetrachloroethane	79-34-5	1.7E+02	1.0E+00	6.9E-03	3.4E-02	9.2E-01	3.6E-01	3.2E-01	2.2E+00	1.8E-05
VOC	Tetrachloroethene	127-18-4	1.7E+02	1.0E+00	1.1E-02	5.4E-02	8.9E-01	3.7E-01	3.4E-01	2.1E+00	2.8E-05
VOC	Toluene	108-88-3	9.2E+01	1.0E+00	3.2E-02	1.2E-01	3.5E-01	4.2E-01	3.8E-01	8.3E-01	5.3E-05
VOC	1,2,4-Trichlorobenzene	120-82-1	1.8E+02	1.0E+00	6.8E-02	3.5E-01	1.1E+00	6.0E-01	5.6E-01	2.6E+00	2.0E-04
VOC	1,1,1-Trichloroethane	71-55-6	1.3E+02	1.0E+00	1.2E-02	5.5E-02	5.9E-01	3.7E-01	3.4E-01	1.4E+00	2.6E-05
VOC	1,1,2-Trichloroethane	79-00-5	1.3E+02	1.0E+00	6.4E-03	2.8E-02	5.9E-01	3.5E-01	3.2E-01	1.4E+00	1.4E-05
VOC	Trichloroethene	79-01-6	1.3E+02	1.0E+00	1.8E-02	7.9E-02	5.7E-01	3.9E-01	3.5E-01	1.4E+00	3.7E-05
VOC	Trichlorofluoromethane	75-69-4	1.4E+02	1.0E+00	1.3E-02	5.7E-02	6.2E-01	3.7E-01	3.4E-01	1.5E+00	2.7E-05
VOC	1,2,3-Trichloropropane	96-18-4	1.5E+02	1.0E+00	4.8E-03	2.2E-02	7.0E-01	3.5E-01	3.2E-01	1.7E+00	1.1E-05
VOC	Vinyl Acetate	108-05-4	8.6E+01	1.0E+00	1.6E-03	5.7E-03	3.2E-01	3.4E-01	3.1E-01	7.7E-01	2.6E-06
VOC	Vinyl Chloride	75-01-4	6.3E+01	1.0E+00	6.9E-03	2.1E-02	2.4E-01	3.5E-01	3.2E-01	5.7E-01	1.0E-05
VOC	Xylenes (total)	1330-20-7	1.1E+02	1.0E+00	5.0E-02	2.0E-01	4.1E-01	4.8E-01	4.4E-01	9.9E-01	9.0E-05
SVOC	Acenaphthene	83-32-9	1.5E+02	1.0E+00	8.4E-02	4.0E-01	7.7E-01	6.4E-01	6.1E-01	1.8E+00	2.0E-04
SVOC	Acenaphthylene	208-96-8	1.5E+02	1.0E+00	8.9E-02	4.2E-01	7.5E-01	6.6E-01	6.3E-01	1.8E+00	2.1E-04
SVOC	Acetophenone	98-86-2	1.2E+02	1.0E+00	3.7E-03	1.6E-02	5.0E-01	3.4E-01	3.1E-01	1.2E+00	7.2E-06
SVOC	2-Acetylaminofluorene	53-96-3	2.2E+02	1.0E+00	1.3E-02	7.5E-02	1.9E+00	3.8E-01	3.5E-01	4.5E+00	4.9E-05
SVOC	4-Aminobiphenyl	92-67-1	1.7E+02	1.0E+00	1.2E-02	6.1E-02	9.3E-01	3.8E-01	3.4E-01	2.2E+00	3.3E-05
SVOC	Aniline	62-53-3	9.3E+01	1.0E+00	1.9E-03	7.0E-03	3.5E-01	3.4E-01	3.1E-01	8.4E-01	3.2E-06
SVOC	Anthracene	120-12-7	1.8E+02	1.0E+00	1.6E-01	8.2E-01	1.0E+00	1.0E+00	1.1E+00	4.0E+00	4.5E-04
SVOC	Aramite (total)	140-57-8	3.3E+02	1.0E+00	6.0E-01	4.2E+00	7.9E+00	4.3E+00	1.3E+01	3.4E+01	4.6E-03
SVOC	Benzo(a)anthracene	56-55-3	2.3E+02	9.0E-01	4.8E-01	2.8E+00	2.0E+00	2.9E+00	6.3E+00	8.4E+00	1.7E-03
SVOC	Benzo(a)pyrene	50-32-8	2.5E+02	8.0E-01	6.6E-01	4.0E+00	2.7E+00	4.1E+00	1.2E+01	1.2E+01	2.4E-03
SVOC	Benzo(b)fluoranthene	205-99-2	2.5E+02	8.0E-01	7.6E-01	4.6E+00	2.7E+00	4.7E+00	1.5E+01	1.2E+01	2.8E-03
SVOC	Benzo(g,h,i)perylene	191-24-2	2.8E+02	7.0E-01	1.0E+00	6.4E+00	3.7E+00	6.4E+00	2.8E+01	1.6E+01	3.7E-03
SVOC	Benzo(k)fluoranthene	207-08-9	2.5E+02	8.0E-01	7.6E-01	4.6E+00	2.7E+00	4.7E+00	1.5E+01	1.2E+01	2.8E-03
SVOC	Benzyl Alcohol	100-51-6	1.1E+02	1.0E+00	2.1E-03	8.4E-03	4.2E-01	3.4E-01	3.1E-01	1.0E+00	3.8E-06
SVOC	bis(2-Chloroethoxy)methane	111-91-1	1.7E+02	1.0E+00	1.2E-03	5.8E-03	9.8E-01	3.4E-01	3.1E-01	2.3E+00	3.2E-06
SVOC	bis(2-Chloroethyl) ether	111-44-4	1.4E+02	1.0E+00	1.6E-03	7.3E-03	6.6E-01	3.4E-01	3.1E-01	1.6E+00	3.6E-06
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	3.9E+02	4.0E-01	6.8E-01	5.1E+00	1.6E+01	5.2E+00	1.9E+01	7.1E+01	3.0E-03
SVOC	4-Bromophenyl-phenyl ether	101-55-3	2.5E+02	1.0E+00	4.3E-02	2.6E-01	2.6E+00	5.2E-01	4.9E-01	6.3E+00	1.9E-04
SVOC	2-sec-Butyl-4,6-dinitrophenol	88-85-7	2.4E+02	1.0E+00	2.0E-02	1.2E-01	2.3E+00	4.1E-01	3.8E-01	5.6E+00	8.2E-05
SVOC	Butylbenzylphthalate	85-68-7	3.1E+02	9.0E-01	4.4E-02	3.0E-01	5.9E+00	5.6E-01	5.2E-01	1.4E+01	2.7E-04

Attachment A3: Nonsteady-State Dermal Absorption from Water
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	MW (g/mole)	FA (unitless)	K_p (cm/hr)	B (unitless)	τ (hr)	c	b	ts (hr)	DA (L/cm^2-event)
SVOC	4-Chloro-3-methylphenol	59-50-7	1.4E+02	1.0E+00	2.8E-02	1.3E-01	6.6E-01	4.2E-01	3.9E-01	1.6E+00	6.3E-05
SVOC	4-Chloroaniline	106-47-8	1.3E+02	1.0E+00	5.1E-03	2.2E-02	5.4E-01	3.5E-01	3.2E-01	1.3E+00	1.0E-05
SVOC	p-Chlorobenzilate	510-15-6	3.3E+02	1.0E+00	1.8E-02	1.3E-01	7.0E+00	4.2E-01	3.8E-01	1.7E+01	1.3E-04
SVOC	2-Chloronaphthalene	91-58-7	1.6E+02	1.0E+00	1.0E-01	5.0E-01	8.6E-01	7.2E-01	7.1E-01	2.1E+00	2.6E-04
SVOC	2-Chlorophenol	95-57-8	1.3E+02	1.0E+00	7.9E-03	3.5E-02	5.5E-01	3.6E-01	3.2E-01	1.3E+00	1.6E-05
SVOC	4-Chlorophenyl-phenyl ether	7005-72-3	2.0E+02	1.0E+00	5.6E-02	3.1E-01	1.5E+00	5.6E-01	5.3E-01	3.5E+00	1.9E-04
SVOC	Chrysene	218-01-9	2.3E+02	9.0E-01	4.8E-01	2.8E+00	2.0E+00	2.9E+00	6.3E+00	8.4E+00	1.7E-03
SVOC	Diallate (total)	2303-16-4	2.7E+02	1.0E+00	1.0E+00	6.3E+00	3.4E+00	6.4E+00	2.8E+01	1.5E+01	5.1E-03
SVOC	Dibenz(a,h)anthracene	53-70-3	2.8E+02	7.0E-01	1.0E+00	6.4E+00	3.8E+00	6.5E+00	2.9E+01	1.7E+01	3.8E-03
SVOC	Dibenzofuran	132-64-9	1.7E+02	1.0E+00	1.4E-01	7.1E-01	9.2E-01	9.1E-01	9.6E-01	3.6E+00	3.8E-04
SVOC	3,3'-Dichlorobenzidine	91-94-1	2.5E+02	1.0E+00	1.3E-02	7.7E-02	2.8E+00	3.9E-01	3.5E-01	6.6E+00	5.8E-05
SVOC	2,4-Dichlorophenol	120-83-2	1.6E+02	1.0E+00	2.1E-02	1.0E-01	8.6E-01	4.0E-01	3.7E-01	2.1E+00	5.4E-05
SVOC	2,6-Dichlorophenol	87-65-0	1.6E+02	1.0E+00	1.5E-02	7.6E-02	8.6E-01	3.9E-01	3.5E-01	2.1E+00	4.0E-05
SVOC	Diethylphthalate	84-66-2	2.2E+02	1.0E+00	4.0E-03	2.3E-02	1.8E+00	3.5E-01	3.2E-01	4.4E+00	1.5E-05
SVOC	Dimethoate	60-51-5	2.3E+02	1.0E+00	5.1E-03	3.0E-02	2.0E+00	3.5E-01	3.2E-01	4.9E+00	2.0E-05
SVOC	p-(Dimethylamino)azobenzene	60-11-7	2.3E+02	1.0E+00	9.1E-02	5.3E-01	1.9E+00	7.5E-01	7.4E-01	4.6E+00	3.5E-04
SVOC	7,12-Dimethylbenz(a)anthracene	57-97-6	2.6E+02	1.0E+00	3.9E-01	2.4E+00	2.9E+00	2.5E+00	4.9E+00	1.2E+01	1.8E-03
SVOC	3,3'-Dimethylbenzidine	119-93-7	2.1E+02	1.0E+00	3.6E-03	2.0E-02	1.6E+00	3.5E-01	3.2E-01	3.9E+00	1.3E-05
SVOC	a,a-Dimethylphenethylamine	122-09-8	1.5E+02	1.0E+00	4.2E-03	2.0E-02	7.2E-01	3.5E-01	3.2E-01	1.7E+00	9.7E-06
SVOC	2,4-Dimethylphenol	105-67-9	1.2E+02	1.0E+00	1.2E-02	5.0E-02	5.1E-01	3.7E-01	3.3E-01	1.2E+00	2.3E-05
SVOC	Dimethylphthalate	131-11-3	1.9E+02	1.0E+00	2.2E-03	1.2E-02	1.3E+00	3.4E-01	3.1E-01	3.1E+00	7.0E-06
SVOC	Di-n-butylphthalate	84-74-2	2.8E+02	9.0E-01	4.8E-02	3.1E-01	3.8E+00	5.6E-01	5.3E-01	9.1E+00	2.3E-04
SVOC	4,6-Dinitro-2-methylphenol	534-52-1	2.0E+02	1.0E+00	3.1E-03	1.7E-02	1.4E+00	3.4E-01	3.1E-01	3.2E+00	9.9E-06
SVOC	1,3-Dinitrobenzene	99-65-0	1.7E+02	1.0E+00	1.7E-03	8.7E-03	9.2E-01	3.4E-01	3.1E-01	2.2E+00	4.6E-06
SVOC	2,4-Dinitrophenol	51-28-5	1.8E+02	1.0E+00	1.6E-03	8.1E-03	1.1E+00	3.4E-01	3.1E-01	2.7E+00	4.6E-06
SVOC	2,4-Dinitrotoluene	121-14-2	1.8E+02	1.0E+00	3.2E-03	1.7E-02	1.1E+00	3.4E-01	3.1E-01	2.6E+00	9.3E-06
SVOC	2,6-Dinitrotoluene	606-20-2	1.8E+02	1.0E+00	2.6E-03	1.3E-02	1.1E+00	3.4E-01	3.1E-01	2.6E+00	7.5E-06
SVOC	Di-n-octylphthalate	117-84-0	3.9E+02	3.0E-01	1.0E+00	7.6E+00	1.6E+01	7.6E+00	3.9E+01	7.2E+01	3.3E-03
SVOC	Diphenylamine	122-39-4	1.7E+02	1.0E+00	2.4E-02	1.2E-01	9.3E-01	4.2E-01	3.8E-01	2.2E+00	6.4E-05
SVOC	Disulfoton	298-04-4	2.7E+02	1.0E+00	1.8E-02	1.2E-01	3.6E+00	4.2E-01	3.8E-01	8.7E+00	9.6E-05
SVOC	Ethylmethanesulfonate	62-50-0	1.2E+02	1.0E+00	3.5E-04	1.5E-03	5.2E-01	3.3E-01	3.0E-01	1.3E+00	6.9E-07
SVOC	Famphur	52-85-7	3.3E+02	1.0E+00	7.1E-04	4.9E-03	7.0E+00	3.4E-01	3.1E-01	1.7E+01	5.2E-06
SVOC	Fluoranthene	206-44-0	2.0E+02	1.0E+00	2.8E-01	1.5E+00	1.4E+00	1.7E+00	2.4E+00	5.7E+00	9.2E-04
SVOC	Fluorene	86-73-7	1.7E+02	1.0E+00	1.1E-01	5.5E-01	9.0E-01	7.7E-01	7.7E-01	2.2E+00	2.9E-04
SVOC	Hexachlorobenzene	118-74-1	2.8E+02	8.0E-01	3.1E-01	2.0E+00	4.1E+00	2.1E+00	3.7E+00	1.7E+01	1.4E-03
SVOC	Hexachlorobutadiene	87-68-3	2.6E+02	9.0E-01	8.2E-02	5.1E-01	3.0E+00	7.3E-01	7.2E-01	7.3E+00	3.6E-04
SVOC	Hexachlorocyclopentadiene	77-47-4	2.7E+02	9.0E-01	1.7E-01	1.1E+00	3.5E+00	1.2E+00	1.5E+00	1.4E+01	7.9E-04
SVOC	Hexachloroethane	67-72-1	2.4E+02	1.0E+00	3.3E-02	1.9E-01	2.2E+00	4.7E-01	4.3E-01	5.3E+00	1.3E-04
SVOC	Hexachloropropene	1888-71-7	2.5E+02	1.0E+00	5.0E-02	3.0E-01	2.6E+00	5.6E-01	5.2E-01	6.2E+00	2.2E-04

Attachment A3: Nonsteady-State Dermal Absorption from Water
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	MW (g/mole)	FA (unitless)	K_p (cm/hr)	B (unitless)	τ (hr)	c	b	ts (hr)	DA (L/cm^2-event)
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	2.8E+02	7.0E-01	1.0E+00	6.4E+00	3.7E+00	6.4E+00	2.8E+01	1.6E+01	3.7E-03
SVOC	Isophorone	78-59-1	1.4E+02	1.0E+00	3.5E-03	1.6E-02	6.2E-01	3.4E-01	3.1E-01	1.5E+00	7.7E-06
SVOC	Isosafrole (total)	120-58-1	1.6E+02	1.0E+00	1.1E-02	5.5E-02	8.5E-01	3.7E-01	3.4E-01	2.0E+00	2.8E-05
SVOC	Methapyrilene	91-80-5	2.6E+02	1.0E+00	3.5E-03	2.2E-02	3.1E+00	3.5E-01	3.2E-01	7.3E+00	1.7E-05
SVOC	3-Methylcholanthrene	56-49-5	2.7E+02	1.0E+00	1.0E+00	6.3E+00	3.3E+00	6.3E+00	2.8E+01	1.5E+01	5.1E-03
SVOC	Methylmethanesulfonate	66-27-3	1.1E+02	1.0E+00	9.0E-05	3.6E-04	4.4E-01	3.3E-01	3.0E-01	1.0E+00	1.6E-07
SVOC	2-Methylnaphthalene	91-57-6	1.4E+02	1.0E+00	8.9E-02	4.1E-01	6.6E-01	6.5E-01	6.2E-01	1.6E+00	2.0E-04
SVOC	Methylphenol (total)	1319-77-3	1.1E+02	1.0E+00	7.3E-03	2.9E-02	4.2E-01	3.5E-01	3.2E-01	1.0E+00	1.3E-05
SVOC	Naphthalene	91-20-3	1.3E+02	1.0E+00	5.0E-02	2.2E-01	5.5E-01	4.9E-01	4.5E-01	1.3E+00	1.0E-04
SVOC	1,4-Naphthoquinone	130-15-4	1.6E+02	1.0E+00	1.5E-02	7.3E-02	8.1E-01	3.8E-01	3.5E-01	1.9E+00	3.7E-05
SVOC	1-Naphthylamine	134-32-7	1.4E+02	1.0E+00	7.3E-03	3.4E-02	6.7E-01	3.6E-01	3.2E-01	1.6E+00	1.6E-05
SVOC	2-Naphthylamine	91-59-8	1.4E+02	1.0E+00	7.6E-03	3.5E-02	6.7E-01	3.6E-01	3.3E-01	1.6E+00	1.7E-05
SVOC	2-Nitroaniline	88-74-4	1.4E+02	1.0E+00	4.4E-03	2.0E-02	6.2E-01	3.5E-01	3.2E-01	1.5E+00	9.7E-06
SVOC	3-Nitroaniline	99-09-2	1.4E+02	1.0E+00	2.1E-03	9.7E-03	6.2E-01	3.4E-01	3.1E-01	1.5E+00	4.7E-06
SVOC	4-Nitroaniline	100-01-6	1.4E+02	1.0E+00	2.2E-03	1.0E-02	6.2E-01	3.4E-01	3.1E-01	1.5E+00	4.8E-06
SVOC	Nitrobenzene	98-95-3	1.2E+02	1.0E+00	5.3E-03	2.3E-02	5.1E-01	3.5E-01	3.2E-01	1.2E+00	1.1E-05
SVOC	2-Nitrophenol	88-75-5	1.4E+02	1.0E+00	4.0E-03	1.8E-02	6.3E-01	3.5E-01	3.1E-01	1.5E+00	8.8E-06
SVOC	4-Nitrophenol	100-02-7	1.4E+02	1.0E+00	4.8E-03	2.2E-02	6.3E-01	3.5E-01	3.2E-01	1.5E+00	1.1E-05
SVOC	4-Nitroquinoline-1-oxide	56-57-5	1.9E+02	1.0E+00	7.2E-04	3.8E-03	1.2E+00	3.4E-01	3.1E-01	2.9E+00	2.2E-06
SVOC	N-Nitrosodi-n-butylamine	924-16-3	1.6E+02	1.0E+00	3.8E-03	1.8E-02	8.1E-01	3.5E-01	3.1E-01	1.9E+00	9.5E-06
SVOC	N-Nitrosodiethylamine	55-18-5	1.0E+02	1.0E+00	8.8E-04	3.4E-03	3.9E-01	3.4E-01	3.1E-01	9.4E-01	1.6E-06
SVOC	N-Nitrosodimethylamine	62-75-9	7.4E+01	1.0E+00	3.0E-04	9.9E-04	2.7E-01	3.3E-01	3.0E-01	6.6E-01	4.6E-07
SVOC	N-Nitrosodiphenylamine	86-30-6	2.0E+02	1.0E+00	1.5E-02	8.1E-02	1.4E+00	3.9E-01	3.5E-01	3.3E+00	4.8E-05
SVOC	N-Nitroso-di-n-propylamine	621-64-7	1.3E+02	1.0E+00	2.5E-03	1.1E-02	5.6E-01	3.4E-01	3.1E-01	1.4E+00	5.2E-06
SVOC	N-Nitrosomethylethylamine	10595-95-6	8.8E+01	1.0E+00	5.4E-04	2.0E-03	3.3E-01	3.3E-01	3.0E-01	7.9E-01	8.9E-07
SVOC	N-Nitrosopiperidine	100-75-4	1.1E+02	1.0E+00	6.3E-04	2.6E-03	4.6E-01	3.4E-01	3.0E-01	1.1E+00	1.2E-06
SVOC	N-Nitrosopyrrolidine	930-55-2	1.0E+02	1.0E+00	3.3E-04	1.3E-03	3.8E-01	3.3E-01	3.0E-01	9.2E-01	5.8E-07
SVOC	5-Nitro-o-toluidine	99-55-8	1.5E+02	1.0E+00	4.3E-03	2.1E-02	7.5E-01	3.5E-01	3.2E-01	1.8E+00	1.0E-05
SVOC	N-Nitrosomorpholine	59-89-2	1.2E+02	1.0E+00	1.8E-04	7.5E-04	4.7E-01	3.3E-01	3.0E-01	1.1E+00	3.4E-07
SVOC	2,2'-oxybis(1-Chloropropane)	108-60-1	1.7E+02	1.0E+00	7.2E-03	3.6E-02	9.5E-01	3.6E-01	3.3E-01	2.3E+00	2.0E-05
SVOC	Pentachlorobenzene	608-93-5	2.5E+02	1.0E+00	1.6E-01	9.9E-01	2.7E+00	1.2E+00	1.4E+00	1.0E+01	7.3E-04
SVOC	Pentachloronitrobenzene	82-68-8	3.0E+02	9.0E-01	4.1E-02	2.7E-01	4.7E+00	5.3E-01	4.9E-01	1.1E+01	2.2E-04
SVOC	Pentachlorophenol	87-86-5	2.7E+02	9.0E-01	1.2E-01	7.3E-01	3.3E+00	9.3E-01	9.9E-01	1.3E+01	5.3E-04
SVOC	Phenacetin	62-44-2	1.8E+02	1.0E+00	1.7E-03	8.9E-03	1.1E+00	3.4E-01	3.1E-01	2.5E+00	4.9E-06
SVOC	Phenanthrene	85-01-8	1.8E+02	1.0E+00	1.4E-01	7.2E-01	1.0E+00	9.1E-01	9.7E-01	4.1E+00	4.0E-04
SVOC	Phenol	108-95-2	9.4E+01	1.0E+00	4.5E-03	1.7E-02	3.5E-01	3.4E-01	3.1E-01	8.5E-01	7.6E-06
SVOC	p-Phenylene diamine	106-50-3	1.1E+02	1.0E+00	2.6E-04	1.1E-03	4.2E-01	3.3E-01	3.0E-01	1.0E+00	4.8E-07
SVOC	Phorate	298-02-2	2.6E+02	1.0E+00	1.2E-02	7.7E-02	3.0E+00	3.9E-01	3.5E-01	7.2E+00	5.9E-05
SVOC	2-Picoline	109-06-8	9.3E+01	1.0E+00	2.4E-03	8.9E-03	3.5E-01	3.4E-01	3.1E-01	8.4E-01	4.1E-06

Attachment A3: Nonsteady-State Dermal Absorption from Water Bway Corporation, Cincinnati, Ohio											
Chem Group	**Chemical**	**CASRN**	**MW** (g/mole)	**FA** (unitless)	**K_p** (cm/hr)	**B** (unitless)	**τ** (hr)	**c**	**b**	**ts** (hr)	**DA** (L/cm^2-event)
SVOC	Pronamide	23950-58-5	2.6E+02	1.0E+00	1.1E-02	6.6E-02	2.9E+00	3.8E-01	3.4E-01	6.9E+00	5.0E-05
SVOC	Pyrene	129-00-0	2.0E+02	1.0E+00	2.8E-01	1.5E+00	1.4E+00	1.6E+00	2.4E+00	5.7E+00	9.1E-04
SVOC	Pyridine	110-86-1	7.9E+01	1.0E+00	1.5E-03	5.2E-03	2.9E-01	3.4E-01	3.1E-01	7.0E-01	2.4E-06
SVOC	Safrole (total)	94-59-7	1.6E+02	1.0E+00	1.1E-02	5.5E-02	8.5E-01	3.7E-01	3.4E-01	2.0E+00	2.8E-05
SVOC	Sulfotepp	3689-24-5	3.2E+02	1.0E+00	8.4E-03	5.8E-02	6.7E+00	3.7E-01	3.4E-01	1.6E+01	6.0E-05
SVOC	1,2,4,5-Tetrachlorobenzene	95-94-3	2.2E+02	1.0E+00	9.3E-02	5.2E-01	1.7E+00	7.4E-01	7.4E-01	4.1E+00	3.3E-04
SVOC	2,3,4,6-Tetrachlorophenol	58-90-2	2.3E+02	1.0E+00	6.9E-02	4.0E-01	2.1E+00	6.4E-01	6.1E-01	5.0E+00	2.8E-04
SVOC	Thionazin	297-97-2	2.5E+02	1.0E+00	1.1E-03	6.6E-03	2.6E+00	3.4E-01	3.1E-01	6.2E+00	4.8E-06
SVOC	o-Toluidine	95-53-4	1.1E+02	1.0E+00	2.8E-03	1.1E-02	4.2E-01	3.4E-01	3.1E-01	1.0E+00	5.1E-06
SVOC	2,4,5-Trichlorophenol	95-95-4	2.0E+02	1.0E+00	4.7E-02	2.5E-01	1.3E+00	5.2E-01	4.8E-01	3.2E+00	1.5E-04
SVOC	2,4,6-Trichlorophenol	88-06-2	2.0E+02	1.0E+00	3.4E-02	1.9E-01	1.3E+00	4.7E-01	4.3E-01	3.2E+00	1.1E-04
SVOC	O,O,O-Triethyl phosphorothioate	126-68-1	2.0E+02	1.0E+00							
SVOC	1,3,5-Trinitrobenzene	99-35-4	2.1E+02	1.0E+00	6.1E-04	3.4E-03	1.6E+00	3.4E-01	3.1E-01	3.9E+00	2.2E-06
INORG	Aluminum	7429-90-5	2.7E+01		1.0E-03		1.5E-01	3.3E-01	3.0E-01	3.6E-01	1.0E-06
INORG	Antimony	7440-36-0	1.2E+02		1.0E-03		5.1E-01	3.3E-01	3.0E-01	1.2E+00	1.0E-06
INORG	Arsenic	7440-38-2	7.5E+01		1.0E-03		2.8E-01	3.3E-01	3.0E-01	6.6E-01	1.0E-06
INORG	Barium	7440-39-3	1.4E+02		1.0E-03		6.2E-01	3.3E-01	3.0E-01	1.5E+00	1.0E-06
INORG	Beryllium	7440-41-7	9.0E+00		1.0E-03		1.2E-01	3.3E-01	3.0E-01	2.8E-01	1.0E-06
INORG	Cadmium	7440-43-9	1.1E+02		1.0E-03		4.5E-01	3.3E-01	3.0E-01	1.1E+00	1.0E-06
INORG	Chromium (total)	7440-47-3	5.2E+01		2.0E-03		2.1E-01	3.3E-01	3.0E-01	4.9E-01	2.0E-06
INORG	Chromium III	16065-83-1	5.2E+01		1.0E-03		2.1E-01	3.3E-01	3.0E-01	4.9E-01	1.0E-06
INORG	Chromium VI	18540-29-9	5.2E+01		2.0E-03		2.1E-01	3.3E-01	3.0E-01	4.9E-01	2.0E-06
INORG	Cobalt	7440-48-4	5.9E+01		4.0E-04		2.2E-01	3.3E-01	3.0E-01	5.4E-01	4.0E-07
INORG	Copper	7440-50-8	6.4E+01		1.0E-03		2.4E-01	3.3E-01	3.0E-01	5.7E-01	1.0E-06
INORG	Iron	7439-89-6	5.6E+01		1.0E-03		2.2E-01	3.3E-01	3.0E-01	5.2E-01	1.0E-06
INORG	Manganese	7439-96-5	5.5E+01		1.0E-03		2.1E-01	3.3E-01	3.0E-01	5.1E-01	1.0E-06
INORG	Mercury	7439-97-6	2.0E+02		1.0E-03		1.4E+00	3.3E-01	3.0E-01	3.4E+00	1.0E-06
INORG	Nickel	7440-02-0	5.9E+01		2.0E-04		2.2E-01	3.3E-01	3.0E-01	5.4E-01	2.0E-07
INORG	Selenium	7782-49-2	7.9E+01		1.0E-03		2.9E-01	3.3E-01	3.0E-01	7.0E-01	1.0E-06
INORG	Silver	7440-22-4	1.1E+02		6.0E-04		4.2E-01	3.3E-01	3.0E-01	1.0E+00	6.0E-07
INORG	Thallium	7440-28-0	2.0E+02		1.0E-03		1.5E+00	3.3E-01	3.0E-01	3.5E+00	1.0E-06
INORG	Vanadium	7440-62-2	5.1E+01		1.0E-03		2.0E-01	3.3E-01	3.0E-01	4.9E-01	1.0E-06
INORG	Zinc	7440-66-6	6.5E+01		6.0E-04		2.4E-01	3.3E-01	3.0E-01	5.9E-01	6.0E-07
	Notes:										
	Event Time	hours	**t**	1							
	K_p is the K_p for water divided by the K_{ow}.										
	K_p capped at 1 cm/hr (USEPA 1992).										

Attachment A3: Normalized Vapor Flux to Ambient Air from Surface Water for Trespassers
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	H (unitless)	MW (g/mol)	k_G (cm/s)	k_L (cm/s)	$1/K_L$ (s/cm)	K_L (cm/s)	J_L (L/m^2-s)
VOC	Acetone	67-64-1	1.1E-03	5.8E+01	5.4E-01	1.4E-03	2.4E+03	4.1E-04	4.1E-03
VOC	Acetonitrile	75-05-8	1.1E-03	4.1E+01	6.1E-01	1.7E-03	2.0E+03	4.9E-04	4.9E-03
VOC	Acrolein	107-02-8	4.1E-03	5.6E+01	5.5E-01	1.5E-03	1.1E+03	8.9E-04	8.9E-03
VOC	Acrylonitrile	107-13-1	3.3E-03	5.3E+01	5.6E-01	1.5E-03	1.2E+03	8.3E-04	8.3E-03
VOC	Benzene	71-43-2	1.5E-01	7.8E+01	4.9E-01	1.2E-03	8.2E+02	1.2E-03	1.2E-02
VOC	Bromodichloromethane	75-27-4	4.1E-02	1.6E+02	3.8E-01	8.5E-04	1.2E+03	8.1E-04	8.1E-03
VOC	Bromoform	75-25-2	1.2E-02	2.5E+02	3.3E-01	6.9E-04	1.7E+03	5.9E-04	5.9E-03
VOC	Bromomethane	74-83-9	1.9E-01	9.5E+01	4.6E-01	1.1E-03	9.0E+02	1.1E-03	1.1E-02
VOC	2-Butanone	78-93-3	1.8E-03	7.2E+01	5.1E-01	1.3E-03	1.9E+03	5.4E-04	5.4E-03
VOC	Carbon Disulfide	75-15-0	8.7E-01	7.6E+01	5.0E-01	1.3E-03	8.0E+02	1.2E-03	1.2E-02
VOC	Carbon Tetrachloride	56-23-5	8.2E-01	1.5E+02	3.9E-01	8.8E-04	1.1E+03	8.8E-04	8.8E-03
VOC	2-Chloro-1,3-butadiene	126-99-8	1.0E+00	8.9E+01	4.7E-01	1.2E-03	8.6E+02	1.2E-03	1.2E-02
VOC	3-Chloro-1-propene	107-05-1	2.9E-01	7.7E+01	5.0E-01	1.2E-03	8.1E+02	1.2E-03	1.2E-02
VOC	Chlorobenzene	108-90-7	8.9E-02	1.1E+02	4.4E-01	1.0E-03	1.0E+03	1.0E-03	1.0E-02
VOC	Chloroethane	75-00-3	3.1E-01	6.5E+01	5.2E-01	1.4E-03	7.4E+02	1.3E-03	1.3E-02
VOC	Chloroform	67-66-3	1.0E-01	1.2E+02	4.3E-01	1.0E-03	1.0E+03	9.8E-04	9.8E-03
VOC	Chloromethane	74-87-3	3.2E-01	5.0E+01	5.7E-01	1.5E-03	6.6E+02	1.5E-03	1.5E-02
VOC	1,2-Dibromo-3-chloropropane	96-12-8	3.9E-03	2.4E+02	3.4E-01	7.1E-04	2.2E+03	4.6E-04	4.6E-03
VOC	Dibromochloromethane	124-48-1	2.2E-02	2.1E+02	3.5E-01	7.6E-04	1.4E+03	6.9E-04	6.9E-03
VOC	1,2-Dibromoethane	106-93-4	2.3E-02	1.9E+02	3.7E-01	8.0E-04	1.4E+03	7.3E-04	7.3E-03
VOC	Dibromomethane	74-95-3	2.8E-02	1.7E+02	3.8E-01	8.3E-04	1.3E+03	7.7E-04	7.7E-03
VOC	trans-1,4-Dichloro-2-butene	110-57-6	2.3E-03	1.3E+02	4.2E-01	9.8E-04	2.1E+03	4.9E-04	4.9E-03
VOC	1,2-Dichlorobenzene	95-50-1	4.1E-02	1.5E+02	4.0E-01	9.0E-04	1.2E+03	8.5E-04	8.5E-03
VOC	1,3-Dichlorobenzene	541-73-1	9.3E-02	1.5E+02	4.0E-01	9.0E-04	1.1E+03	8.8E-04	8.8E-03
VOC	1,4-Dichlorobenzene	106-46-7	5.4E-02	1.5E+02	4.0E-01	9.0E-04	1.2E+03	8.7E-04	8.7E-03
VOC	Dichlorodifluoromethane	75-71-8	1.1E+01	1.2E+02	4.3E-01	9.9E-04	1.0E+03	9.9E-04	9.9E-03
VOC	1,1-Dichloroethane	75-34-3	1.5E-01	9.9E+01	4.5E-01	1.1E-03	9.2E+02	1.1E-03	1.1E-02
VOC	1,2-Dichloroethane	107-06-2	2.5E-02	9.9E+01	4.5E-01	1.1E-03	1.0E+03	1.0E-03	1.0E-02
VOC	1,1-Dichloroethene	75-35-4	7.6E-01	9.7E+01	4.6E-01	1.1E-03	9.0E+02	1.1E-03	1.1E-02
VOC	trans-1,2-Dichloroethene	156-60-5	2.6E-01	9.7E+01	4.6E-01	1.1E-03	9.1E+02	1.1E-03	1.1E-02
VOC	1,2-Dichloropropane	78-87-5	7.2E-02	1.1E+02	4.4E-01	1.0E-03	1.0E+03	1.0E-03	1.0E-02
VOC	1,3-Dichloropropene (total)	542-75-6	4.4E-01	1.1E+02	4.4E-01	1.0E-03	9.7E+02	1.0E-03	1.0E-02
VOC	1,4-Dioxane	123-91-1	1.3E-04	8.8E+01	4.7E-01	1.2E-03	1.8E+04	5.7E-05	5.7E-04
VOC	Ethyl Benzene	100-41-4	1.8E-01	1.1E+02	4.4E-01	1.1E-03	9.5E+02	1.0E-03	1.0E-02
VOC	Ethyl Methacrylate	97-63-2	2.4E-02	1.1E+02	4.3E-01	1.0E-03	1.1E+03	9.3E-04	9.3E-03

Attachment A3: Normalized Vapor Flux to Ambient Air from Surface Water for Trespassers
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	H (unitless)	MW (g/mol)	k_G (cm/s)	k_L (cm/s)	$1/K_L$ (s/cm)	K_L (cm/s)	J_L (L/m^2-s)
VOC	2-Hexanone	591-78-6	2.4E-03	1.0E+02	4.5E-01	1.1E-03	1.8E+03	5.5E-04	5.5E-03
VOC	Iodomethane	74-88-4	1.4E-01	1.4E+02	4.0E-01	9.2E-04	1.1E+03	9.0E-04	9.0E-03
VOC	Isobutyl Alcohol	78-83-1	3.3E-04	7.4E+01	5.0E-01	1.3E-03	6.8E+03	1.5E-04	1.5E-03
VOC	Methacrylonitrile	126-98-7	8.0E-03	6.7E+01	5.2E-01	1.3E-03	9.9E+02	1.0E-03	1.0E-02
VOC	4-Methyl-2-pentanone	108-10-1	4.3E-03	1.0E+02	4.5E-01	1.1E-03	1.4E+03	7.0E-04	7.0E-03
VOC	Methylene Chloride	75-09-2	6.2E-02	8.5E+01	4.8E-01	1.2E-03	8.8E+02	1.1E-03	1.1E-02
VOC	Methylmethacrylate	80-62-6	1.0E-02	1.0E+02	4.5E-01	1.1E-03	1.1E+03	8.9E-04	8.9E-03
VOC	Pentachloroethane	76-01-7	5.1E-02	2.0E+02	3.6E-01	7.7E-04	1.4E+03	7.4E-04	7.4E-03
VOC	Propionitrile	107-12-0	1.5E-03	5.5E+01	5.5E-01	1.5E-03	1.8E+03	5.4E-04	5.4E-03
VOC	Styrene	100-42-5	6.4E-02	1.0E+02	4.5E-01	1.1E-03	9.7E+02	1.0E-03	1.0E-02
VOC	1,1,1,2-Tetrachloroethane	630-20-6	7.2E-02	1.7E+02	3.8E-01	8.4E-04	1.2E+03	8.2E-04	8.2E-03
VOC	1,1,2,2-Tetrachloroethane	79-34-5	7.9E-03	1.7E+02	3.8E-01	8.4E-04	1.5E+03	6.6E-04	6.6E-03
VOC	Tetrachloroethene	127-18-4	4.5E-01	1.7E+02	3.8E-01	8.5E-04	1.2E+03	8.4E-04	8.4E-03
VOC	Toluene	108-88-3	1.7E-01	9.2E+01	4.7E-01	1.1E-03	8.9E+02	1.1E-03	1.1E-02
VOC	1,2,4-Trichlorobenzene	120-82-1	2.8E-02	1.8E+02	3.7E-01	8.1E-04	1.3E+03	7.5E-04	7.5E-03
VOC	1,1,1-Trichloroethane	71-55-6	4.6E-01	1.3E+02	4.1E-01	9.5E-04	1.1E+03	9.4E-04	9.4E-03
VOC	1,1,2-Trichloroethane	79-00-5	2.2E-02	1.3E+02	4.1E-01	9.5E-04	1.2E+03	8.6E-04	8.6E-03
VOC	Trichloroethene	79-01-6	2.7E-01	1.3E+02	4.1E-01	9.5E-04	1.1E+03	9.5E-04	9.5E-03
VOC	Trichlorofluoromethane	75-69-4	3.4E+00	1.4E+02	4.1E-01	9.3E-04	1.1E+03	9.3E-04	9.3E-03
VOC	1,2,3-Trichloropropane	96-18-4	1.2E-02	1.5E+02	4.0E-01	9.0E-04	1.3E+03	7.6E-04	7.6E-03
VOC	Vinyl Acetate	108-05-4	1.3E-02	8.6E+01	4.8E-01	1.2E-03	1.0E+03	9.9E-04	9.9E-03
VOC	Vinyl Chloride	75-01-4	8.6E-01	6.3E+01	5.3E-01	1.4E-03	7.3E+02	1.4E-03	1.4E-02
VOC	Xylenes (total)	1330-20-7	1.6E-01	1.1E+02	4.4E-01	1.1E-03	9.6E+02	1.0E-03	1.0E-02
SVOC	Acenaphthene	83-32-9	2.6E-03	1.5E+02	3.9E-01	8.8E-04	2.1E+03	4.7E-04	4.7E-03
SVOC	Acenaphthylene	208-96-8	1.3E-03	1.5E+02	3.9E-01	8.9E-04	3.1E+03	3.2E-04	3.2E-03
SVOC	Acetophenone	98-86-2	2.9E-04	1.2E+02	4.3E-01	1.0E-03	9.2E+03	1.1E-04	1.1E-03
SVOC	2-Acetylaminofluorene	53-96-3	3.5E-05	2.2E+02	3.5E-01	7.3E-04	8.4E+04	1.2E-05	1.2E-04
SVOC	4-Aminobiphenyl	92-67-1	4.4E-09	1.7E+02	3.8E-01	8.4E-04	6.0E+08	1.7E-09	1.7E-08
SVOC	Aniline	62-53-3	2.1E-05	9.3E+01	4.6E-01	1.1E-03	1.0E+05	9.8E-06	9.8E-05
SVOC	Anthracene	120-12-7	9.5E-04	1.8E+02	3.7E-01	8.2E-04	4.1E+03	2.5E-04	2.5E-03
SVOC	Aramite (total)	140-57-8	2.1E-05	3.3E+02	3.0E-01	6.0E-04	1.6E+05	6.4E-06	6.4E-05
SVOC	Benzo(a)anthracene	56-55-3	3.7E-05	2.3E+02	3.4E-01	7.2E-04	8.0E+04	1.3E-05	1.3E-04
SVOC	Benzo(a)pyrene	50-32-8	9.0E-06	2.5E+02	3.3E-01	6.9E-04	3.3E+05	3.0E-06	3.0E-05
SVOC	Benzo(b)fluoranthene	205-99-2	1.1E-03	2.5E+02	3.3E-01	6.9E-04	4.3E+03	2.3E-04	2.3E-03
SVOC	Benzo(g,h,i)perylene	191-24-2	1.6E-06	2.8E+02	3.2E-01	6.6E-04	2.0E+06	5.1E-07	5.1E-06

Attachment A3: Normalized Vapor Flux to Ambient Air from Surface Water for Trespassers Bway Corporation, Cincinnati, Ohio									
Chem Group	Chemical	CASRN	H (unitless)	MW (g/mol)	k_G (cm/s)	k_L (cm/s)	$1/K_L$ (s/cm)	K_L (cm/s)	J_L (L/m^2-s)
SVOC	Benzo(k)fluoranthene	207-08-9	7.1E-06	2.5E+02	3.3E-01	6.9E-04	4.2E+05	2.4E-06	2.4E-05
SVOC	Benzyl Alcohol	100-51-6	4.4E-06	1.1E+02	4.4E-01	1.1E-03	5.2E+05	1.9E-06	1.9E-05
SVOC	bis(2-Chloroethoxy)methane	111-91-1	1.9E-06	1.7E+02	3.8E-01	8.3E-04	1.4E+06	7.2E-07	7.2E-06
SVOC	bis(2-Chloroethyl) ether	111-44-4	3.5E-04	1.4E+02	4.0E-01	9.1E-04	8.3E+03	1.2E-04	1.2E-03
SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	9.1E-07	3.9E+02	2.9E-01	5.5E-04	3.8E+06	2.6E-07	2.6E-06
SVOC	4-Bromophenyl-phenyl ether	101-55-3	1.3E-03	2.5E+02	3.3E-01	6.9E-04	3.7E+03	2.7E-04	2.7E-03
SVOC	2-sec-Butyl-4,6-dinitrophenol	88-85-7	5.1E-06	2.4E+02	3.4E-01	7.1E-04	5.8E+05	1.7E-06	1.7E-05
SVOC	Butylbenzylphthalate	85-68-7	1.5E-05	3.1E+02	3.1E-01	6.2E-04	2.2E+05	4.5E-06	4.5E-05
SVOC	4-Chloro-3-methylphenol	59-50-7	4.5E-06	1.4E+02	4.0E-01	9.2E-04	5.5E+05	1.8E-06	1.8E-05
SVOC	4-Chloroaniline	106-47-8	5.9E-06	1.3E+02	4.2E-01	9.7E-04	4.1E+05	2.5E-06	2.5E-05
SVOC	p-Chlorobenzilate	510-15-6	8.1E-07	3.3E+02	3.1E-01	6.1E-04	4.0E+06	2.5E-07	2.5E-06
SVOC	2-Chloronaphthalene	91-58-7	3.5E-03	1.6E+02	3.9E-01	8.6E-04	1.9E+03	5.3E-04	5.3E-03
SVOC	2-Chlorophenol	95-57-8	8.4E-03	1.3E+02	4.2E-01	9.6E-04	1.3E+03	7.6E-04	7.6E-03
SVOC	4-Chlorophenyl-phenyl ether	7005-72-3	2.5E-03	2.0E+02	3.6E-01	7.6E-04	2.4E+03	4.1E-04	4.1E-03
SVOC	Chrysene	218-01-9	9.6E-04	2.3E+02	3.4E-01	7.2E-04	4.4E+03	2.3E-04	2.3E-03
SVOC	Diallate (total)	2303-16-4	4.3E-05	2.7E+02	3.2E-01	6.7E-04	7.4E+04	1.4E-05	1.4E-04
SVOC	Dibenz(a,h)anthracene	53-70-3	4.2E-08	2.8E+02	3.2E-01	6.6E-04	7.4E+07	1.4E-08	1.4E-07
SVOC	Dibenzofuran	132-64-9	3.9E-05	1.7E+02	3.8E-01	8.4E-04	6.9E+04	1.5E-05	1.5E-04
SVOC	3,3'-Dichlorobenzidine	91-94-1	3.2E-08	2.5E+02	3.3E-01	6.9E-04	9.5E+07	1.1E-08	1.1E-07
SVOC	2,4-Dichlorophenol	120-83-2	4.4E-05	1.6E+02	3.8E-01	8.6E-04	6.0E+04	1.7E-05	1.7E-04
SVOC	2,6-Dichlorophenol	87-65-0	4.5E-04	1.6E+02	3.8E-01	8.6E-04	6.9E+03	1.4E-04	1.4E-03
SVOC	Diethylphthalate	84-66-2	6.0E-06	2.2E+02	3.5E-01	7.3E-04	4.8E+05	2.1E-06	2.1E-05
SVOC	Dimethoate	60-51-5	6.9E-10	2.3E+02	3.4E-01	7.2E-04	4.2E+09	2.4E-10	2.4E-09
SVOC	p-(Dimethylamino)azobenzene	60-11-7	4.5E-09	2.3E+02	3.5E-01	7.3E-04	6.4E+08	1.6E-09	1.6E-08
SVOC	7,12-Dimethylbenz(a)anthracene	57-97-6	3.5E-07	2.6E+02	3.3E-01	6.8E-04	8.6E+06	1.2E-07	1.2E-06
SVOC	3,3'-Dimethylbenzidine	119-93-7	7.1E-10	2.1E+02	3.5E-01	7.5E-04	4.0E+09	2.5E-10	2.5E-09
SVOC	a,a-Dimethylphenethylamine	122-09-8	1.6E-05	1.5E+02	4.0E-01	9.0E-04	1.6E+05	6.3E-06	6.3E-05
SVOC	2,4-Dimethylphenol	105-67-9	3.6E-05	1.2E+02	4.2E-01	9.9E-04	6.6E+04	1.5E-05	1.5E-04
SVOC	Dimethylphthalate	131-11-3	1.2E-06	1.9E+02	3.6E-01	7.8E-04	2.3E+06	4.3E-07	4.3E-06
SVOC	Di-n-butylphthalate	84-74-2	1.1E-08	2.8E+02	3.2E-01	6.6E-04	2.9E+08	3.5E-09	3.5E-08
SVOC	4,6-Dinitro-2-methylphenol	534-52-1	4.8E-06	2.0E+02	3.6E-01	7.8E-04	5.8E+05	1.7E-06	1.7E-05
SVOC	1,3-Dinitrobenzene	99-65-0	2.6E-06	1.7E+02	3.8E-01	8.4E-04	1.0E+06	9.9E-07	9.9E-06
SVOC	2,4-Dinitrophenol	51-28-5	2.3E-06	1.8E+02	3.7E-01	8.1E-04	1.2E+06	8.5E-07	8.5E-06
SVOC	2,4-Dinitrotoluene	121-14-2	1.3E-06	1.8E+02	3.7E-01	8.1E-04	2.1E+06	4.8E-07	4.8E-06
SVOC	2,6-Dinitrotoluene	606-20-2	1.1E-05	1.8E+02	3.7E-01	8.1E-04	2.5E+05	4.0E-06	4.0E-05

Attachment A3: Normalized Vapor Flux to Ambient Air from Surface Water for Trespassers
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	H (unitless)	MW (g/mol)	k_G (cm/s)	k_L (cm/s)	$1/K_L$ (s/cm)	K_L (cm/s)	J_L (L/m^2-s)
SVOC	Di-n-octylphthalate	117-84-0	7.1E-04	3.9E+02	2.9E-01	5.5E-04	6.7E+03	1.5E-04	1.5E-03
SVOC	Diphenylamine	122-39-4	5.6E-06	1.7E+02	3.8E-01	8.4E-04	4.7E+05	2.1E-06	2.1E-05
SVOC	Disulfoton	298-04-4	4.5E-05	2.7E+02	3.2E-01	6.6E-04	7.0E+04	1.4E-05	1.4E-04
SVOC	Ethylmethanesulfonate	62-50-0	6.0E-05	1.2E+02	4.2E-01	9.8E-04	4.0E+04	2.5E-05	2.5E-04
SVOC	Famphur	52-85-7	1.8E-07	3.3E+02	3.1E-01	6.1E-04	1.8E+07	5.5E-08	5.5E-07
SVOC	Fluoranthene	206-44-0	2.1E-04	2.0E+02	3.6E-01	7.7E-04	1.5E+04	6.9E-05	6.9E-04
SVOC	Fluorene	86-73-7	1.0E-03	1.7E+02	3.8E-01	8.5E-04	3.7E+03	2.7E-04	2.7E-03
SVOC	Hexachlorobenzene	118-74-1	1.7E-02	2.8E+02	3.2E-01	6.5E-04	1.7E+03	5.8E-04	5.8E-03
SVOC	Hexachlorobutadiene	87-68-3	1.6E-01	2.6E+02	3.3E-01	6.8E-04	1.5E+03	6.7E-04	6.7E-03
SVOC	Hexachlorocyclopentadiene	77-47-4	5.0E-01	2.7E+02	3.2E-01	6.6E-04	1.5E+03	6.6E-04	6.6E-03
SVOC	Hexachloroethane	67-72-1	8.3E-02	2.4E+02	3.4E-01	7.1E-04	1.4E+03	6.9E-04	6.9E-03
SVOC	Hexachloropropene	1888-71-7	5.3E-02	2.5E+02	3.3E-01	6.9E-04	1.5E+03	6.7E-04	6.7E-03
SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	1.2E-05	2.8E+02	3.2E-01	6.6E-04	2.6E+05	3.9E-06	3.9E-05
SVOC	Isophorone	78-59-1	1.3E-04	1.4E+02	4.1E-01	9.3E-04	2.0E+04	5.0E-05	5.0E-04
SVOC	Isosafrole (total)	120-58-1	3.7E-11	1.6E+02	3.9E-01	8.6E-04	7.1E+10	1.4E-11	1.4E-10
SVOC	Methapyrilene	91-80-5	3.1E-06	2.6E+02	3.3E-01	6.8E-04	9.9E+05	1.0E-06	1.0E-05
SVOC	3-Methylcholanthrene	56-49-5	1.1E-05	2.7E+02	3.3E-01	6.7E-04	2.9E+05	3.4E-06	3.4E-05
SVOC	Methylmethanesulfonate	66-27-3	8.0E-09	1.1E+02	4.4E-01	1.0E-03	2.9E+08	3.5E-09	3.5E-08
SVOC	2-Methylnaphthalene	91-57-6	1.3E-02	1.4E+02	4.0E-01	9.2E-04	1.3E+03	7.8E-04	7.8E-03
SVOC	Methylphenol (total)	1319-77-3	8.9E-06	1.1E+02	4.4E-01	1.1E-03	2.6E+05	3.9E-06	3.9E-05
SVOC	Naphthalene	91-20-3	9.6E-03	1.3E+02	4.2E-01	9.7E-04	1.3E+03	7.8E-04	7.8E-03
SVOC	1,4-Naphthoquinone	130-15-4	2.6E-04	1.6E+02	3.9E-01	8.7E-04	1.1E+04	9.0E-05	9.0E-04
SVOC	1-Naphthylamine	134-32-7	1.4E-09	1.4E+02	4.0E-01	9.1E-04	1.7E+09	5.7E-10	5.7E-09
SVOC	2-Naphthylamine	91-59-8	6.8E-06	1.4E+02	4.0E-01	9.1E-04	3.7E+05	2.7E-06	2.7E-05
SVOC	2-Nitroaniline	88-74-4	1.8E-06	1.4E+02	4.1E-01	9.3E-04	1.4E+06	7.3E-07	7.3E-06
SVOC	3-Nitroaniline	99-09-2	1.6E-06	1.4E+02	4.1E-01	9.3E-04	1.5E+06	6.6E-07	6.6E-06
SVOC	4-Nitroaniline	100-01-6	2.3E-08	1.4E+02	4.1E-01	9.3E-04	1.1E+08	9.5E-09	9.5E-08
SVOC	Nitrobenzene	98-95-3	4.7E-04	1.2E+02	4.2E-01	9.9E-04	6.1E+03	1.6E-04	1.6E-03
SVOC	2-Nitrophenol	88-75-5	1.1E-04	1.4E+02	4.1E-01	9.3E-04	2.4E+04	4.1E-05	4.1E-04
SVOC	4-Nitrophenol	100-02-7	4.7E-09	1.4E+02	4.1E-01	9.3E-04	5.3E+08	1.9E-09	1.9E-08
SVOC	4-Nitroquinoline-1-oxide	56-57-5	3.1E-13	1.9E+02	3.7E-01	7.9E-04	8.9E+12	1.1E-13	1.1E-12
SVOC	N-Nitrosodi-n-butylamine	924-16-3	3.6E-03	1.6E+02	3.9E-01	8.7E-04	1.9E+03	5.3E-04	5.3E-03
SVOC	N-Nitrosodiethylamine	55-18-5	4.1E-05	1.0E+02	4.5E-01	1.1E-03	5.5E+04	1.8E-05	1.8E-04
SVOC	N-Nitrosodimethylamine	62-75-9	1.3E-05	7.4E+01	5.0E-01	1.3E-03	1.5E+05	6.7E-06	6.7E-05
SVOC	N-Nitrosodiphenylamine	86-30-6	1.2E-04	2.0E+02	3.6E-01	7.8E-04	2.5E+04	4.0E-05	4.0E-04

Attachment A3: Normalized Vapor Flux to Ambient Air from Surface Water for Trespassers
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	H (unitless)	MW (g/mol)	k_G (cm/s)	k_L (cm/s)	$1/K_L$ (s/cm)	K_L (cm/s)	J_L (L/m^2-s)
SVOC	N-Nitroso-di-n-propylamine	621-64-7	6.0E-05	1.3E+02	4.1E-01	9.6E-04	4.1E+04	2.4E-05	2.4E-04
SVOC	N-Nitrosomethylethylamine	10595-95-6	1.0E-05	8.8E+01	4.7E-01	1.2E-03	2.1E+05	4.7E-06	4.7E-05
SVOC	N-Nitrosopiperidine	100-75-4	3.1E-06	1.1E+02	4.3E-01	1.0E-03	7.3E+05	1.4E-06	1.4E-05
SVOC	N-Nitrosopyrrolidine	930-55-2	1.3E-07	1.0E+02	4.5E-01	1.1E-03	1.6E+07	6.1E-08	6.1E-07
SVOC	5-Nitro-o-toluidine	99-55-8	2.0E-07	1.5E+02	3.9E-01	8.9E-04	1.3E+07	7.8E-08	7.8E-07
SVOC	N-Nitrosomorpholine	59-89-2	4.7E-07	1.2E+02	4.3E-01	1.0E-03	4.9E+06	2.0E-07	2.0E-06
SVOC	2,2'-oxybis(1-Chloropropane)	108-60-1	1.3E-03	1.7E+02	3.8E-01	8.4E-04	3.2E+03	3.1E-04	3.1E-03
SVOC	Pentachlorobenzene	608-93-5	8.0E-03	2.5E+02	3.3E-01	6.9E-04	1.8E+03	5.5E-04	5.5E-03
SVOC	Pentachloronitrobenzene	82-68-8	4.3E-03	3.0E+02	3.2E-01	6.4E-04	2.3E+03	4.3E-04	4.3E-03
SVOC	Pentachlorophenol	87-86-5	2.8E-07	2.7E+02	3.3E-01	6.7E-04	1.1E+07	9.0E-08	9.0E-07
SVOC	Phenacetin	62-44-2	2.4E-09	1.8E+02	3.7E-01	8.2E-04	1.1E+09	8.9E-10	8.9E-09
SVOC	Phenanthrene	85-01-8	2.6E-04	1.8E+02	3.7E-01	8.2E-04	1.1E+04	8.7E-05	8.7E-04
SVOC	Phenol	108-95-2	7.7E-06	9.4E+01	4.6E-01	1.1E-03	2.8E+05	3.6E-06	3.6E-05
SVOC	p-Phenylene diamine	106-50-3	8.7E-09	1.1E+02	4.4E-01	1.1E-03	2.6E+08	3.8E-09	3.8E-08
SVOC	Phorate	298-02-2	4.9E-06	2.6E+02	3.3E-01	6.8E-04	6.2E+05	1.6E-06	1.6E-05
SVOC	2-Picoline	109-06-8	1.1E-04	9.3E+01	4.6E-01	1.1E-03	2.0E+04	4.9E-05	4.9E-04
SVOC	Pronamide	23950-58-5	6.0E-05	2.6E+02	3.3E-01	6.8E-04	5.2E+04	1.9E-05	1.9E-04
SVOC	Pyrene	129-00-0	1.4E-04	2.0E+02	3.6E-01	7.7E-04	2.1E+04	4.7E-05	4.7E-04
SVOC	Pyridine	110-86-1	1.0E-04	7.9E+01	4.9E-01	1.2E-03	2.1E+04	4.7E-05	4.7E-04
SVOC	Safrole (total)	94-59-7	2.1E-04	1.6E+02	3.9E-01	8.6E-04	1.4E+04	7.4E-05	7.4E-04
SVOC	Sulfotepp	3689-24-5	3.2E-05	3.2E+02	3.1E-01	6.1E-04	1.0E+05	9.8E-06	9.8E-05
SVOC	1,2,4,5-Tetrachlorobenzene	95-94-3	2.9E-02	2.2E+02	3.5E-01	7.4E-04	1.4E+03	6.9E-04	6.9E-03
SVOC	2,3,4,6-Tetrachlorophenol	58-90-2	4.9E-05	2.3E+02	3.4E-01	7.2E-04	6.1E+04	1.6E-05	1.6E-04
SVOC	Thionazin	297-97-2	9.7E-06	2.5E+02	3.3E-01	6.9E-04	3.1E+05	3.2E-06	3.2E-05
SVOC	o-Toluidine	95-53-4	3.1E-05	1.1E+02	4.4E-01	1.1E-03	7.5E+04	1.3E-05	1.3E-04
SVOC	2,4,5-Trichlorophenol	95-95-4	7.9E-05	2.0E+02	3.6E-01	7.8E-04	3.7E+04	2.7E-05	2.7E-04
SVOC	2,4,6-Trichlorophenol	88-06-2	1.3E-04	2.0E+02	3.6E-01	7.8E-04	2.2E+04	4.4E-05	4.4E-04
SVOC	O,O,O-Triethyl phosphorothioate	126-68-1		2.0E+02	3.6E-01	7.8E-04			
SVOC	1,3,5-Trinitrobenzene	99-35-4	1.8E-07	2.1E+02	3.5E-01	7.5E-04	1.6E+07	6.3E-08	6.3E-07
INORG	Aluminum	7429-90-5		2.7E+01	7.0E-01	2.1E-03			
INORG	Antimony	7440-36-0		1.2E+02	4.2E-01	9.9E-04			
INORG	Arsenic	7440-38-2		7.5E+01	5.0E-01	1.3E-03			
INORG	Barium	7440-39-3		1.4E+02	4.1E-01	9.3E-04			
INORG	Beryllium	7440-41-7		9.0E+00	1.0E+00	3.6E-03			
INORG	Cadmium	7440-43-9		1.1E+02	4.4E-01	1.0E-03			

Attachment A3: Normalized Vapor Flux to Ambient Air from Surface Water for Trespassers
Bway Corporation, Cincinnati, Ohio

Chem Group	Chemical	CASRN	H (unitless)	MW (g/mol)	k_G (cm/s)	k_L (cm/s)	$1/K_L$ (s/cm)	K_L (cm/s)	J_L (L/m^2-s)
INORG	Chromium (total)	7440-47-3		5.2E+01	5.6E-01	1.5E-03			
INORG	Chromium III	16065-83-1		5.2E+01	5.6E-01	1.5E-03			
INORG	Chromium VI	18540-29-9		5.2E+01	5.6E-01	1.5E-03			
INORG	Cobalt	7440-48-4		5.9E+01	5.4E-01	1.4E-03			
INORG	Copper	7440-50-8		6.4E+01	5.3E-01	1.4E-03			
INORG	Iron	7439-89-6		5.6E+01	5.5E-01	1.5E-03			
INORG	Manganese	7439-96-5		5.5E+01	5.5E-01	1.5E-03			
INORG	Mercury	7439-97-6	1.9E-01	2.0E+02	3.6E-01	7.7E-04	1.3E+03	7.6E-04	7.6E-03
INORG	Nickel	7440-02-0		5.9E+01	5.4E-01	1.4E-03			
INORG	Selenium	7782-49-2		7.9E+01	4.9E-01	1.2E-03			
INORG	Silver	7440-22-4		1.1E+02	4.4E-01	1.1E-03			
INORG	Thallium	7440-28-0		2.0E+02	3.6E-01	7.6E-04			
INORG	Vanadium	7440-62-2		5.1E+01	5.7E-01	1.5E-03			
INORG	Zinc	7440-66-6		6.5E+01	5.2E-01	1.4E-03			
Notes:	Molecular Weight of Oxygen	g/mol	**MW_{02}**	32					
	Molecular Weight of Water	g/mol	**MW_{H20}**	18					
	Temperature	K	**T**	288					
	Liquid-phase Mass Transfer Coefficient for Oxygen	cm/s	**$k_{L,02}$**	0.002					
	Gas-Phase Mass Transfer Coefficient for Water Vapor at 25 °C	cm/s	**$K_{G,H20}$**	0.833					

Attachment A3: Air Dispersion Factor 'C/Q' for Inhalation of Vapors from Surface Water
Bway Corporation, Cincinnati, Ohio

		Adolescent Trespasser	Adult Trespasser
Exposure Area	acres	48	48
C/Q (Vapor)	kg/m^3 per kg/m^2-s	24.19	24.19
Note:			
The approximate total area of the surface water bodies on-site is 48 acres.			

Attachment A3: Single Chemical Risks and HQ Estimates for Exposure to Surface Water
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Max Detected (mg/L)	Adolescent Trespasser SW Contact Risk	Adolescent Trespasser SW Contact HQ	Adult Trespasser SW Contact Risk	Adult Trespasser SW Contact HQ
on	AOI C	VOC	Acetone	67-64-1	ID	3.60E-03		8.0E-07		8.1E-07
on	AOI C	VOC	2-Butanone	78-93-3	ID	1.30E-03		2.2E-06		2.3E-06
on	AOI C	VOC	Carbon Disulfide	75-15-0		1.50E-03		4.4E-05		4.5E-05
on	AOI C	VOC	Toluene	108-88-3	ID	1.90E-03		1.3E-05		1.7E-05
on	AOI C	VOC	Trichloroethene	79-01-6	C-B2	3.30E-04	1.3E-09	2.0E-05	4.1E-09	2.7E-05
on	AOI C	VOC	Vinyl Chloride	75-01-4	A	6.80E-04	2.7E-08	1.6E-04	9.3E-08	1.7E-04
on	AOI C	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	4.10E-03	1.3E-07	3.1E-03	6.3E-07	5.2E-03
on	AOI C	SVOC	Methylphenol (total)	1319-77-3		1.55E-02		2.3E-04		3.6E-04
on	AOI C	INORG	Aluminum	7429-90-5	ID	8.10E-01		9.3E-06		1.1E-05
on	AOI C	INORG	Arsenic	7440-38-2	A	3.60E-03	8.9E-09	1.4E-04	3.0E-08	1.6E-04
on	AOI C	INORG	Barium	7440-39-3	NC	8.45E-02		3.3E-05		5.3E-05
on	AOI C	INORG	Chromium III	16065-83-1	D	1.00E-03		2.7E-07		4.4E-07
on	AOI C	INORG	Chromium VI	18540-29-9	A	4.00E-03		5.5E-04		9.1E-04
on	AOI C	INORG	Cobalt	7440-48-4	LC	2.10E-03		8.9E-07		8.5E-07
on	AOI C	INORG	Iron	7439-89-6	D	2.40E+00		4.0E-05		4.5E-05
on	AOI C	INORG	Lead	7439-92-1	B2	2.00E-03				
on	AOI C	INORG	Manganese	7439-96-5	D	2.95E-01		1.9E-04		3.1E-04
on	AOI C	INORG	Thallium	7440-28-0		5.50E-03		9.1E-04		1.0E-03
on	AOI C	INORG	Vanadium	7440-62-2		1.10E-03		3.2E-05		5.2E-05
on	AOI C	INORG	Zinc	7440-66-6	ID	9.50E-03		3.0E-07		3.1E-07
on	SWMU 22	SVOC	Pyridine	110-86-1		6.10E-04		1.4E-04		1.5E-04
on	SWMU 22	INORG	Aluminum	7429-90-5	ID	4.53E-01		5.2E-06		6.0E-06
on	SWMU 22	INORG	Barium	7440-39-3	NC	1.07E-02		4.2E-06		6.7E-06
on	SWMU 22	INORG	Chromium III	16065-83-1	D	1.00E-03		2.7E-07		4.4E-07
on	SWMU 22	INORG	Chromium VI	18540-29-9	A	9.00E-03		1.2E-03		2.0E-03
on	SWMU 22	INORG	Iron	7439-89-6	D	2.10E-01		3.5E-06		3.9E-06
on	SWMU 22	INORG	Manganese	7439-96-5	D	4.94E-02		3.2E-05		5.1E-05
on	SWMU 22	INORG	Mercury	7439-97-6	D	1.60E-03		6.5E-02		6.5E-02
on	SWMU 22	INORG	Nickel	7440-02-0	A	3.50E-03		5.6E-06		8.2E-06
on	SWMU 22	INORG	Thallium	7440-28-0		5.50E-03		9.1E-04		1.0E-03
off	AOI B	VOC	Carbon Disulfide	75-15-0		3.10E-04		9.1E-06		9.3E-06
off	AOI B	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	1.70E-03	5.2E-08	1.3E-03	2.6E-07	2.2E-03
off	AOI B	INORG	Antimony	7440-36-0		1.02E-02		1.0E-03		1.6E-03
off	AOI B	INORG	Barium	7440-39-3	NC	8.11E-02		3.2E-05		5.1E-05
off	AOI B	INORG	Chromium III	16065-83-1	D	1.00E-03		2.7E-07		4.4E-07
off	AOI B	INORG	Chromium VI	18540-29-9	A	4.00E-03		5.5E-04		9.1E-04

Attachment A3: Single Chemical Risks and HQ Estimates for Exposure to Surface Water Bway Corporation, Cincinnati, Ohio										
On/Off-Site	**Area**	**Chem Group**	**Chemical**	**CASRN**	**Carc Class**	**Max Detected** (mg/L)	**Adolescent Trespasser SW Contact Risk**	**Adolescent Trespasser SW Contact HQ**	**Adult Trespasser SW Contact Risk**	**Adult Trespasser SW Contact HQ**
off	AOI B	INORG	Iron	7439-89-6	D	3.05E-01		5.0E-06		5.7E-06
off	AOI B	INORG	Manganese	7439-96-5	D	1.03E-01		6.7E-05		1.1E-04
off	AOI B	INORG	Mercury	7439-97-6	D	2.20E-03		9.0E-02		9.0E-02
off	AOI B	INORG	Thallium	7440-28-0		5.30E-03		8.7E-04		1.0E-03
off	AOI B	INORG	Vanadium	7440-62-2		1.40E-03		4.0E-05		6.6E-05
off	AOI B	INORG	Zinc	7440-66-6	ID	7.32E-02		2.3E-06		2.4E-06
	Notes:									
	Only constituents detected in each area are shown.									
	Chem Group - chemical group									
	Carc Class - USEPA Weight-of-Evidence Cancer Classification									

Attachment A3: Single Chemical Risk and HQ Estimates for Exposure to Sediment
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Max Detected (mg/kg)	Adolescent Trespasser Sediment Contact Risk	Adolescent Trespasser Sediment Contact HQ	Adult Trespasser Sediment Contact Risk	Adult Trespasser Sediment Contact HQ
on	AOI C	VOC	Acetone	67-64-1	ID	1.50E-01		1.1E-08		7.8E-09
on	AOI C	VOC	2-Butanone	78-93-3	ID	3.50E-02		3.8E-09		2.7E-09
on	AOI C	VOC	Tetrachloroethene	127-18-4	C-B2	4.80E-01	2.3E-10	3.1E-06	5.0E-10	2.3E-06
on	AOI C	VOC	Trichloroethene	79-01-6	C-B2	8.80E-02	8.9E-12	9.5E-07	1.9E-11	6.9E-07
on	AOI C	SVOC	Benzo(a)anthracene	56-55-3	B2	1.00E-01	2.1E-09		3.9E-09	
on	AOI C	SVOC	Benzo(a)pyrene	50-32-8	B2	1.20E-01	2.5E-08		4.7E-08	
on	AOI C	SVOC	Benzo(b)fluoranthene	205-99-2	B2	1.80E-01	3.7E-09		7.0E-09	
on	AOI C	SVOC	Benzo(g,h,i)perylene	191-24-2	D	9.20E-02		6.0E-07		3.8E-07
on	AOI C	SVOC	Benzo(k)fluoranthene	207-08-9	B2	7.60E-02	1.6E-10		2.9E-10	
on	AOI C	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	9.70E-02	3.2E-11	8.1E-07	6.2E-11	5.1E-07
on	AOI C	SVOC	Chrysene	218-01-9	B2	1.50E-01	3.1E-11		5.8E-11	
on	AOI C	SVOC	Fluoranthene	206-44-0	D	2.70E-01		1.3E-06		8.4E-07
on	AOI C	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	7.20E-02	1.5E-09		2.8E-09	
on	AOI C	SVOC	Phenanthrene	85-01-8	D	1.10E-01		7.2E-07		4.5E-07
on	AOI C	SVOC	Pyrene	129-00-0	NC	2.40E-01		1.6E-06		9.9E-07
on	AOI C	INORG	Aluminum	7429-90-5	ID	1.12E+04		7.2E-04		5.2E-04
on	AOI C	INORG	Arsenic	7440-38-2	A	7.60E+00	1.5E-07	2.4E-03	3.2E-07	1.6E-03
on	AOI C	INORG	Barium	7440-39-3	NC	1.18E+02		3.8E-05		2.8E-05
on	AOI C	INORG	Beryllium	7440-41-7	B1	5.55E-01		1.8E-05		1.3E-05
on	AOI C	INORG	Cadmium	7440-43-9	B1	1.20E+00		1.3E-04		8.5E-05
on	AOI C	INORG	Chromium III	16065-83-1	D	7.85E+00		3.4E-07		2.5E-07
on	AOI C	INORG	Chromium VI	18540-29-9	A	2.05E+01		4.4E-04		3.2E-04
on	AOI C	INORG	Cobalt	7440-48-4	LC	7.20E+00		2.3E-05		1.7E-05
on	AOI C	INORG	Copper	7440-50-8	D	3.67E+01		5.9E-05		4.3E-05
on	AOI C	INORG	Iron	7439-89-6	D	2.03E+04		1.9E-03		1.4E-03
on	AOI C	INORG	Lead	7439-92-1	B2	7.22E+01				
on	AOI C	INORG	Manganese	7439-96-5	D	2.43E+02		1.1E-04		8.2E-05
on	AOI C	INORG	Mercury	7439-97-6	D	1.40E-01		3.0E-05		2.2E-05
on	AOI C	INORG	Nickel	7440-02-0	A	2.31E+01		7.4E-05		5.4E-05
on	AOI C	INORG	Selenium	7782-49-2	D	5.40E+00		7.0E-05		5.1E-05
on	AOI C	INORG	Vanadium	7440-62-2		2.23E+01		2.1E-04		1.5E-04
on	AOI C	INORG	Zinc	7440-66-6	ID	1.63E+02		3.5E-05		2.6E-05
on	SWMU 22	VOC	Acetone	67-64-1	ID	4.00E+00		2.9E-07		2.1E-07
on	SWMU 22	VOC	Acetonitrile	75-05-8	D	1.60E-01				
on	SWMU 22	VOC	Benzene	71-43-2	A	3.70E-03	1.9E-12	6.0E-08	4.1E-12	4.3E-08
on	SWMU 22	VOC	2-Butanone	78-93-3	ID	1.10E+00		1.2E-07		8.6E-08

Attachment A3: Single Chemical Risk and HQ Estimates for Exposure to Sediment
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Max Detected (mg/kg)	Adolescent Trespasser Sediment Contact Risk	Adolescent Trespasser Sediment Contact HQ	Adult Trespasser Sediment Contact Risk	Adult Trespasser Sediment Contact HQ
on	SWMU 22	VOC	Carbon Disulfide	75-15-0		8.40E-02		5.4E-08		3.9E-08
on	SWMU 22	VOC	Ethyl Benzene	100-41-4	D	1.60E-01		1.0E-07		7.5E-08
on	SWMU 22	VOC	Methylene Chloride	75-09-2	B2	1.50E-02	1.0E-12	1.6E-08	2.3E-12	1.2E-08
on	SWMU 22	VOC	Toluene	108-88-3	ID	9.70E-01		7.8E-07		5.7E-07
on	SWMU 22	VOC	Xylenes (total)	1330-20-7	ID	7.10E-01		2.3E-07		1.7E-07
on	SWMU 22	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	4.20E+00	1.4E-09	3.5E-05	2.7E-09	2.2E-05
on	SWMU 22	INORG	Aluminum	7429-90-5	ID	9.02E+04		5.8E-03		4.2E-03
on	SWMU 22	INORG	Antimony	7440-36-0		1.80E+00		2.9E-04		2.1E-04
on	SWMU 22	INORG	Arsenic	7440-38-2	A	1.32E+01	2.7E-07	4.2E-03	5.5E-07	2.8E-03
on	SWMU 22	INORG	Barium	7440-39-3	NC	1.06E+02		3.4E-05		2.5E-05
on	SWMU 22	INORG	Cadmium	7440-43-9	B1	8.70E-01		9.2E-05		6.1E-05
on	SWMU 22	INORG	Chromium III	16065-83-1	D	1.98E+02		8.5E-06		6.2E-06
on	SWMU 22	INORG	Cobalt	7440-48-4	LC	8.70E+00		2.8E-05		2.0E-05
on	SWMU 22	INORG	Copper	7440-50-8	D	4.25E+02		6.8E-04		5.0E-04
on	SWMU 22	INORG	Iron	7439-89-6	D	2.35E+04		2.2E-03		1.6E-03
on	SWMU 22	INORG	Lead	7439-92-1	B2	3.07E+01				
on	SWMU 22	INORG	Manganese	7439-96-5	D	2.10E+02		9.7E-05		7.0E-05
on	SWMU 22	INORG	Mercury	7439-97-6	D	1.00E-01		2.1E-05		1.6E-05
on	SWMU 22	INORG	Nickel	7440-02-0	A	5.08E+01		1.6E-04		1.2E-04
on	SWMU 22	INORG	Silver	7440-22-4	D	1.35E+01		1.7E-04		1.3E-04
on	SWMU 22	INORG	Vanadium	7440-62-2		3.44E+01		3.2E-04		2.3E-04
on	SWMU 22	INORG	Zinc	7440-66-6	ID	9.43E+02		2.0E-04		1.5E-04
off	AOI B	VOC	Acetone	67-64-1	ID	1.10E-02		7.9E-10		5.7E-10
off	AOI B	VOC	2-Butanone	78-93-3	ID	7.50E-03		8.1E-10		5.9E-10
off	AOI B	VOC	Methylene Chloride	75-09-2	B2	1.10E-03	7.6E-14	1.2E-09	1.7E-13	8.6E-10
off	AOI B	VOC	Tetrachloroethene	127-18-4	C-B2	1.00E-03	4.8E-13	6.4E-09	1.0E-12	4.7E-09
off	AOI B	SVOC	Acenaphthene	83-32-9		1.50E-01		4.9E-07		3.1E-07
off	AOI B	SVOC	Acenaphthylene	208-96-8	D	5.90E-02		3.9E-07		2.4E-07
off	AOI B	SVOC	Anthracene	120-12-7	D	4.10E-01		2.7E-07		1.7E-07
off	AOI B	SVOC	Benzo(a)anthracene	56-55-3	B2	3.00E+00	6.2E-08		1.2E-07	
off	AOI B	SVOC	Benzo(a)pyrene	50-32-8	B2	3.20E+00	6.6E-07		1.2E-06	
off	AOI B	SVOC	Benzo(b)fluoranthene	205-99-2	B2	5.50E+00	1.1E-07		2.1E-07	
off	AOI B	SVOC	Benzo(g,h,i)perylene	191-24-2	D	2.70E+00		1.8E-05		1.1E-05
off	AOI B	SVOC	Benzo(k)fluoranthene	207-08-9	B2	2.10E+00	4.3E-09		8.1E-09	
off	AOI B	SVOC	Chrysene	218-01-9	B2	4.50E+00	9.2E-10		1.7E-09	
off	AOI B	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	6.90E-01	1.4E-07		2.7E-07	

Attachment A3: Single Chemical Risk and HQ Estimates for Exposure to Sediment
Bway Corporation, Cincinnati, Ohio

On/Off-Site	Area	Chem Group	Chemical	CASRN	Carc Class	Max Detected (mg/kg)	Adolescent Trespasser Sediment Contact Risk	Adolescent Trespasser Sediment Contact HQ	Adult Trespasser Sediment Contact Risk	Adult Trespasser Sediment Contact HQ
off	AOI B	SVOC	Fluoranthene	206-44-0	D	1.00E+01		4.9E-05		3.1E-05
off	AOI B	SVOC	Fluorene	86-73-7	D	9.60E-02		4.7E-07		3.0E-07
off	AOI B	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	2.40E+00	4.9E-08		9.3E-08	
off	AOI B	SVOC	Phenanthrene	85-01-8	D	3.50E+00		2.3E-05		1.4E-05
off	AOI B	SVOC	Pyrene	129-00-0	NC	7.10E+00		4.7E-05		2.9E-05
off	AOI B	INORG	Aluminum	7429-90-5	ID	5.45E+03		3.5E-04		2.6E-04
off	AOI B	INORG	Arsenic	7440-38-2	A	7.90E+00	1.6E-07	2.5E-03	3.3E-07	1.7E-03
off	AOI B	INORG	Barium	7440-39-3	NC	6.96E+01		2.2E-05		1.6E-05
off	AOI B	INORG	Beryllium	7440-41-7	B1	1.90E-01		6.1E-06		4.5E-06
off	AOI B	INORG	Cadmium	7440-43-9	B1	3.50E-01		3.7E-05		2.5E-05
off	AOI B	INORG	Chromium III	16065-83-1	D	2.44E+01		1.0E-06		7.6E-07
off	AOI B	INORG	Cobalt	7440-48-4	LC	5.40E+00		1.7E-05		1.3E-05
off	AOI B	INORG	Copper	7440-50-8	D	1.67E+01		2.7E-05		2.0E-05
off	AOI B	INORG	Iron	7439-89-6	D	1.21E+04		1.1E-03		8.1E-04
off	AOI B	INORG	Lead	7439-92-1	B2	1.26E+01				
off	AOI B	INORG	Manganese	7439-96-5	D	6.82E+02		3.1E-04		2.3E-04
off	AOI B	INORG	Nickel	7440-02-0	A	1.12E+01		3.6E-05		2.6E-05
off	AOI B	INORG	Selenium	7782-49-2	D	6.70E-01		8.6E-06		6.3E-06
off	AOI B	INORG	Vanadium	7440-62-2		1.35E+01		1.2E-04		9.1E-05
off	AOI B	INORG	Zinc	7440-66-6	ID	4.77E+02		1.0E-04		7.5E-05

Notes:

Only constituents detected in each area are shown.

The concentrations for the Xylene isomers (m/p and o) were summed to Xylenes (total).

Chem Group - chemical group

Carc Class - USEPA Weight-of-Evidence Cancer Classification

Appendix B

OW-6

DATE	T/D	AS	CR	FE	PB	MN	TL	PCE	TCE	VC
9/17/2014	T	1.4 J	18	1100	0.91 JB	44	0.12 JB	1.2	< 1 U	< 1 U
9/17/2014	D	0.84 JB	< 2 U	< 50 U	< 1 U	8	< 1 U	N/A	N/A	N/A
12/16/2014	T	1 J	15 Bj	310 Bu	0.27 JBj	13	< 1 U	1.8	0.15 J	< 1 U
12/16/2014	D	0.91 JB	1.3 JB	< 50 Uu	< 1 Uj	6 B	< 1 U	N/A	N/A	N/A
3/9/2015	T	<1.4 JBu	13 B	1000	0.84 JBu	34	< 1 U	1.8	< 1 U	< 1 U
3/9/2015	D	0.69 J	<1.4 JBu	< 50 U	< 1 U	5.1	< 1 U	N/A	N/A	N/A
5/19/2015		2.4 JB	19 B	2100	1.8	64	< 1 U	2	< 1 U	< 1 U
5/19/2015	D	1.2 JB	1.5 JB	< 50 U	0.17 JB	2 J	< 1 U	N/A	N/A	N/A

OW-2

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2.3 J	2.7	1500	2.8 B	72	1.5 B	< 1 U	< 1 U
9/17/2014	D	0.57 JB	< 2 U	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	5.2 Bj	3200 B	5.6 B	160	0.28 J	< 1 U	< 1 U
12/16/2014	D	0.65 JBj	1.2 J Bj	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
3/9/2015	T	4.2 JB	< 6.2 Bu	7100	6.1 B	390	0.088 J	< 1 U	< 1 U
3/9/2015	D	0.76 J	<1.4 JBu	< 50 U	0.26 J	1.3 J	0.3 J	N/A	N/A
5/19/2015	T	1.8 JB	2.6 B	2000 j	1.7	61	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.9 JB	1.6 JB	17 JB	0.42 JB	< 5 U	0.35 JB	N/A	N/A

OW-3

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	7.6	7.3	20000	11 B	1200	0.44 JB	29	< 1 U
9/17/2014	D	0.5 JB	< 2 U	< 50 U	< 1 U	320	< 1 U	N/A	N/A
12/16/2014	T	4.7 J	6.1 Bj	12000 B	6 B j	1400	0.12 J	11	< 1 U
12/16/2014	D	0.61 JBj	1.1 JBj	< 50 U	< 1 U	510 B	< 1 U	N/A	N/A
3/9/2015	T	4.5 JB	< 5.6 Bu	12000	6.5 B	890	0.096 J	11	< 1 U
3/9/2015	D	0.62 J	<1.3 JBu	< 50 U	0.13 J	550	0.11 J	N/A	N/A
5/19/2015	T	3.3 JB	4.7 B	8400	4.6	820	< 1 U	20	< 1 U
5/19/2015	D	1.1 JB	1.4 JB	< 50 U	0.25 JB	220	0.15 JB	N/A	N/A

OW-6D

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	13	35	3500	0.55 JB	240	0.12 JB	< 1 U	< 1 U
9/17/2014	D	7.2 B	30	2200	0.32 J	240	< 1 U	N/A	N/A
12/16/2014	T	9.1	44 B	2900 B	<0.33 JBu	240	< 1 U	< 1 U	< 1 U
12/16/2014	D	5.1 B	1.3 JBj	< 50 U	< 1 U	230 B	< 1 U	N/A	N/A
3/9/2015	T	13 B	45 B	4000	< 1 Bu	300	< 1 U	< 1 U	< 1 U
3/9/2015	D	6.4	<1.2 JBu	< 50 U	< 1 U	250	< 1 U	N/A	N/A
5/19/2015	T	8.1 B	2 B	1900	0.13 J	230	< 1 U	< 1 U	< 1 U
5/19/2015	D	5 B	2.6 B	140 B	0.17 JB	230	< 1 U	N/A	N/A

OW-4

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2 J	2.7	630	0.47 JB	64	0.29 JB	< 1 U	< 1 U
9/17/2014	D	1.5 JB	< 2 U	< 50 U	< 1 U	21	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	61 B	1200 B	0.9 JBj	98	0.085 J	< 1 U	< 1 U
12/16/2014	D	1.6 JBj	1.1 JBj	< 50 U	< 1 U	10 B j	< 1 U	N/A	N/A
3/9/2015	T	<1.8 JBu	< 2.7 Bu	160	< 0.19 JBu	15	< 1 U	< 1 U	< 1 U
3/9/2015	D	1.6 J	<1.2 JBu	< 50 U	< 1 U	3.3 J	0.092 J	N/A	N/A
5/19/2015	T	3.9 JB	110 B	3800	2.3	320	0.09 J	< 1 U	< 1 U
5/19/2015	D	1.5 JB	1.5 JB	< 50 U	0.21 JB	31	0.13 JB	N/A	N/A

OW-7

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	0.63 J	2.1	290	0.19 JB	47	0.11 JB	< 1 U	< 1 U
9/17/2014	D	0.57 JB	< 2 U	< 50 U	< 1 U	37	< 1 U	N/A	N/A
12/16/2014	T	1 J	9.1 Bj	320 Bu	0.27 JBj	24	< 1 U	< 1 U	< 1 U
12/16/2014	D	0.85 JBj	2 Bj	< 50 U	< 1 U	11 Bj	< 1 U	N/A	N/A
3/9/2015	T	<2.2 JBu	33 B	2200	1.4 B	120	< 1 U	< 1 U	< 1 U
3/9/2015	D	0.88 J	< 3.2 Bu	< 50 U	< 1 U	6.2	< 1 U	N/A	N/A
5/19/2015	T	2.3 JB	41 B	2100	1.2	96	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.1 JB	1.4 JB	< 50 U	0.16 JB	6.5	< 1 U	N/A	N/A

OW-1

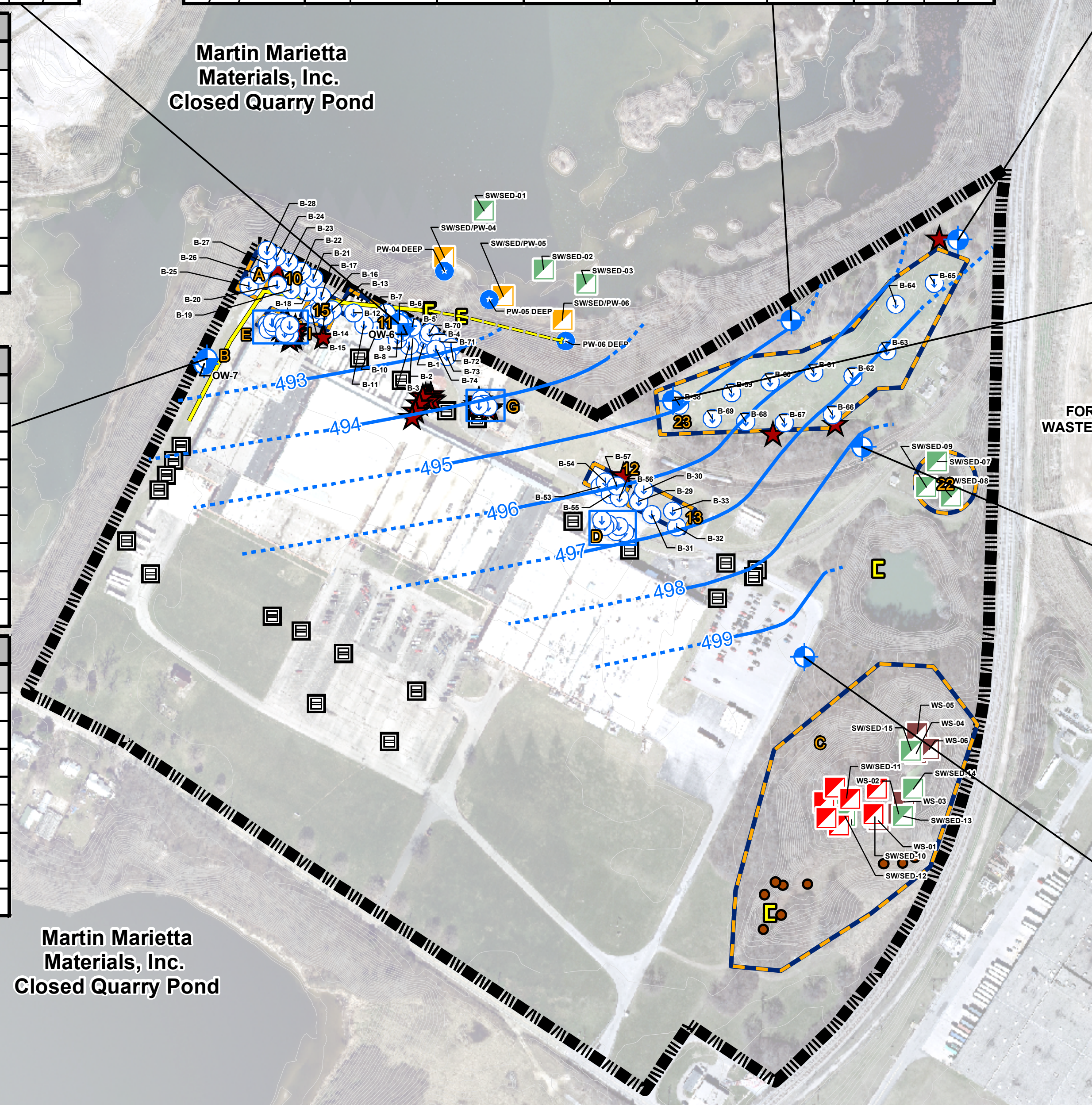
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2.7 J	16	260	0.73 JB	9.2	0.99 JB	< 1 U	< 1 U
9/17/2014	D	2.1 JB	0.4 J	< 50 U	0.12 J	3.6 J	0.11 J	N/A	N/A
12/16/2014	T	2.4 J	1.5 JBj	180 Bu	0.29 JBj	8.1	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.3 J	1.4 JBj	< 50 U	0.17 J	< 5 U	0.23 J	N/A	N/A
3/9/2015	T	2.6 JB	< 2.2 Bu	240	<0.44 JBu	10	0.19 J	< 1 U	< 1 U
3/9/2015	D	2.2 J	<1.4 JBu	< 50 U	0.16 J	< 5 U	0.21 J	N/A	N/A
5/19/2015	T	2.6 JB	9.4 B	170	0.28 J	10	0.091 J	< 1 U	< 1 U
5/19/2015	D	3.1 JB	1.6 JB	22 JB	0.34 JB	< 5 U	0.23 JB	N/A	N/A

OW-7D

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	4.8 J	13	6600	0.19 JB	53	0.077 JB	< 1 U	< 1 U
9/17/2014	D	1.9 JB	< 2 U	380	< 1 U	46	< 1 U	N/A	N/A
12/16/2014	T	6.4	50 B	7200 B	0.83 JBj	71	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.2 JBj	1.2 JBj	62 Bu	< 1 U	40 B	< 1 U	N/A	N/A
3/9/2015	T	7.7 B	26 B	7200	<0.33 JBu	57	< 1 U	< 1 U	< 1 U
3/9/2015	D	3.2 J	<1.3 JBu	270	< 1 U	46	< 1 U	N/A	N/A
5/19/2015	T	8.5 B	2.9 B	7200	0.63 J	71	< 1 U	< 1 U	< 1 U
5/19/2015	D	2.9 JB	1.6 JB	< 50 U	0.13 JB	44	< 1 U	N/A	N/A

OW-5

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	3.2 J	35	3000	1.8 B	270	0.26 JB	< 1 U	0.43 J
9/17/2014	D	1.3 JB	< 2 U	< 50 U	< 1 U	220	< 1 U	N/A	N/A
12/16/2014	T	1.5 J	2.5 B	550 B	0.33 JB	33	0.087 J	< 1 U	< 1 U
12/16/2014	D	0.94 JBj	1.1 JBj	< 50 U	< 1 U	15 Bj	< 1 U	N/A	N/A
3/9/2015	T	9.2 B	22 B	9900	4.9 B	370	0.2 J	< 1 U	< 1 U
3/9/2015	D	1 J	<1.2 JBu	< 50 U	< 1 U	20	< 1 U	N/A	N/A
5/19/2015	T	1.9 JB	3 B	940	0.6 J	23	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.4 JB	1.4 JB	< 50 U	0.22 JB	1.2 J	0.14 JB	N/A	N/A



LEGEND

- Groundwater Observation Well
- Groundwater Contours (5/19/2015)
- Groundwater Contours (extrapolated)
- BWAY Property Boundary
- 2 FT Ground Surface Contours
- SWMU, AOC, or AOI investigated area

RFI Sampling Locations

- Geoprobe Soil Sample Location
- Pore Water Sample Location
- Collocated Surface Water and Sediment Sample Location
- Collocated Surface Water, Sediment, and Pore Water Sample Location
- Shallow Wetland Soil Sample Location

N

0 200 400
Feet

legal shown

Notes
All samples reported in UG/L (micrograms per liter); QA/QC Duplicate samples not shown on figure.
AS = Arsenic; CR = Chromium; FE = Iron; PB = Lead; MN = Manganese; TL = Thallium; TCE = Trichloroethene; VC = Vinyl Chloride; PCE = Tetrachlorethene
RSL: USEPA Regional Screening Levels, November 2015 (Iron RSL = 15,000) (Manganese RSL = 480)
MCL: Maximum Contaminant Level enforceable standard of National Primary Drinking Water Regulations under Safe Drinking Water Act
(Arsenic MCL = **10**) (Chromium MCL = **100**) (Lead MCL = **15**) (Thallium MCL = **2**) (TCE MCL = **5**) (Vinyl Chloride MCL = **2**)
T/D: measured basis (metals only); T = total, D = dissolved
N/A: Not Analyzed
U: Test America Lab Qualifier. Nondetect.
J: Test America Lab Qualifier. Method blank contamination. The associated method blank contains the target analyte at a reportable level.
B: Test America Lab Qualifier. Estimated result. Result is less than the reporting limit.
j: TRC Qualifier. The analyte was not detected above the reporting sample quantitation limit. However, the reported quantitation limit is approx. and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
u: TRC Qualifier. The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

TITLE
GROUNDWATER SAMPLE LOCATIONS & RESULTS SINCE SEPTEMBER 2014

PROJECT
BWAY RCRA CORRECTIVE ACTION (RCRA-05-2007-0011)

DATE
Tuesday, March 22, 2016

FIGURE
1

PROJECT NUMBER
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Table B-1a: Groundwater Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria
on	SWMU 23	VOC	Trichloroethene	79-01-6	T	HC	16	4	1.10E-02	2.90E-02	5.0E-03	SM	**5.8E+00**
on	SWMU 23	SVOC	Acetophenone	98-86-2	T	D	16	1	2.80E-04	2.80E-04	2.0E+00	NC	1.4E-04
on	SWMU 23	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	16	3	1.50E-03	3.40E-03	6.0E-03	SM	5.7E-01
on	SWMU 23	SVOC	Butylbenzylphthalate	85-68-7	T	C	16	2	2.00E-04	2.40E-04	4.1E-01	C	5.9E-04
on	SWMU 23	SVOC	Diethylphthalate	84-66-2	T	D	16	7	2.80E-04	8.80E-04	1.6E+01	NC	5.5E-05
on	SWMU 23	SVOC	Di-n-butylphthalate	84-74-2	T	D	16	1	4.10E-04	4.10E-04	2.0E+00	NC	2.1E-04
on	SWMU 23	SVOC	Di-n-octylphthalate	117-84-0	T		16	1	1.40E-03	1.40E-03	2.0E-01	NC	7.0E-03
on	SWMU 23	SVOC	Phenol	108-95-2	T	ID	16	4	4.90E-04	6.20E-04	6.0E+00	NC	1.0E-04
on	SWMU 23	INORG	Aluminum	7429-90-5	D	ID	16	2	9.10E-03	9.90E-03	2.0E+01	NC	5.0E-04
on	SWMU 23	INORG	Antimony	7440-36-0	D	ID	16	10	1.60E-04	5.50E-04	6.0E-03	SM	9.2E-02
on	SWMU 23	INORG	Arsenic	7440-38-2	D	A	16	16	5.00E-04	3.10E-03	1.0E-02	SM	3.1E-01
on	SWMU 23	INORG	Barium	7440-39-3	D	NC	16	16	4.20E-02	8.30E-02	2.0E+00	SM	4.2E-02
on	SWMU 23	INORG	Beryllium	7440-41-7	D	B1	16	13	6.00E-05	1.90E-03	4.0E-03	SM	4.8E-01
on	SWMU 23	INORG	Cadmium	7440-43-9	D	B1	16	10	6.30E-05	3.80E-04	5.0E-03	SM	7.6E-02
on	SWMU 23	INORG	Chromium (total)	7440-47-3	D		16	10	4.00E-04	1.70E-03	1.0E-01	SM	1.7E-02
on	SWMU 23	INORG	Cobalt	7440-48-4	D	LC	16	15	5.60E-05	9.30E-04	6.0E-03	NC	1.6E-01
on	SWMU 23	INORG	Copper	7440-50-8	D	D	16	7	9.00E-04	1.20E-03	1.3E+00	SM	9.2E-04
on	SWMU 23	INORG	Iron	7439-89-6	D	D	16	2	1.70E-02	2.20E-02	1.4E+01	NC	1.6E-03
on	SWMU 23	INORG	Lead	7439-92-1	D	B2	16	10	1.20E-04	4.20E-04	1.5E-02	SM	2.8E-02
on	SWMU 23	INORG	Manganese	7439-96-5	D	D	16	8	1.30E-03	5.50E-01	4.8E-01	NC	**1.1E+00**
on	SWMU 23	INORG	Nickel	7440-02-0	D	A	16	16	5.60E-04	4.40E-03	4.0E-01	NC	1.1E-02
on	SWMU 23	INORG	Selenium	7782-49-2	D	D	16	14	2.60E-04	1.70E-03	5.0E-02	SM	3.4E-02
on	SWMU 23	INORG	Silver	7440-22-4	D	D	16	2	2.00E-05	2.30E-05	1.0E-01	NC	2.3E-04
on	SWMU 23	INORG	Thallium	7440-28-0	D	ID	16	8	1.10E-04	3.50E-04	2.0E-03	SM	1.8E-01
on	SWMU 23	INORG	Vanadium	7440-62-2	D	ID	16	9	2.60E-04	2.50E-03	1.0E-01	NC	2.5E-02
on	SWMU 23	INORG	Zinc	7440-66-6	D	ID	16	1	7.40E-03	7.40E-03	6.0E+00	NC	1.2E-03
on	Unassigned	VOC	Tetrachloroethene	127-18-4	T	LC	24	4	1.20E-03	2.00E-03	5.0E-03	SM	4.0E-01
on	Unassigned	VOC	Trichloroethene	79-01-6	T	HC	24	1	1.50E-04	1.50E-04	5.0E-03	SM	3.0E-02
on	Unassigned	VOC	Vinyl Chloride	75-01-4	T	A	24	1	4.30E-04	4.30E-04	2.0E-03	SM	2.2E-01
on	Unassigned	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	24	3	2.00E-03	5.50E-03	6.0E-03	SM	9.2E-01
on	Unassigned	SVOC	Butylbenzylphthalate	85-68-7	T	C	24	2	2.20E-04	4.70E-04	4.1E-01	C	1.1E-03
on	Unassigned	SVOC	Diethylphthalate	84-66-2	T	D	24	9	3.10E-04	8.10E-04	1.6E+01	NC	5.1E-05
on	Unassigned	SVOC	Di-n-butylphthalate	84-74-2	T	D	24	2	4.10E-04	4.20E-04	2.0E+00	NC	2.1E-04
on	Unassigned	SVOC	Naphthalene	91-20-3	T	C	24	1	1.50E-04	1.50E-04	4.0E-01	NC	3.8E-04
on	Unassigned	SVOC	Phenol	108-95-2	T	ID	24	6	3.50E-04	6.80E-04	6.0E+00	NC	1.1E-04
on	Unassigned	INORG	Aluminum	7429-90-5	D	ID	24	2	9.20E-03	2.40E-01	2.0E+01	NC	1.2E-02
on	Unassigned	INORG	Antimony	7440-36-0	D	ID	24	11	1.70E-04	4.70E-04	6.0E-03	SM	7.8E-02
on	Unassigned	INORG	Arsenic	7440-38-2	D	A	24	24	5.70E-04	7.20E-03	1.0E-02	SM	7.2E-01
on	Unassigned	INORG	Barium	7440-39-3	D	NC	24	24	2.00E-02	4.30E-01	2.0E+00	SM	2.2E-01
on	Unassigned	INORG	Beryllium	7440-41-7	D	B1	24	15	5.40E-05	9.40E-04	4.0E-03	SM	2.4E-01
on	Unassigned	INORG	Cadmium	7440-43-9	D	B1	24	8	7.50E-05	2.30E-04	5.0E-03	SM	4.6E-02
on	Unassigned	INORG	Chromium (total)	7440-47-3	D		24	13	1.10E-03	3.00E-02	1.0E-01	SM	3.0E-01
on	Unassigned	INORG	Cobalt	7440-48-4	D	LC	24	21	1.80E-04	9.30E-04	6.0E-03	NC	1.6E-01
on	Unassigned	INORG	Copper	7440-50-8	D	D	24	4	8.80E-04	1.40E-03	1.3E+00	SM	1.1E-03
on	Unassigned	INORG	Iron	7439-89-6	D	D	24	4	1.40E-01	2.20E+00	1.4E+01	NC	1.6E-01
on	Unassigned	INORG	Lead	7439-92-1	D	B2	24	7	1.30E-04	3.20E-04	1.5E-02	SM	2.1E-02
on	Unassigned	INORG	Manganese	7439-96-5	D	D	24	24	1.20E-03	2.50E-01	4.8E-01	NC	5.2E-01
on	Unassigned	INORG	Mercury	7439-97-6	D	D	24	1	9.20E-05	9.20E-05	2.0E-03	SM	4.6E-02
on	Unassigned	INORG	Nickel	7440-02-0	D	A	24	23	2.90E-04	1.50E-02	4.0E-01	NC	3.8E-02
on	Unassigned	INORG	Selenium	7782-49-2	D	D	24	15	2.90E-04	7.00E-04	5.0E-02	SM	1.4E-02
on	Unassigned	INORG	Thallium	7440-28-0	D	ID	24	3	9.20E-05	1.40E-04	2.0E-03	SM	7.0E-02
on	Unassigned	INORG	Vanadium	7440-62-2	D	ID	24	11	2.90E-04	2.50E-03	1.0E-01	NC	2.5E-02
on	Unassigned	INORG	Zinc	7440-66-6	D	ID	24	1	9.80E-03	9.80E-03	6.0E+00	NC	1.6E-03

Notes:

Only constituents detected in each area are shown.

The drinking water criteria are based on the following hierarchy: State Maximum Contaminant Level (MCL), Federal MCL, USEPA Regional Screening Level (RSL) Tap Water Ingestion value (November 2015) at the lower of the criteria calculated at either the target cancer risk of 1E-5 or target hazard quotient of 1.

The criteria for Chromium (total) are the criteria provided by the agency for Chromium VI.

Ratios of concentration to the criteria greater than 1 are shaded in bold.

SM - The criterion is the State MCL.

C - The criterion is based on cancer risk at a target cancer risk of 1E-5.

NC - The criterion is based on noncancer effects at a hazard quotient of 1.

Chem Group - chemical group

Meas Basis - measured basis; T = total, D = dissolved

Carc Class - USEPA Weight-of-Evidence Cancer Classification

Table B-1b: Groundwater Samples Exceeding Screening Criteria Bway Corporation, Cincinnati, Ohio													
On/Off Site	**Area**	**Location**	**Sample ID**	**Sample Type**	**Sample Date**	**Chem Group**	**Chemical**	**CASRN**	**Meas Basis**	**Conc** (mg/L)	**Qual**	**Drinking Water Criteria** (mg/L)	**Ratio of Conc to Drinking Water Criteria**
on	SWMU 23	OW-3	OW-3/091714	N	09/17/14	VOC	Trichloroethene	79-01-6	T	2.90E-02		5.0E-03	**5.8E+00**
on	SWMU 23	OW-3	OW-3/121614	N	12/16/14	VOC	Trichloroethene	79-01-6	T	1.10E-02		5.0E-03	**2.2E+00**
on	SWMU 23	OW-3	OW-3/121614	N	12/16/14	INORG	Manganese	7439-96-5	D	5.10E-01	B	4.8E-01	**1.1E+00**
on	SWMU 23	OW-3	OW-3/030915	N	03/09/15	VOC	Trichloroethene	79-01-6	T	1.10E-02		5.0E-03	**2.2E+00**
on	SWMU 23	OW-3	OW-3/030915	N	03/09/15	INORG	Manganese	7439-96-5	D	5.50E-01		4.8E-01	**1.1E+00**
on	SWMU 23	OW-3	OW-3/051915	N	05/19/15	VOC	Trichloroethene	79-01-6	T	2.00E-02		5.0E-03	**4.0E+00**

Notes:

B = Estimated result. The result is less than the reporting limit.

Appendix III

CA750 Environmental Indicator Supporting Documentation

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Ground Water Under Control

Facility Name:	**Bway Corporation**
Facility Address:	**8200 Broadwell Road, Cincinnati, Ohio**
Facility EPA ID #:	**OHD 004 253 225**

1. *Has **all** available relevant/significant information on known and reasonably suspected releases to the ground water media, subject to RCRA Corrective Action [e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)], been **considered** in this EI determination?*

__**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.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

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

Definition of "Migration of Contaminated Ground Water Under Control" EI

A positive "Migration of Contaminated Ground Water Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" ground water has stabilized, and that monitoring will be conducted to confirm that contaminated ground water remains within the original "area of contaminated ground water" (for all ground water "contamination" subject to RCRA corrective action at or from the identified facility [i.e., site-wide)].

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, (GPRA). The "Migration of Contaminated Ground Water Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within ground water (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated ground water to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Migration of Contaminated Ground Water Under Control
Environmental Indicator (EI) RCRIS code (CA750)

This Resource Conservation and Recovery Act (RCRA) CA750 form was prepared to document ground water conditions at and in the vicinity of the Bway Corporation (Bway) site (Figure 1). During the RCRA facility investigation (RFI), conducted in accordance with a RCRA corrective action Administrative Order on Consent (Order) dated September 13, 2007, Bway collected data for characterizing ground water quality as part of the assessment of potential releases of hazardous waste and/or hazardous constituents at the Site. This form was initially submitted to USEPA as part of the Corrective Measures Proposal dated September 29, 2009. USEPA provided comments on the CA750 in a letter dated January 9, 2014 indicating additional characterization was warranted for groundwater. The USEPA provided specific requirements for the additional groundwater investigation activities in a letter dated May 22, 2014. In response to the USEPA request, Bway installed six additional groundwater monitoring wells in August 2014 and conducted supplemental groundwater monitoring from September 2014 to May 2015 consisting of the collection of four confirmatory rounds of groundwater data as discussed in more detail below.

The RFI Sampling and Analysis Plans (SAPs) were submitted to and reviewed with United States Environmental Protection Agency (U.S. EPA) prior to their implementation. The field investigations were conducted in accordance with these work plans, except where field conditions necessitated changes as discussed in the quarterly reports, SAP 1 (Payne Firm, 2008c), SAP 2 (Payne Firm, 2008d), and SAP 3 (Payne Firm, 2008f). The data collected during the RFI and a discussion of the data collection activities are provided in the quarterly reports. The data collected during each stage of the field investigation were previously reviewed with U.S. EPA. A meeting was held on April 15, 2014 at the USEPA office in Chicago with the Bway Corporation Team to discuss USEPA's request for additional ground-water characterization at the Bway facility. The April meeting resulted from Bway's request to further discuss the Agency's comments provided in its letter of January 9, 2014. TRC also provided USEPA with the supplemental file review documenting additional sources of VOCs in the upgradient vicinity (Appendix C). The supplemental groundwater investigation was conducted in accordance with SAP #4 (TRC, 2014), which was approved by USEPA on July 9, 2014 and initiated in August 2014 as described below for the “Supplemental Groundwater Investigation.”

This CA750 form includes an evaluation of the ground water data collected by Bway through 2015. The information provided herein and the site-specific references listed at the end of this form provide the basis for this EI determination.

2. *Is **ground water** known or reasonably suspected to be **“contaminated”**[1] above appropriately protective “levels” (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?*

__X__ If yes – continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

_____ If no – skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that ground water is not “contaminated.”

_____ If unknown – skip to #8 and enter “IN” status code.

Rationale and Reference(s):

The comparison of ground water monitoring data with conservative screening criteria to identify ground water meeting the definition of “contaminated” is summarized in Tables 2-1a and 2-1b. The screening

Footnotes:

[1]“Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate “levels” (appropriate for the protection of the ground water resource and its beneficial uses).

criteria and the results of the comparison of ground water characterization data are discussed below. All RFI ground water data were validated by The Payne Firm, Inc. (Payne Firm) in accordance with the RFI QAPP (Payne Firm 2008g).

A comprehensive discussion on the physical setting including descriptions of the site location, the surrounding land use, demographics, climate, water use in the area, topography and surface water drainage, and general geologic and hydrogeologic setting was presented in the U.S. EPA RCRA Corrective Action Current Conditions Report (CCR; Payne 2007b); a brief summary is provided below.

HYDROGEOLOGIC SUMMARY

- The site is underlain by the Little Miami River Buried Valley Aquifer and sits within the Little Miami River Watershed. The Little Miami River flows southwest of the site. Based on maps published by the Ohio EPA, the Facility is not located within a well field protection district.
- The Facility is located over a buried valley which is approximately 100 feet thick and 1 mile wide assigned to a portion of the U.S. EPA designated Greater Miami Sole Source Aquifer system.
- The unconsolidated deposits beneath the facility and in the vicinity of the Property generally consist of about 80 feet of sand and gravel deposits overlying about 30 feet of fine-grained, very-low permeability, glacial tills on top of bedrock.
- The underlying bedrock is composed of interbedded layers of shale and limestone belonging to the Kope Formation of Ordovician Age. The bedrock typically yields less than 5 gallons per minute to drilled wells and is not considered to be a significant aquifer.
- The direction of ground water movement in the vicinity of the Facility was determined to be northwest towards the adjacent flooded quarry pond.
- The rate of ground water movement under the Facility is in the range of 1 to 10 feet per day.
- Cross Section A-B (north-south alignment) provided on Figure 4 and Appendix B, shows the geologic conditions of the buried valley in the vicinity of the Facility. In general, the unconsolidated materials consist of the glacial outwash sand and gravel overlying a continuous layer of fine-grained glacial till deposits on top of bedrock.

WASTEWATER SUMMARY

- Prior to the construction of the land-application treatment system in 1987, the Facility industrial wastewater treatment consisted of chromium reduction, pH adjustment, flocculation, and settling.
- The former effluent from the Facility industrial wastewater treatment was characterized by high concentrations of COD, dissolved solids, sulfates, chlorides, and fluorides.

GROUND WATER CHARACTERIZATION

A) <u>Initial Ground Water RFI (2007-2013)</u>

- Ground water characterization data have been collected from three on-site monitoring wells and six off-site pore water piezometer locations. As discussed in the CCR (Payne Firm, 2007b), the three monitoring wells were installed in 1990 within the slow rate spray application system area (SWMU #23). The slow rate spray application system (SARS) is currently used for the application of treated waters stored in the Storage Pond (SWMU #22), which receives treated effluent from the Biological Treatment Plant (SWMU #20) and Wet Well (SWMU #21). See Figure 2 for locations of SWMUs, AOCs and AOIs. The three monitoring wells present in SWMU #23 include one upgradient well (OW-1) one downgradient well (OW-2) and one background well (OW-3). The wells are installed in unconsolidated sand and gravel deposits and are used to monitor the ground water table, which is approximately 50 to 70 feet below the ground surface in that area. Ground water flow is generally to the northwest toward the closed quarry pond as shown on Figure 3. The monitoring wells have been monitored periodically since 1990, with the most recent sampling completed in September 2008. Quarterly ground water data collected from the most recent sampling events (August 2007 to September 2008) are evaluated for the purposes of this CA750 determination.

- As discussed in SAP #3 (Payne Firm, 2008), six temporary pore water piezometers were installed downgradient of the site within the adjacent closed quarry pond and sampled in September and December 2008 to assess water quality in the ground water/surface water transition zone. The piezometers were installed near the shore and included shallow (0-0.5 feet below sediment surface) and deep (to refusal which ranged from 3.5 to 8.0 feet below ground surface) sampling depths as depicted on Figure 3.

B) <u>Supplemental Ground Water Investigation (2014/2015)</u>

During August, 2014, TRC completed the scope of work below in response to comments and "Requirements for Additional Work" provided in USEPA's correspondence dated May 22, 2014. The below scope of work was submitted for USEPA's review on June 20, 2014 as "Sampling and Analysis Plan #4." USEPA subsequently provided their approval of SAP-4 on July 9, 2014.

- Four new water-table ground-water monitoring wells were installed at prescribed locations on the Bway site referenced in USEPA's May 22, 2014 letter.
- As indicated in well logs submitted by Bway and reviewed by USEPA, the saturated thickness in the water-table aquifer below the facility is in the range of ten to fifteen feet thick. Per USEPA's request, should the saturated interval at any of the proposed well locations cited above exceed twenty feet in thickness, Bway shall install a well pair at that location. The well pair shall consist of one well screened across the water table and a second well with a five-foot screen which terminates at the top of the underlying clay. The depth to the groundwater table is approximately 50 to 70 feet below the ground surface in that area of the Facility. Groundwater flow is generally to the northwest toward the inactive quarry pond as shown on Figure 1. Two of the four prescribed locations required a well pair to be installed, for a total of six new wells.
- A total of six new observation wells were installed following the procedures outlined in SAP #4, including OW-4, OW-5, OW-6, OW-6D, OW-7 and OW-7D. The locations of all monitoring wells installed as part of the supplemental ground water monitoring investigation are provided on Figure 1 of Appendix A. The updated geologic cross-section depicting all wells installed at the site is provided as Figure 2 of Appendix A.

KEY CONTAMINANTS

A) <u>Initial Ground Water Monitoring (2007-2013)</u>

Table 2-1a presents the constituents detected in ground water at each monitoring location and, the detection frequencies, the ranges of detected concentrations, and ratios of the highest measured concentrations with screening criteria selected based on the potential potable use of the ground water in the region (specifically, Ohio MCLs, federal MCLs where Ohio MCLs do not exist, or Region 9 tap water ingestion values where no MCLs exist). The use of drinking water criteria for this CA750 determination is conservative, because no active water supply well exists at the Site and an extensive review of water use records during the RFI identified only one historic well (installed in 1955), within the same aquifer system as the Site (CCR Figure 5; Payne Firm, 2007b). However, there are no residential or industrial buildings immediately downgradient of the Site that would use this well. Discussions with the Ohio Department of Health and the Hamilton County Department of Health in September 2015 verified that there are no records of this well being in use. In addition, a visit in October 2015 with a representative of USEPA to the parcel where the well was formerly located indicated that the property is currently a gravel pit with no residential structure present. Therefore, there is no active potable wells downgradient of the site. Potable water at and around the Site is supplied by the City of Cincinnati.

Ground water that meets the definition of "contamination" is identified on Tables 2-1a by comparing the highest concentration of each constituent at a location to the drinking water screening criteria. The presence of ground water that meets the definition of "contamination" is identified by ratios of concentrations to the screening criteria that exceed 1. As shown on Table 2-1a, a limited number of constituents have concentrations in on-site ground water that are higher than the drinking water screening criteria. The ground water contaminants are as follows:

- ON-SITE: arsenic, chromium (total), iron, lead, manganese, thallium, trichloroethene (TCE)

- OFF-SITE: thallium

As shown on Table 2-1b, ground water that meets the definition of "contamination" is limited, with concentrations of constituents that exceed the drinking water criteria not consistently detected spatially or temporally.

B) **Supplemental Ground Water Monitoring (2014/2015)**

A comparison of all groundwater data collected as part of the supplemental monitoring conducted from September 2014 to May 2015 is provided on Tables B-1a and B-1b of Appendix B. The results for the supplemental groundwater monitoring wells installed in August 2014 are summarized under "Unassigned" on Table B-1a.

As presented in Appendix B, the monitoring results for the last four quarters of monitoring are compared with criteria based on potential potable use of groundwater (specifically, Ohio MCLs, federal MCLs where Ohio MCLs do not exist, or USEPA November 2015 Regional Screening Levels where MCLs do not exist). Table B-1a provides a comparison of maximum detected concentrations of constituents to the groundwater screening criteria. Table B-1b provides a sample-by-sample comparison to the groundwater screening criteria. As presented on Table B-1a, the maximum concentrations of two constituents, TCE and manganese, are higher than the drinking water screening criteria. As shown on Table B-1b, these constituents were only detected above the screening criteria in the background monitoring well, OW-3, the eastern most monitoring well on the site. Based on consistent groundwater flow direction to the northwest and information available for the adjacent facility, concentrations of TCE and manganese likely originated from an upgradient, off-site source (see Appendix C).

Based on the low levels of constituents detected in ground water at the Site, and the presence of an upgradient off-site source, there is no evidence of site-related releases to ground water subject to RCRA Corrective Action. For purposes of answering Question 2, however, no distinction is made between concentrations that represent site-related impacts and concentrations that represent contributions from other potential sites.

3. *Has the **migration** of contaminated ground water **stabilized** (such that contaminated ground water is expected to remain within "existing area of contaminated ground water"[2] as defined by the monitoring locations designated at the time of this determination)?*

__**X**__ If yes – continue, after presenting or referencing the physical evidence (e.g., ground water sampling/measurement/migration barrier data) and rationale why contaminated ground water is expected to remain within the (horizontal or vertical) dimensions of the "existing area of ground water contamination"[2]).

_____ If no (contaminated ground water is observed or expected to migrate beyond the designated locations defining the "existing area of ground water contamination"[2]) – skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown – skip to #8 and enter "IN" status code.

[2] "existing area of contaminated ground water" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant ground water contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" ground water remains within this area, and that the further migration of "contaminated" ground water is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

Rationale and Reference(s):

Ground water with concentrations that meet the definition of "contaminated" has been characterized and delineated and is expected to remain within the currently affected areas. In addition, based on a review of the recent supplemental ground water monitoring data, TCE and manganese are the only constituents that have been consistently detected above levels used to identify "contamination." However, based on monitoring of the background well OW-3 for the Site, the detected TCE and manganese concentrations have been determined to be a result of an upgradient off-site source presented in Appendix C.

Ground water sampling conducted downgradient of the Site has demonstrated that migration of the TCE and manganese contamination has not migrated further downgradient of the Site. Additionally, any migration would effectively be intercepted by the quarry pond directly west of the site (See Figures 3 and 4). Therefore, the direct sampling results and presence of the downgradient quarry pond effectively delineate the area of ground water impact from the upgradient source. As a result, stability of the area of contamination has been met in accordance with the definition for this environmental indicator (see footnote 2 below).

The evidence to support this conclusion is discussed in more detail below.

- Based on the final round of ground water verification sampling data collected in May 2015, the only constituents detected above the drinking water criteria were TCE and manganese, which were detected in the background well OW-3, the eastern most monitoring well on the site (see Figure 1 of Appendix A). As discussed in the CCR (Payne Firm, 2007b), based on consistent ground water flow direction to the northwest and information available for the adjacent facility, the TCE and manganese in OW-3 likely originated from an upgradient off-site source (Appendix C).
- In addition, with the exception of thallium detected at PW-06 (see Figure 3) in the dissolved sample only (but not detected in the duplicate sample or the unfiltered sample from the same location) there were no exceedances of the drinking water criteria identified in the downgradient piezometers. Thallium was also detected at least once in the background well OW-3 above drinking water criteria.
- Results of the RFI were provided in quarterly progress reports submitted for EPA's review during 2007-2015 and completed in May 2015 following EPA's request to verify four additional quarters of confirmatory groundwater sampling events.

4. *Does "contaminated" ground water **discharge** into **surface water** bodies?*

__X__ If yes – continue after identifying potentially affected surface water bodies.

_____ If no – skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that ground water "contamination" does not enter surface water bodies.

_____ If unknown – skip to #8 and enter "IN" status code.

Rationale and Reference(s):

<u>Potentially affected surface water bodies</u>

The nearest downgradient surface water body is the closed quarry pond, which is adjacent to and west of the Facility (see Figure 3). Ground water on-site meets the definition of "contaminated" and shallow ground water discharges to the adjacent closed quarry pond. However, there is no evidence from direct sampling during the RFI that site releases have impacted ground water, or off-site surface water in the adjacent downgradient quarry pond.

5. *Is the* ***discharge*** *of "contaminated" ground water into surface water likely to be* ***"insignificant"*** *(i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate ground water "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?*

__X__ If yes – skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>key</u> contaminants discharged above their ground water "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgment/explanation (or reference documentation) supporting that the discharge of ground water contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no – (the discharge of "contaminated" ground water into surface water is potentially significant) – continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of <u>each</u> contaminant discharged above its ground water "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate ground water "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown – enter "IN" status code in #8.

Rationale and Reference(s):

According to the ground water characterization discussion in Question 2 above, ground water in the aquifer beneath the Facility does not have constituent concentrations that are greater than ten times the MCL. In addition, there is no evidence of site-related releases to ground water. Consequently, discharge of contaminated ground water into the adjacent quarry pond is insignificant. Furthermore, with the exception of a potential anomalous detection of thallium in PW-06, there were no exceedances of the drinking water criteria identified in the downgradient pore water piezometers installed along the adjacent quarry pond (see Figure 3).

Therefore, discharge of ground water into the surface water is not anticipated to have unacceptable impacts to surface water or sediment in the adjacent downgradient quarry pond.

[3] As measured in ground water prior to entry to the ground water-surface water/sediment interaction (e.g., hyporheic) zone.

6. *Can the **discharge** of "contaminated" ground water into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?*

_____ If yes – continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging ground water; OR 2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of ground water contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging ground water) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no – (the discharge of "contaminated" ground water can not be shown to be "**currently acceptable**") – skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown – skip to 8 and enter "IN" status code.

Rationale and Reference(s):

Skip to Question 7

[4] Note, because areas of inflowing ground water can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing ground water flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated ground water discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. *Will ground water **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated ground water has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated ground water?"*

______ If yes – continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that ground water contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of ground water contamination."

__**X**__ If no – enter "NO" status code in #8

______ If unknown – enter "IN" status code in #8.

Rationale and Reference(s):

Results of the RFI were provided in quarterly progress reports submitted for EPA's review during 2007-2015 and completed in May 2015 following EPA's request to verify four additional quarters of confirmatory groundwater sampling events. As documented in RFI progress reports, EI reports and the ERA, no significant Facility-related releases of hazardous waste and/or hazardous constituents were identified during the RFI; although, hazardous constituents have been detected in groundwater on the Facility from an upgradient off-site source (see Appendix C). Because the presence of VOCs in groundwater is not Facility-related, Bway will implement a corrective measure that relies on institutional controls to reduce potential exposures to groundwater in the vicinity of OW-3 at the Facility.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

X YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the (FACILITY NAME, EPA ID #, LOCATION). Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

___ NO - Unacceptable migration of contaminated groundwater is observed or expected.

___ IN - More information is needed to make a determination.

Completed by: (signature) Date 9/15/2016

(print) Juan Thomas

(title) Environmental Scientist

Supervisor: (signature) Date 10/6/16

(print) Gregory Rudloff

(title) Acting Section Chief

EPA Region 5

Locations where References may be found:

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Tables

Table 2-1a	Ground Water Screening Results Summary
Table 2-2b	Ground Water Samples Exceeding the Screening Criteria

Figures

Figure 1	Bway Facility Location
Figure 2	Locations of SWMUs, AOCs, and AOIs
Figure 3	RFI Sampling Locations and Ground Water Contours
Figure 4	Geologic Cross-Section A to B

Appendix

Appendix A	Supplemental Groundwater Investigation Figures
Appendix B	Supplemental Groundwater Monitoring Results Tables
Appendix C	Supplemental File Review Documentation

References

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Appendix III
CA750 Environmental Indicator Supporting Documentation

Tables

Table 2-1a	Ground Water Screening Results Summary
Table 2-2b	Ground Water Samples Exceeding the Screening Criteria

Figures

Figure 1	Bway Facility Location
Figure 2	Locations of SWMUs, AOCs, and AOIs
Figure 3	RFI Sampling Locations and Ground Water Contours
Figure 4	Geologic Cross-Section A to B

Appendix

Appendix A	Supplemental Groundwater Investigation Figures
Appendix B	Supplemental Groundwater Monitoring Results Tables
Appendix C	Supplemental File Review Documentation

Tables

Table 2-1a: Groundwater Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria
on	SWMU 23	VOC	1,1,1-Trichloroethane	71-55-6	T	ID	20	2	3.20E-04	3.50E-04	2.0E-01	SM	1.8E-03
on	SWMU 23	VOC	Trichloroethene	79-01-6	T	C-B2	20	5	1.70E-02	3.40E-02	5.0E-03	SM	**6.8E+00**
on	SWMU 23	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	18	1	2.10E-03	2.10E-03	6.0E-03	SM	3.5E-01
on	SWMU 23	INORG	Aluminum	7429-90-5	T	ID	18	13	2.52E-01	5.47E+00	3.7E+01	NC	1.5E-01
on	SWMU 23	INORG	Antimony	7440-36-0	T		18	1	4.50E-03	4.50E-03	6.0E-03	SM	7.5E-01
on	SWMU 23	INORG	Arsenic	7440-38-2	T	A	18	7	3.80E-03	1.34E-02	1.0E-02	SM	**1.3E+00**
on	SWMU 23	INORG	Barium	7440-39-3	T	NC	18	8	3.91E-02	7.87E-02	2.0E+00	SM	3.9E-02
on	SWMU 23	INORG	Chromium (total)	7440-47-3	T		18	6	4.30E-03	3.29E-01	1.0E-01	SM	**3.3E+00**
on	SWMU 23	INORG	Cobalt	7440-48-4	T	LC	18	3	3.10E-03	3.80E-03	7.3E-01	NC	5.2E-03
on	SWMU 23	INORG	Copper	7440-50-8	T	D	18	3	8.80E-03	1.00E-02	1.3E+00	SM	7.7E-03
on	SWMU 23	INORG	Iron	7439-89-6	T	D	18	15	9.39E-02	2.64E+01	1.1E+01	NC	**2.4E+00**
on	SWMU 23	INORG	Lead	7439-92-1	T	B2	18	5	3.10E-03	1.62E-02	1.5E-02	SM	**1.1E+00**
on	SWMU 23	INORG	Manganese	7439-96-5	T	D	18	14	6.70E-03	1.23E+00	8.8E-01	NC	**1.4E+00**
on	SWMU 23	INORG	Mercury	7439-97-6	T	D	18	2	1.20E-04	1.70E-04	2.0E-03	SM	8.5E-02
on	SWMU 23	INORG	Nickel	7440-02-0	T	A	18	5	3.20E-03	1.87E-01	7.3E-01	NC	2.6E-01
on	SWMU 23	INORG	Phosphorus (total)	7723-14-0	T		18	17	6.80E-02	7.80E-01			
on	SWMU 23	INORG	Thallium	7440-28-0	T		18	4	5.40E-03	1.62E-02	2.0E-03	SM	**8.1E+00**
on	SWMU 23	INORG	Vanadium	7440-62-2	T		18	3	5.60E-03	6.20E-03	3.7E-02	NC	1.7E-01
on	SWMU 23	INORG	Zinc	7440-66-6	T	ID	18	5	5.40E-03	1.08E-01	1.1E+01	NC	9.9E-03
off	AOI B	VOC	Chloroform	67-66-3	T	B2	7	2	3.90E-04	3.90E-04	8.0E-02	SM	4.9E-03
off	AOI B	VOC	Toluene	108-88-3	T	ID	7	1	2.70E-04	2.70E-04	1.0E+00	SM	2.7E-04
off	AOI B	SVOC	Benzo(b)fluoranthene	205-99-2	T	B2	7	1	4.80E-04	4.80E-04	9.2E-04	C	5.2E-01
off	AOI B	SVOC	Fluoranthene	206-44-0	T	D	7	2	2.40E-04	4.00E-04	1.5E+00	NC	2.7E-04
off	AOI B	SVOC	Pyrene	129-00-0	T	NC	7	1	2.10E-04	2.10E-04	1.1E+00	NC	1.9E-04
off	AOI B	INORG	Aluminum	7429-90-5	D	ID	7	1	1.46E-01	1.46E-01	3.7E+01	NC	4.0E-03
off	AOI B	INORG	Aluminum	7429-90-5	T	ID	7	4	1.27E-01	3.60E+00	3.7E+01	NC	9.9E-02
off	AOI B	INORG	Antimony	7440-36-0	T		7	1	1.90E-03	1.90E-03	6.0E-03	SM	3.2E-01
off	AOI B	INORG	Arsenic	7440-38-2	T	A	7	3	4.20E-03	7.80E-03	1.0E-02	SM	7.8E-01
off	AOI B	INORG	Barium	7440-39-3	D	NC	7	7	3.07E-02	7.33E-02	2.0E+00	SM	3.7E-02
off	AOI B	INORG	Barium	7440-39-3	T	NC	7	7	4.63E-02	7.17E-02	2.0E+00	SM	3.6E-02
off	AOI B	INORG	Chromium (total)	7440-47-3	D		7	1	3.40E-03	3.40E-03	1.0E-01	SM	3.4E-02
off	AOI B	INORG	Chromium III	16065-83-1	T	D	7	2	4.10E-03	1.24E-02	1.0E-01	SM	1.2E-01
off	AOI B	INORG	Chromium VI	18540-29-9	T	A	7	2	4.00E-03	9.00E-03	1.0E-01	SM	9.0E-02
off	AOI B	INORG	Cobalt	7440-48-4	T	LC	7	2	1.90E-03	3.40E-03	7.3E-01	NC	4.7E-03
off	AOI B	INORG	Copper	7440-50-8	T	D	7	3	6.80E-03	1.46E-02	1.3E+00	SM	1.1E-02
off	AOI B	INORG	Iron	7439-89-6	D	D	7	2	1.71E-01	5.57E-01	1.1E+01	NC	5.1E-02
off	AOI B	INORG	Iron	7439-89-6	T	D	7	5	8.49E-02	8.19E+00	1.1E+01	NC	7.5E-01
off	AOI B	INORG	Lead	7439-92-1	T	B2	7	3	2.30E-03	4.70E-03	1.5E-02	SM	3.1E-01
off	AOI B	INORG	Manganese	7439-96-5	D	D	7	6	6.90E-04	3.17E-01	8.8E-01	NC	3.6E-01
off	AOI B	INORG	Manganese	7439-96-5	T	D	7	5	9.40E-02	3.49E-01	8.8E-01	NC	4.0E-01
off	AOI B	INORG	Nickel	7440-02-0	T	A	7	3	5.40E-03	1.33E-02	7.3E-01	NC	1.8E-02
off	AOI B	INORG	Selenium	7782-49-2	D	D	7	1	4.30E-03	4.30E-03	5.0E-02	SM	8.6E-02
off	AOI B	INORG	Selenium	7782-49-2	T	D	7	1	4.60E-03	4.60E-03	5.0E-02	SM	9.2E-02

Table 2-1a: Groundwater Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria
off	AOI B	INORG	Thallium	7440-28-0	D		7	1	5.70E-03	5.70E-03	2.0E-03	SM	**2.9E+00**
off	AOI B	INORG	Vanadium	7440-62-2	T		7	3	3.40E-03	1.15E-02	3.7E-02	NC	3.2E-01
off	AOI B	INORG	Zinc	7440-66-6	T	ID	7	4	2.90E-02	7.20E-02	1.1E+01	NC	6.6E-03

Notes:

Only constituents detected in each area are shown.

The drinking water criteria are based on the following hierarchy: State MCL, Federal MCL, USEPA Region 9 Tap Water Ingestion value at the lower of the criteria calculated at either the target cancer risk of 1E-5 or target hazard quotient of 1*.

*United States Environmental Protection Agency (USEPA). 2004. Region 9 Preliminary Remediation Goals. October.

The criteria for Chromium (total) are the criteria provided by the agency for Chromium VI.

Ratios of concentration to the criteria greater than 1 are shaded in bold.

SM - The criterion is the State MCL.

C - The criterion is based on cancer risk at a target cancer risk of 1E-5.

NC - The criterion is based on noncancer effects at a hazard quotient of 1.

Chem Group - chemical group

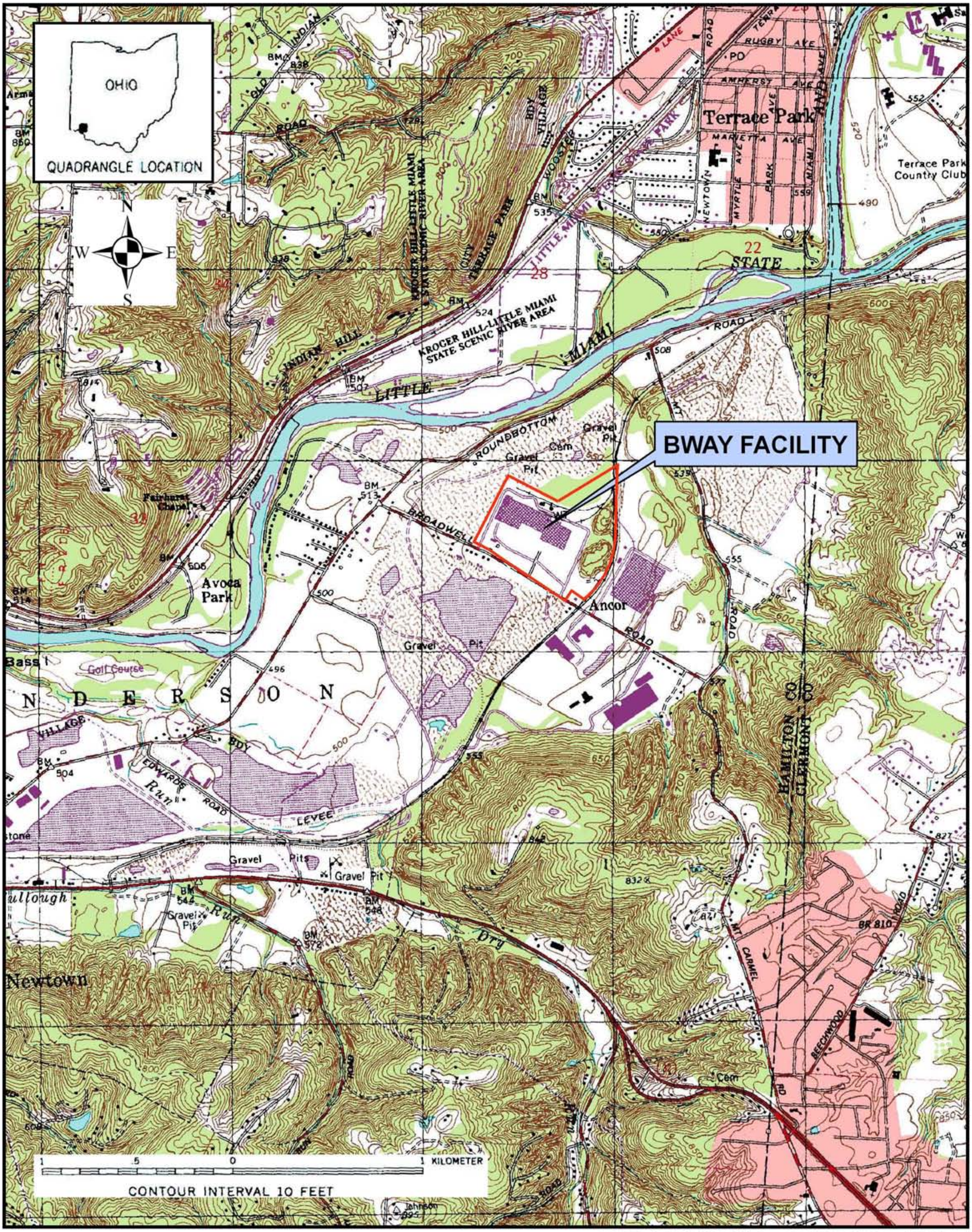
Meas Basis - measured basis; T = total, D = dissolved

Carc Class - USEPA Weight-of-Evidence Cancer Classification

Table 2-1b: Groundwater Samples Exceeding Screening Criteria
Bway Corporation, Cincinnati, Ohio

On/Off Site	Area	Location	Sample ID	Sample Type	Sample Date	Chem Group	Chemical	CASRN	Meas Basis	Conc (mg/L)	Qual	Drinking Water Criteria (mg/L)	Ratio of Conc to Drinking Water Criteria
off	AOI B	PW-06	PW06-092408	N	09/24/08	INORG	Thallium	7440-28-0	D	5.70E-03	B	2.0E-03	**2.9E+00**
on	SWMU 23	OW-1	OW-1/061608	N	06/16/08	INORG	Arsenic	7440-38-2	T	1.09E-02		1.0E-02	**1.1E+00**
on	SWMU 23	OW-1	DUP01/061608	FD	06/16/08	INORG	Thallium	7440-28-0	T	6.40E-03	B J	2.0E-03	**3.2E+00**
on	SWMU 23	OW-1	OW-1/061608	N	06/16/08	INORG	Thallium	7440-28-0	T	7.70E-03	B J	2.0E-03	**3.9E+00**
on	SWMU 23	OW-2	OW-2	N	08/15/07	INORG	Chromium (total)	7440-47-3	T	3.29E-01		1.0E-01	**3.3E+00**
on	SWMU 23	OW-2	OW-2/061608	N	06/16/08	INORG	Thallium	7440-28-0	T	5.40E-03	B J	2.0E-03	**2.7E+00**
on	SWMU 23	OW-3	OW-3	N	08/15/07	VOC	Trichloroethene	79-01-6	T	3.30E-02		5.0E-03	**6.6E+00**
on	SWMU 23	OW-3	OW-3	N	08/15/07	INORG	Arsenic	7440-38-2	T	1.34E-02		1.0E-02	**1.3E+00**
on	SWMU 23	OW-3	OW-3	N	08/15/07	INORG	Iron	7439-89-6	T	2.64E+01		1.1E+01	**2.4E+00**
on	SWMU 23	OW-3	OW-3	N	08/15/07	INORG	Lead	7439-92-1	T	1.62E-02		1.5E-02	**1.1E+00**
on	SWMU 23	OW-3	OW-3	N	08/15/07	INORG	Manganese	7439-96-5	T	1.23E+00		8.8E-01	**1.4E+00**
on	SWMU 23	OW-3	OW-3/122107	N	12/21/07	VOC	Trichloroethene	79-01-6	T	3.40E-02		5.0E-03	**6.8E+00**
on	SWMU 23	OW-3	OW-3/03172008	N	03/17/08	VOC	Trichloroethene	79-01-6	T	2.00E-02		5.0E-03	**4.0E+00**
on	SWMU 23	OW-3	OW-3/061608	N	06/16/08	VOC	Trichloroethene	79-01-6	T	1.70E-02		5.0E-03	**3.4E+00**
on	SWMU 23	OW-3	OW-3/061608	N	06/16/08	INORG	Thallium	7440-28-0	T	1.62E-02	J	2.0E-03	**8.1E+00**
on	SWMU 23	OW-3	OW-3/091108	N	09/11/08	VOC	Trichloroethene	79-01-6	T	2.40E-02		5.0E-03	**4.8E+00**

Figures



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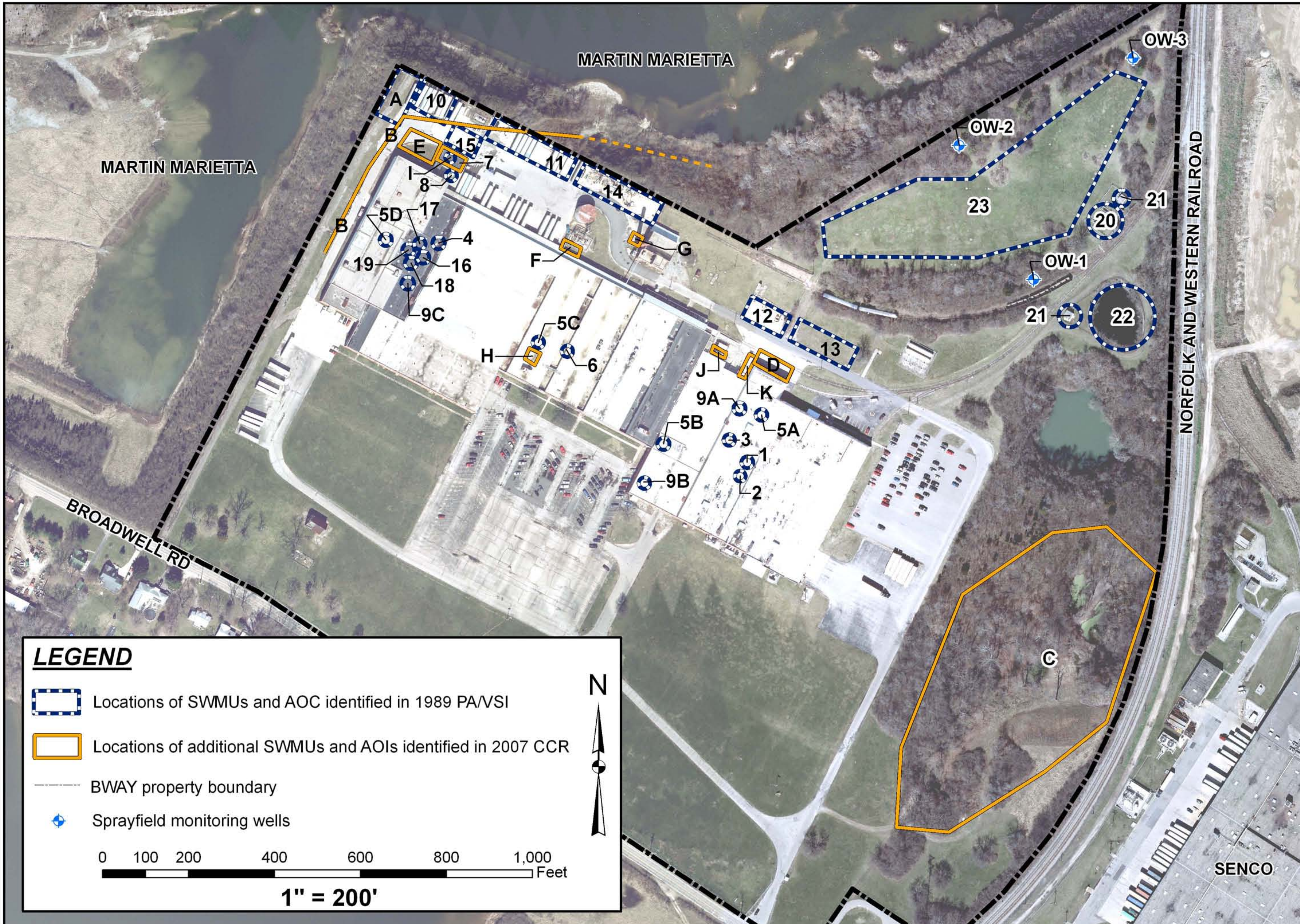
PROJECT BWAY - RCRA Corrective Action	FIGURE NO. 1	DATE 12/17/08	The Payne Firm, Inc. Environmental Consultants Cincinnati, OH / Cleveland, OH Chicago, IL / Troy, NY
TITLE BWAY Facility Location	DRAWN BY JAG	REQUESTED BY KDK	
	PROJECT NO. 654.13.07		

REFERENCE United States Geologic Survey (USGS) 7.5 Minute Quadrangle Map for Maderia, Ohio and Withamsville, Ohio (revised, 1999).



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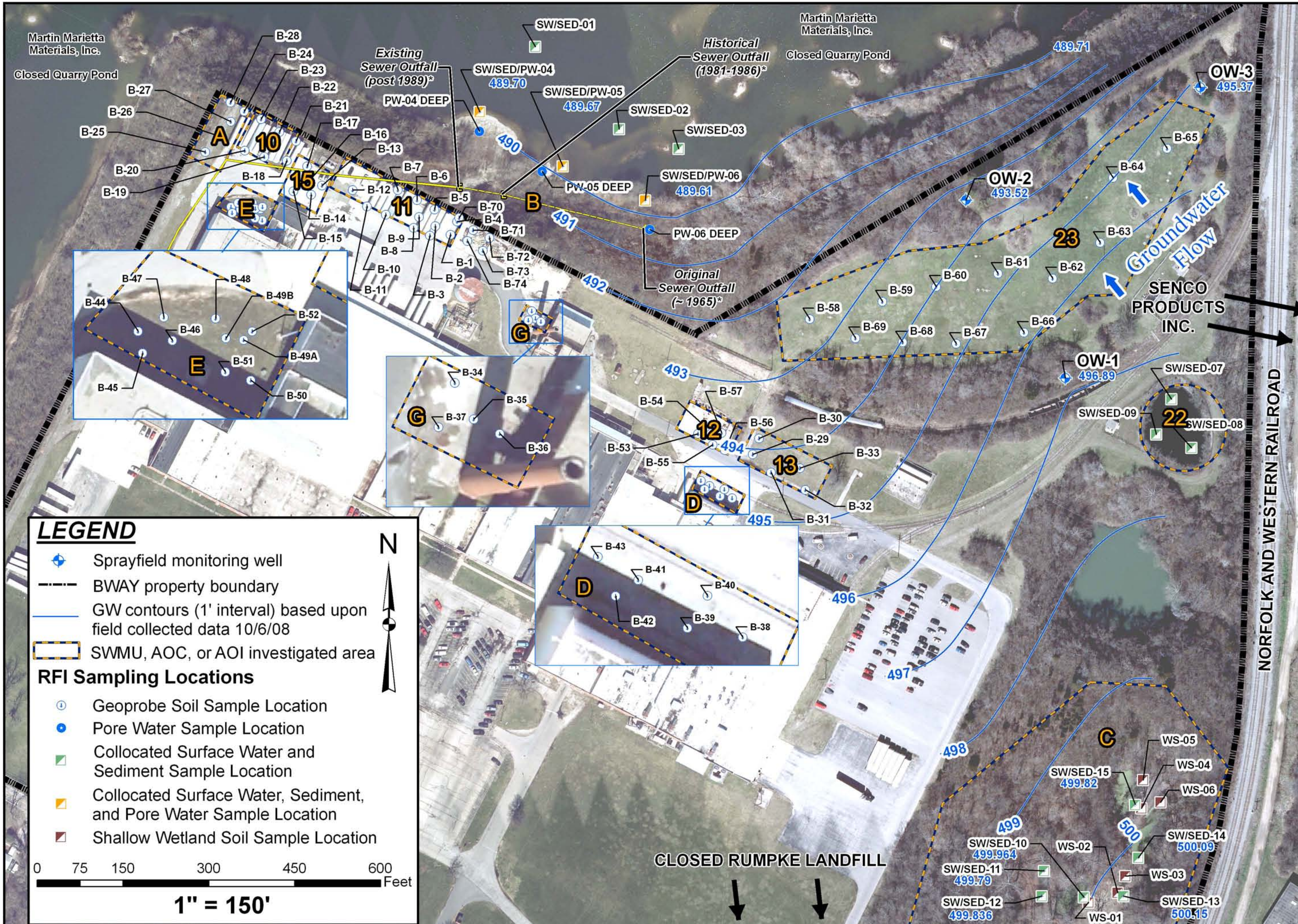
The Payne Firm, Inc.
Environmental Consultants
Cincinnati, OH / Cleveland, OH
Chicago, IL / Troy, NY

FIGURE NO. 2	DATE 12/17/08		
DRAWN BY JAG	REQUESTED BY KDK		
PROJECT NO. 654.13.07			

PROJECT BWAY - RCRA Corrective Action

TITLE Locations of SWMUs, AOCs, and AOIs

REFERENCE 2006 Orthophoto Courtesy CAGIS; 1989 PA/VSI Exhibits 3 and 4



PROJECT BWAY - RCRA Corrective Action

TITLE RFI Sampling Locations and Groundwater Contours

FIGURE NO.	3	DATE	12/17/2008
DRAWN BY	JAG	REQUESTED BY	KDK
PROJECT NO.	654.13.07		

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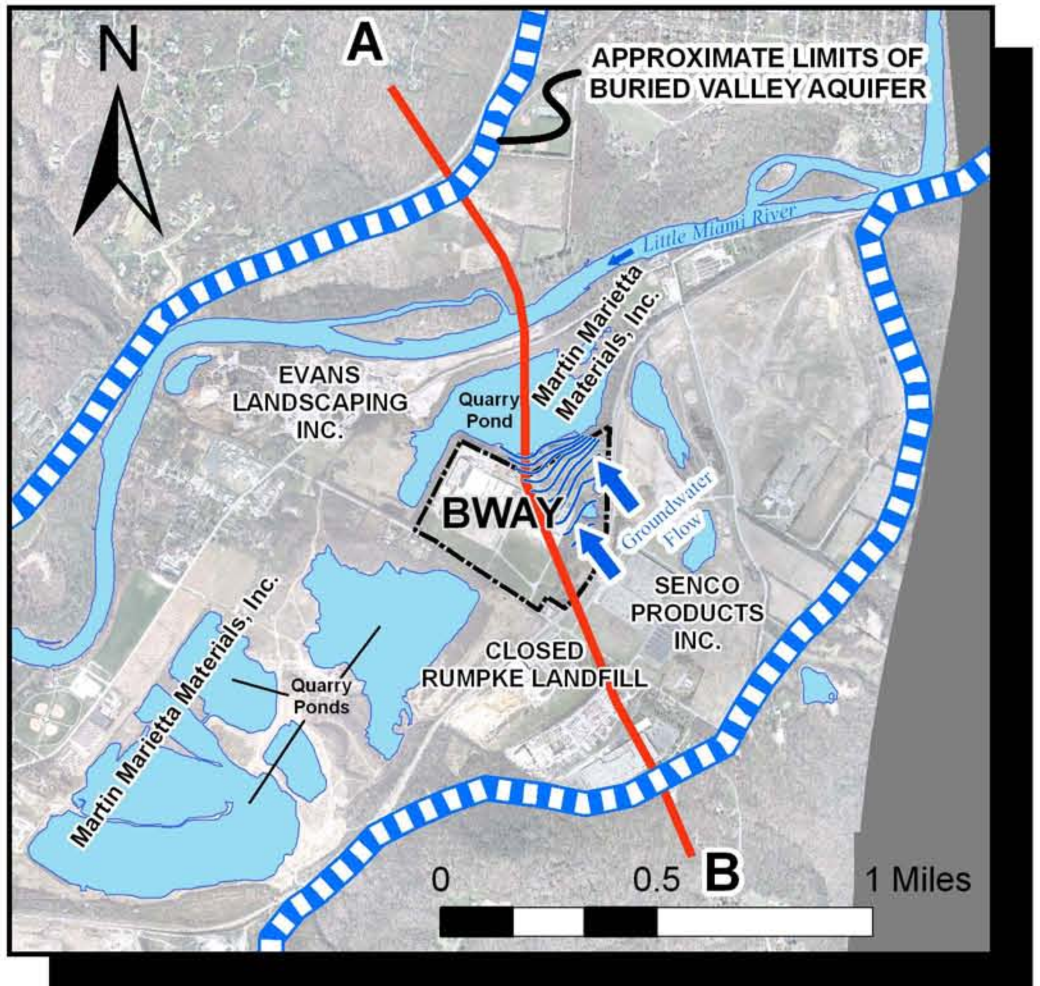
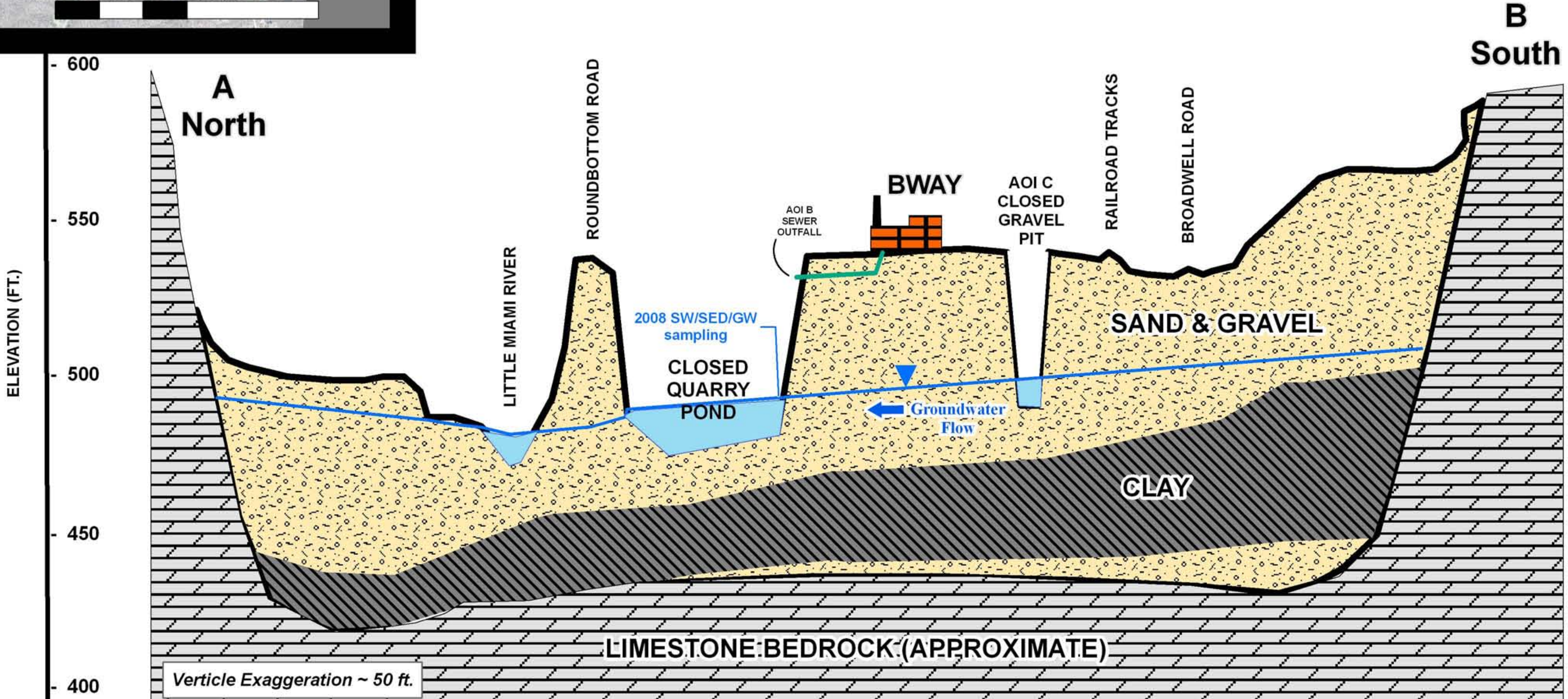
Environmental Consultants
Cincinnati, OH / Cleveland, OH
Chicago, IL / Troy, NY

G:\GIS_Projects\GIS_0654.13.00_Bway_CA\MXDs\CA725\Figure 3 GW_Flow_CA725.mxd



HYDROGEOLOGIC SUMMARY

- The site is underlain by the Little Miami River Buried Valley Aquifer and sits within the Little Miami River Watershed. The Little Miami River flows southwest of the site. Based on maps published by the Ohio EPA, the Facility is not located within a well field protection district.
- The Facility is located over a buried valley which is approximately 100 feet thick and 1 mile wide assigned to a portion of the U.S. EPA designated Greater Miami Sole Source Aquifer system.
- The unconsolidated deposits beneath the facility and in the vicinity of the Property generally consist of about 80 feet of sand and gravel deposits overlying about 30 feet of fine-grained, very-low permeability, glacial tills on top of bedrock.
- The underlying bedrock is composed of interbedded layers of shale and limestone belonging to the Kope Formation of Ordovician Age. The bedrock typically yields less than 5 gallons per minute to drilled wells and is not considered to be a significant aquifer.



modified from 1983 Burgess and Niple Hydrogeologic Investigation Report

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Environmental Consultants
Cincinnati, OH / Cleveland, OH
Chicago, IL / Troy, NY

FIGURE NO.	4
DATE	12/17/2008
DRAWN BY	JAG
REQUESTED BY	KDK
PROJECT NO.	654.13.08
PROJECT	BWAY - RCRA Corrective Action
TITLE	Geologic cross-section A to B

Appendix A

Supplemental Groundwater Investigation Figures

OW-6

DATE	T/D	AS	CR	FE	PB	MN	TL	PCE	TCE	VC
9/17/2014	T	1.4 J	18	1100	0.91 JB	44	0.12 JB	1.2	< 1 U	< 1 U
9/17/2014	D	0.84 JB	< 2 U	< 50 U	< 1 U	8	< 1 U	N/A	N/A	N/A
12/16/2014	T	1 J	15 Bj	310 Bu	0.27 JBj	13	< 1 U	1.8	0.15 J	< 1 U
12/16/2014	D	0.91 JB	1.3 JB	< 50 Uu	< 1 Uj	6 B	< 1 U	N/A	N/A	N/A
3/9/2015	T	<1.4 JBu	13 B	1000	0.84 JBu	34	< 1 U	1.8	< 1 U	< 1 U
3/9/2015	D	0.69 J	<1.4 JBu	< 50 U	< 1 U	5.1	< 1 U	N/A	N/A	N/A
5/19/2015		2.4 JB	19 B	2100	1.8	64	< 1 U	2	< 1 U	< 1 U
5/19/2015	D	1.2 JB	1.5 JB	< 50 U	0.17 JB	2 J	< 1 U	N/A	N/A	N/A

OW-2

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2.3 J	2.7	1500	2.8 B	72	1.5 B	< 1 U	< 1 U
9/17/2014	D	0.57 JB	< 2 U	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	5.2 Bj	3200 B	5.6 B	160	0.28 J	< 1 U	< 1 U
12/16/2014	D	0.65 JBj	1.2 J Bj	< 50 U	< 1 U	< 5 U	< 1 U	N/A	N/A
3/9/2015	T	4.2 JB	< 6.2 Bu	7100	6.1 B	390	0.088 J	< 1 U	< 1 U
3/9/2015	D	0.76 J	<1.4 JBu	< 50 U	0.26 J	1.3 J	0.3 J	N/A	N/A
5/19/2015	T	1.8 JB	2.6 B	2000 j	1.7	61	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.9 JB	1.6 JB	17 JB	0.42 JB	< 5 U	0.35 JB	N/A	N/A

OW-3

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	7.6	7.3	20000	11 B	1200	0.44 JB	29	< 1 U
9/17/2014	D	0.5 JB	< 2 U	< 50 U	< 1 U	320	< 1 U	N/A	N/A
12/16/2014	T	4.7 J	6.1 Bj	12000 B	6 B j	1400	0.12 J	11	< 1 U
12/16/2014	D	0.61 JBj	1.1 JBj	< 50 U	< 1 U	510 B	< 1 U	N/A	N/A
3/9/2015	T	4.5 JB	< 5.6 Bu	12000	6.5 B	890	0.096 J	11	< 1 U
3/9/2015	D	0.62 J	<1.3 JBu	< 50 U	0.13 J	550	0.11 J	N/A	N/A
5/19/2015	T	3.3 JB	4.7 B	8400	4.6	820	< 1 U	20	< 1 U
5/19/2015	D	1.1 JB	1.4 JB	< 50 U	0.25 JB	220	0.15 JB	N/A	N/A

OW-6D

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	13	35	3500	0.55 JB	240	0.12 JB	< 1 U	< 1 U
9/17/2014	D	7.2 B	30	2200	0.32 J	240	< 1 U	N/A	N/A
12/16/2014	T	9.1	44 B	2900 B	<0.33 JBu	240	< 1 U	< 1 U	< 1 U
12/16/2014	D	5.1 B	1.3 JBj	< 50 U	< 1 U	230 B	< 1 U	N/A	N/A
3/9/2015	T	13 B	45 B	4000	< 1 Bu	300	< 1 U	< 1 U	< 1 U
3/9/2015	D	6.4	<1.2 JBu	< 50 U	< 1 U	250	< 1 U	N/A	N/A
5/19/2015	T	8.1 B	2 B	1900	0.13 J	230	< 1 U	< 1 U	< 1 U
5/19/2015	D	5 B	2.6 B	140 B	0.17 JB	230	< 1 U	N/A	N/A

OW-4

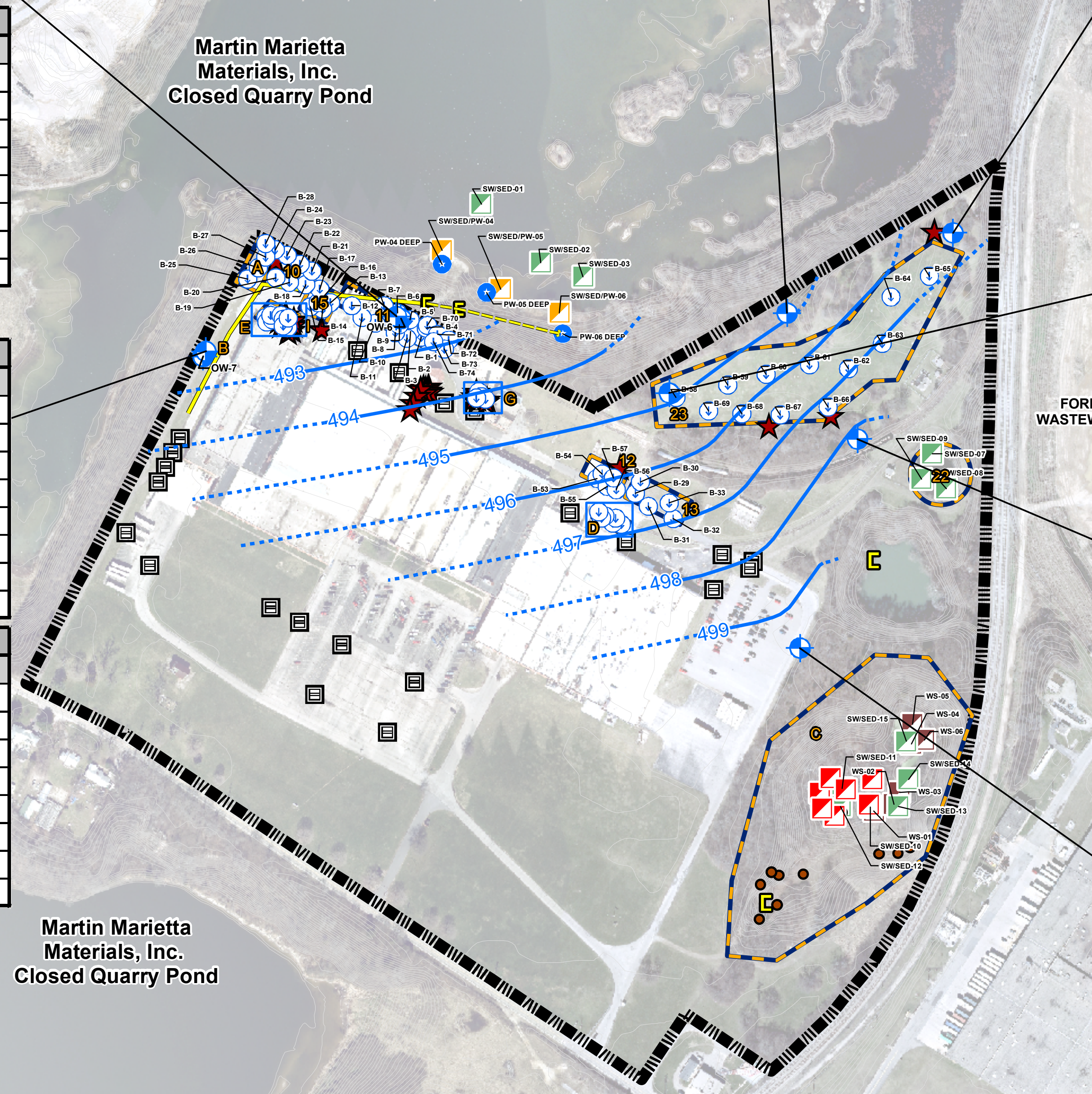
DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2 J	2.7	630	0.47 JB	64	0.29 JB	< 1 U	< 1 U
9/17/2014	D	1.5 JB	< 2 U	< 50 U	< 1 U	21	< 1 U	N/A	N/A
12/16/2014	T	2.3 J	61 B	1200 B	0.9 JBj	98	0.085 J	< 1 U	< 1 U
12/16/2014	D	1.6 JBj	1.1 JBj	< 50 U	< 1 U	10 B j	< 1 U	N/A	N/A
3/9/2015	T	<1.8 JBu	< 2.7 Bu	160	< 0.19 JBu	15	< 1 U	< 1 U	< 1 U
3/9/2015	D	1.6 J	<1.2 JBu	< 50 U	< 1 U	3.3 J	0.092 J	N/A	N/A
5/19/2015	T	3.9 JB	110 B	3800	2.3	320	0.09 J	< 1 U	< 1 U
5/19/2015	D	1.5 JB	1.5 JB	< 50 U	0.21 JB	31	0.13 JB	N/A	N/A

OW-7

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	0.63 J	2.1	290	0.19 JB	47	0.11 JB	< 1 U	< 1 U
9/17/2014	D	0.57 JB	< 2 U	< 50 U	< 1 U	37	< 1 U	N/A	N/A
12/16/2014	T	1 J	9.1 Bj	320 Bu	0.27 JBj	24	< 1 U	< 1 U	< 1 U
12/16/2014	D	0.85 JBj	2 Bj	< 50 U	< 1 U	11 Bj	< 1 U	N/A	N/A
3/9/2015	T	<2.2 JBu	33 B	2200	1.4 B	120	< 1 U	< 1 U	< 1 U
3/9/2015	D	0.88 J	< 3.2 Bu	< 50 U	< 1 U	6.2	< 1 U	N/A	N/A
5/19/2015	T	2.3 JB	41 B	2100	1.2	96	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.1 JB	1.4 JB	< 50 U	0.16 JB	6.5	< 1 U	N/A	N/A

OW-7D

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	4.8 J	13	6600	0.19 JB	53	0.077 JB	< 1 U	< 1 U
9/17/2014	D	1.9 JB	< 2 U	380	< 1 U	46	< 1 U	N/A	N/A
12/16/2014	T	6.4	50 B	7200 B	0.83 JBj	71	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.2 JBj	1.2 JBj	62 Bu	< 1 U	40 B	< 1 U	N/A	N/A
3/9/2015	T	7.7 B	26 B	7200	<0.33 JBu	57	< 1 U	< 1 U	< 1 U
3/9/2015	D	3.2 J	<1.3 JBu	270	< 1 U	46	< 1 U	N/A	N/A
5/19/2015	T	8.5 B	2.9 B	7200	0.63 J	71	< 1 U	< 1 U	< 1 U
5/19/2015	D	2.9 JB	1.6 JB	< 50 U	0.13 JB	44	< 1 U	N/A	N/A



OW-1

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	2.7 J	16	260	0.73 JB	9.2	0.99 JB	< 1 U	< 1 U
9/17/2014	D	2.1 JB	0.4 J	< 50 U	0.12 J	3.6 J	0.11 J	N/A	N/A
12/16/2014	T	2.4 J	1.5 JBj	180 Bu	0.29 JBj	8.1	< 1 U	< 1 U	< 1 U
12/16/2014	D	2.3 J	1.4 JBj	< 50 U	0.17 J	< 5 U	0.23 J	N/A	N/A
3/9/2015	T	2.6 JB	< 2.2 Bu	240	<0.44 JBu	10	0.19 J	< 1 U	< 1 U
3/9/2015	D	2.2 J	<1.4 JBu	< 50 U	0.16 J	< 5 U	0.21 J	N/A	N/A
5/19/2015	T	2.6 JB	9.4 B	170	0.28 J	10	0.091 J	< 1 U	< 1 U
5/19/2015	D	3.1 JB	1.6 JB	22 JB	0.34 JB	< 5 U	0.23 JB	N/A	N/A

OW-5

DATE	T/D	AS	CR	FE	PB	MN	TL	TCE	VC
9/17/2014	T	3.2 J	35	3000	1.8 B	270	0.26 JB	< 1 U	0.43 J
9/17/2014	D	1.3 JB	< 2 U	< 50 U	< 1 U	220	< 1 U	N/A	N/A
12/16/2014	T	1.5 J	2.5 B	550 B	0.33 JB	33	0.087 J	< 1 U	< 1 U
12/16/2014	D	0.94 JBj	1.1 JBj	< 50 U	< 1 U	15 Bj	< 1 U	N/A	N/A
3/9/2015	T	9.2 B	22 B	9900	4.9 B	370	0.2 J	< 1 U	< 1 U
3/9/2015	D	1 J	<1.2 JBu	< 50 U	< 1 U	20	< 1 U	N/A	N/A
5/19/2015	T	1.9 JB	3 B	940	0.6 J	23	< 1 U	< 1 U	< 1 U
5/19/2015	D	1.4 JB	1.4 JB	< 50 U	0.22 JB	1.2 J	0.14 JB	N/A	N/A

LEGEND

- Groundwater Observation Well
- Groundwater Contours (5/19/2015)
- Groundwater Contours (extrapolated)
- BWAY Property Boundary
- 2 FT Ground Surface Contours
- SWMU, AOC, or AOI investigated area

RFI Sampling Locations

- Geoprobe Soil Sample Location
- Pore Water Sample Location
- Collocated Surface Water and Sediment Sample Location
- Collocated Surface Water, Sediment, and Pore Water Sample Location
- Shallow Wetland Soil Sample Location

N

0 200 400 Feet

legal shown

Notes

All samples reported in UG/L (micrograms per liter); QA/QC Duplicate samples not shown on figure.

AS = Arsenic; CR = Chromium; FE = Iron; PB = Lead; MN = Manganese; TL = Thallium; TCE = Trichloroethene; VC = Vinyl Chloride; PCE = Tetrachlorethene

RSL: USEPA Regional Screening Levels, November 2015 (Iron RSL = 15,000) (Manganese RSL = 480)

MCL: Maximum Contaminant Level enforceable standard of National Primary Drinking Water Regulations under Safe Drinking Water Act

(Arsenic MCL = **10**) (Chromium MCL = **100**) (Lead MCL = **15**) (Thallium MCL = **2**) (TCE MCL = **5**) (Vinyl Chloride MCL = **2**)

T/D: measured basis (metals only); T = total, D = dissolved

N/A: Not Analyzed

U: Test America Lab Qualifier. Nondetect.

J: Test America Lab Qualifier. Method blank contamination. The associated method blank contains the target analyte at a reportable level.

B: Test America Lab Qualifier. Estimated result. Result is less than the reporting limit.

j: TRC Qualifier. The analyte was not detected above the reporting sample quantitation limit. However, the reported quantitation limit is approx. and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

u: TRC Qualifier. The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

TITLE

GROUNDWATER SAMPLE LOCATIONS & RESULTS SINCE SEPTEMBER 2014

PROJECT *BWAY RCRA CORRECTIVE ACTION (RCRA-05-2007-0011)*

DATE *Tuesday, March 22, 2016*

FIGURE *1*

PROJECT NUMBER *214114*

DRAWN BY *GIS*

TRC Results you can rely on
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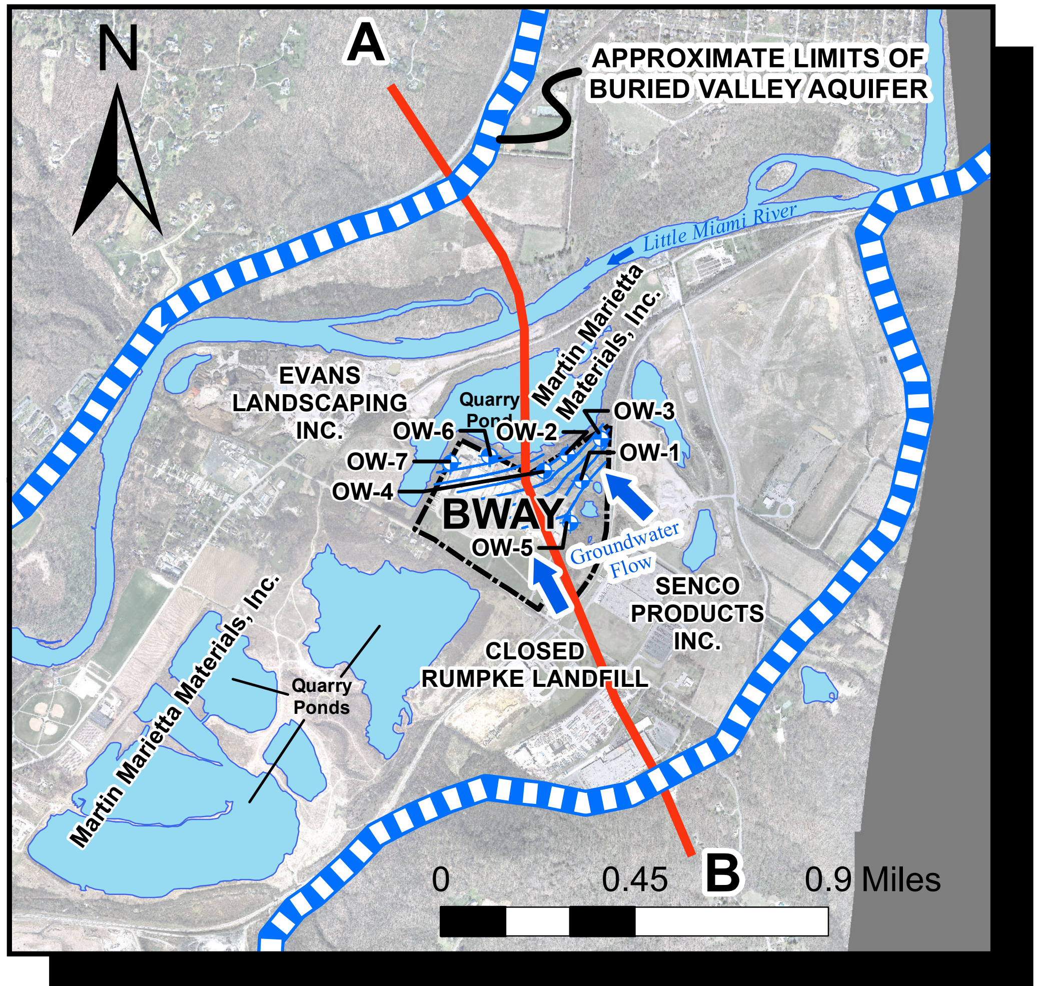
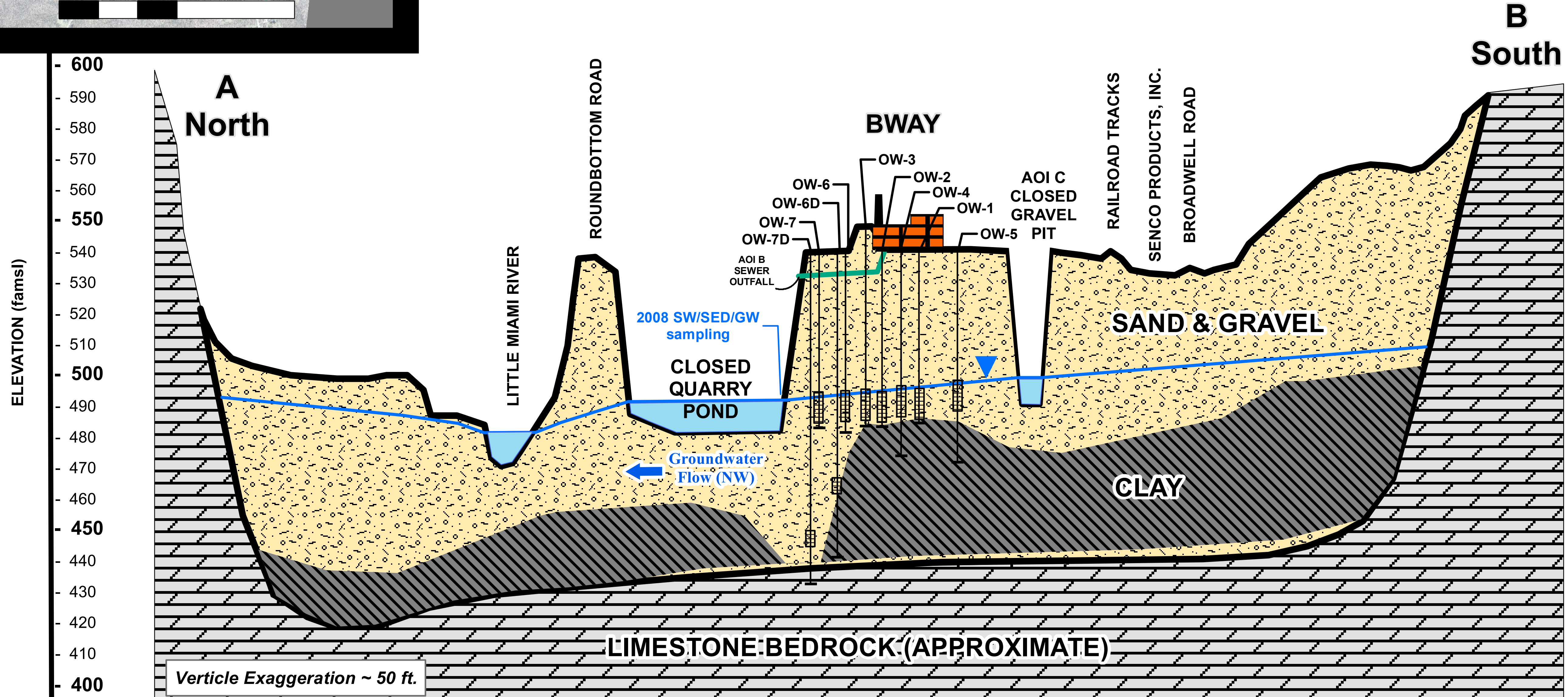


HYDROGEOLOGIC SUMMARY

- The site is underlain by the Little Miami River Buried Valley Aquifer and sits within the Little Miami River Watershed. The Little Miami River flows southwest of the site. Based on maps published by the Ohio EPA, the Facility is not located within a well field protection district.
- The Facility is located over a buried valley which is approximately 100 feet thick and 1 mile wide assigned to a portion of the U.S. EPA designated Greater Miami Sole Source Aquifer system.
- The unconsolidated deposits beneath the facility and in the vicinity of the Property generally consist of about 80 feet of sand and gravel deposits overlying about 30 feet of fine-grained, very-low permeability, glacial tills on top of bedrock.
- The underlying bedrock is composed of interbedded layers of shale and limestone belonging to the Kope Formation of Ordovician Age. The bedrock typically yields less than 5 gallons per minute to drilled wells and is not considered to be a significant aquifer.



modified from 1983 Burgess and Niple Hydrogeologic Investigation Report

G:\GIS_Projects\GIS_0654.13.00_Bway_CA\MXDs\CA750\Figure 4_Cross Section.mxd

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PROJECT NO. 214114.0000
FIGURE NO. 2
DRAWN BY JAG/PMR

PROJECT BWAY - RCRA Corrective Action

TITLE Geologic cross-section A to B (updated 2014)

REFERENCE Data Copyright © 2014, TRC. Additional public information data Copyright © 2006 Orthophoto Courtesy CAGIS (http://cagis.hamilton-co.org/). This map does not represent a legal document. It is intended to serve as an aid in graphical representation only.

Appendix B

Supplemental Groundwater Monitoring Results Tables

Table B-1a: Groundwater Screening Results Summary
Bway Corporation, Cincinnati, Ohio

On/Off-site	Area	Chem Group	Chemical	CASRN	Meas Basis	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Drinking Water Criteria (mg/L)		Ratio of Max Detect to Drinking Water Criteria
on	SWMU 23	VOC	Trichloroethene	79-01-6	T	HC	16	4	1.10E-02	2.90E-02	5.0E-03	SM	**5.8E+00**
on	SWMU 23	SVOC	Acetophenone	98-86-2	T	D	16	1	2.80E-04	2.80E-04	2.0E+00	NC	1.4E-04
on	SWMU 23	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	16	3	1.50E-03	3.40E-03	6.0E-03	SM	5.7E-01
on	SWMU 23	SVOC	Butylbenzylphthalate	85-68-7	T	C	16	2	2.00E-04	2.40E-04	4.1E-01	C	5.9E-04
on	SWMU 23	SVOC	Diethylphthalate	84-66-2	T	D	16	7	2.80E-04	8.80E-04	1.6E+01	NC	5.5E-05
on	SWMU 23	SVOC	Di-n-butylphthalate	84-74-2	T	D	16	1	4.10E-04	4.10E-04	2.0E+00	NC	2.1E-04
on	SWMU 23	SVOC	Di-n-octylphthalate	117-84-0	T		16	1	1.40E-03	1.40E-03	2.0E-01	NC	7.0E-03
on	SWMU 23	SVOC	Phenol	108-95-2	T	ID	16	4	4.90E-04	6.20E-04	6.0E+00	NC	1.0E-04
on	SWMU 23	INORG	Aluminum	7429-90-5	D	ID	16	2	9.10E-03	9.90E-03	2.0E+01	NC	5.0E-04
on	SWMU 23	INORG	Antimony	7440-36-0	D	ID	16	10	1.60E-04	5.50E-04	6.0E-03	SM	9.2E-02
on	SWMU 23	INORG	Arsenic	7440-38-2	D	A	16	16	5.00E-04	3.10E-03	1.0E-02	SM	3.1E-01
on	SWMU 23	INORG	Barium	7440-39-3	D	NC	16	16	4.20E-02	8.30E-02	2.0E+00	SM	4.2E-02
on	SWMU 23	INORG	Beryllium	7440-41-7	D	B1	16	13	6.00E-05	1.90E-03	4.0E-03	SM	4.8E-01
on	SWMU 23	INORG	Cadmium	7440-43-9	D	B1	16	10	6.30E-05	3.80E-04	5.0E-03	SM	7.6E-02
on	SWMU 23	INORG	Chromium (total)	7440-47-3	D		16	10	4.00E-04	1.70E-03	1.0E-01	SM	1.7E-02
on	SWMU 23	INORG	Cobalt	7440-48-4	D	LC	16	15	5.60E-05	9.30E-04	6.0E-03	NC	1.6E-01
on	SWMU 23	INORG	Copper	7440-50-8	D	D	16	7	9.00E-04	1.20E-03	1.3E+00	SM	9.2E-04
on	SWMU 23	INORG	Iron	7439-89-6	D	D	16	2	1.70E-02	2.20E-02	1.4E+01	NC	1.6E-03
on	SWMU 23	INORG	Lead	7439-92-1	D	B2	16	10	1.20E-04	4.20E-04	1.5E-02	SM	2.8E-02
on	SWMU 23	INORG	Manganese	7439-96-5	D	D	16	8	1.30E-03	5.50E-01	4.8E-01	NC	**1.1E+00**
on	SWMU 23	INORG	Nickel	7440-02-0	D	A	16	16	5.60E-04	4.40E-03	4.0E-01	NC	1.1E-02
on	SWMU 23	INORG	Selenium	7782-49-2	D	D	16	14	2.60E-04	1.70E-03	5.0E-02	SM	3.4E-02
on	SWMU 23	INORG	Silver	7440-22-4	D	D	16	2	2.00E-05	2.30E-05	1.0E-01	NC	2.3E-04
on	SWMU 23	INORG	Thallium	7440-28-0	D	ID	16	8	1.10E-04	3.50E-04	2.0E-03	SM	1.8E-01
on	SWMU 23	INORG	Vanadium	7440-62-2	D	ID	16	9	2.60E-04	2.50E-03	1.0E-01	NC	2.5E-02
on	SWMU 23	INORG	Zinc	7440-66-6	D	ID	16	1	7.40E-03	7.40E-03	6.0E+00	NC	1.2E-03
on	Unassigned	VOC	Tetrachloroethene	127-18-4	T	LC	24	4	1.20E-03	2.00E-03	5.0E-03	SM	4.0E-01
on	Unassigned	VOC	Trichloroethene	79-01-6	T	HC	24	1	1.50E-04	1.50E-04	5.0E-03	SM	3.0E-02
on	Unassigned	VOC	Vinyl Chloride	75-01-4	T	A	24	1	4.30E-04	4.30E-04	2.0E-03	SM	2.2E-01
on	Unassigned	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	T	B2	24	3	2.00E-03	5.50E-03	6.0E-03	SM	9.2E-01
on	Unassigned	SVOC	Butylbenzylphthalate	85-68-7	T	C	24	2	2.20E-04	4.70E-04	4.1E-01	C	1.1E-03
on	Unassigned	SVOC	Diethylphthalate	84-66-2	T	D	24	9	3.10E-04	8.10E-04	1.6E+01	NC	5.1E-05
on	Unassigned	SVOC	Di-n-butylphthalate	84-74-2	T	D	24	2	4.10E-04	4.20E-04	2.0E+00	NC	2.1E-04
on	Unassigned	SVOC	Naphthalene	91-20-3	T	C	24	1	1.50E-04	1.50E-04	4.0E-01	NC	3.8E-04
on	Unassigned	SVOC	Phenol	108-95-2	T	ID	24	6	3.50E-04	6.80E-04	6.0E+00	NC	1.1E-04
on	Unassigned	INORG	Aluminum	7429-90-5	D	ID	24	2	9.20E-03	2.40E-01	2.0E+01	NC	1.2E-02
on	Unassigned	INORG	Antimony	7440-36-0	D	ID	24	11	1.70E-04	4.70E-04	6.0E-03	SM	7.8E-02
on	Unassigned	INORG	Arsenic	7440-38-2	D	A	24	24	5.70E-04	7.20E-03	1.0E-02	SM	7.2E-01
on	Unassigned	INORG	Barium	7440-39-3	D	NC	24	24	2.00E-02	4.30E-01	2.0E+00	SM	2.2E-01
on	Unassigned	INORG	Beryllium	7440-41-7	D	B1	24	15	5.40E-05	9.40E-04	4.0E-03	SM	2.4E-01
on	Unassigned	INORG	Cadmium	7440-43-9	D	B1	24	8	7.50E-05	2.30E-04	5.0E-03	SM	4.6E-02
on	Unassigned	INORG	Chromium (total)	7440-47-3	D		24	13	1.10E-03	3.00E-02	1.0E-01	SM	3.0E-01
on	Unassigned	INORG	Cobalt	7440-48-4	D	LC	24	21	1.80E-04	9.30E-04	6.0E-03	NC	1.6E-01
on	Unassigned	INORG	Copper	7440-50-8	D	D	24	4	8.80E-04	1.40E-03	1.3E+00	SM	1.1E-03
on	Unassigned	INORG	Iron	7439-89-6	D	D	24	4	1.40E-01	2.20E+00	1.4E+01	NC	1.6E-01
on	Unassigned	INORG	Lead	7439-92-1	D	B2	24	7	1.30E-04	3.20E-04	1.5E-02	SM	2.1E-02
on	Unassigned	INORG	Manganese	7439-96-5	D	D	24	24	1.20E-03	2.50E-01	4.8E-01	NC	5.2E-01
on	Unassigned	INORG	Mercury	7439-97-6	D	D	24	1	9.20E-05	9.20E-05	2.0E-03	SM	4.6E-02
on	Unassigned	INORG	Nickel	7440-02-0	D	A	24	23	2.90E-04	1.50E-02	4.0E-01	NC	3.8E-02
on	Unassigned	INORG	Selenium	7782-49-2	D	D	24	15	2.90E-04	7.00E-04	5.0E-02	SM	1.4E-02
on	Unassigned	INORG	Thallium	7440-28-0	D	ID	24	3	9.20E-05	1.40E-04	2.0E-03	SM	7.0E-02
on	Unassigned	INORG	Vanadium	7440-62-2	D	ID	24	11	2.90E-04	2.50E-03	1.0E-01	NC	2.5E-02
on	Unassigned	INORG	Zinc	7440-66-6	D	ID	24	1	9.80E-03	9.80E-03	6.0E+00	NC	1.6E-03

Notes:

Only constituents detected in each area are shown.

The drinking water criteria are based on the following hierarchy: State Maximum Contaminant Level (MCL), Federal MCL, USEPA Regional Screening Level (RSL) Tap Water Ingestion value (November 2015) at the lower of the criteria calculated at either the target cancer risk of 1E-5 or target hazard quotient of 1.

The criteria for Chromium (total) are the criteria provided by the agency for Chromium VI.

Ratios of concentration to the criteria greater than 1 are shaded in bold.

SM - The criterion is the State MCL.

C - The criterion is based on cancer risk at a target cancer risk of 1E-5.

NC - The criterion is based on noncancer effects at a hazard quotient of 1.

Chem Group - chemical group

Meas Basis - measured basis; T = total, D = dissolved

Carc Class - USEPA Weight-of-Evidence Cancer Classification

Table B-1b: Groundwater Samples Exceeding Screening Criteria
Bway Corporation, Cincinnati, Ohio

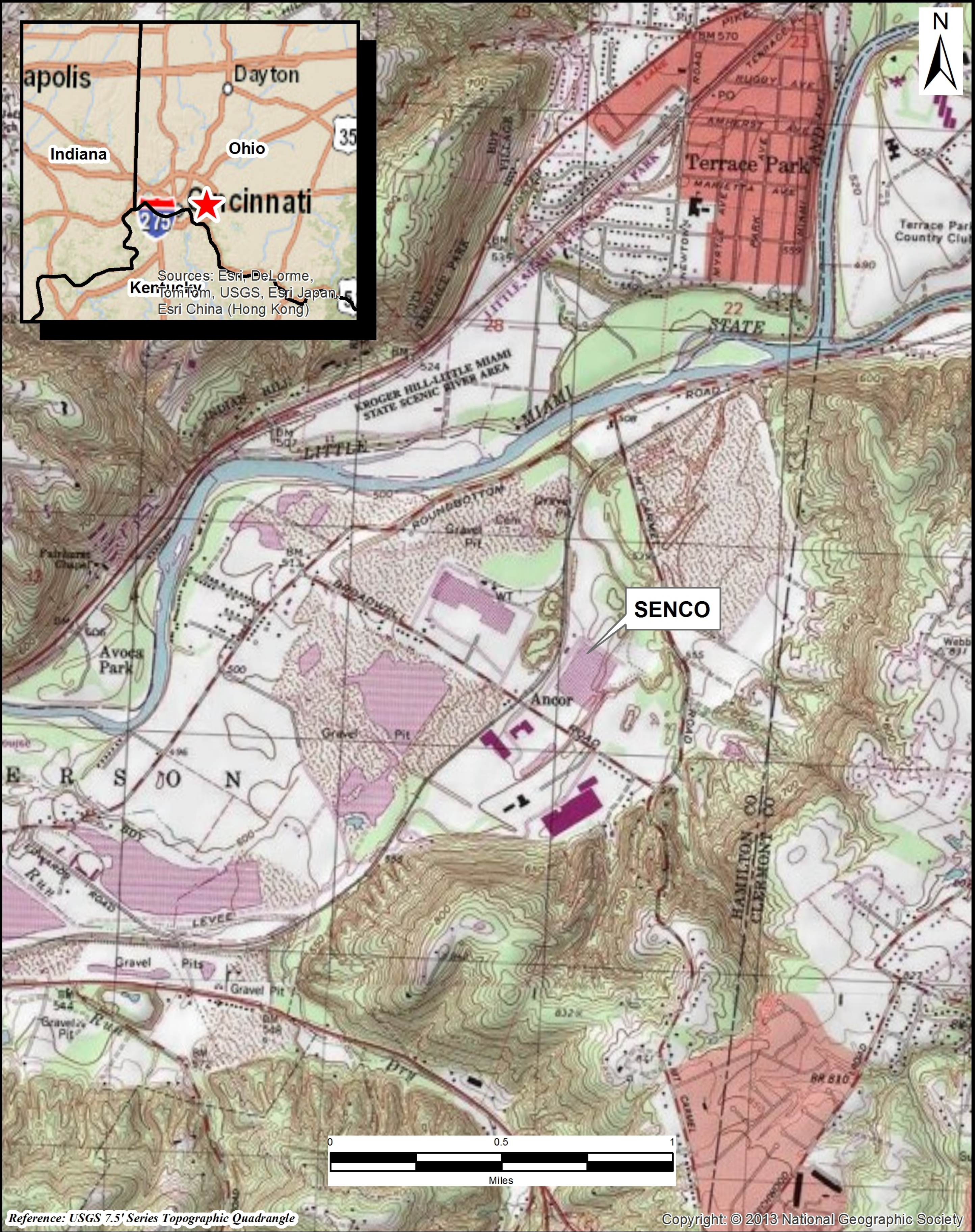
On/Off Site	Area	Location	Sample ID	Sample Type	Sample Date	Chem Group	Chemical	CASRN	Meas Basis	Conc (mg/L)	Qual	Drinking Water Criteria (mg/L)	Ratio of Conc to Drinking Water Criteria
on	SWMU 23	OW-3	OW-3/091714	N	09/17/14	VOC	Trichloroethene	79-01-6	T	2.90E-02		5.0E-03	**5.8E+00**
on	SWMU 23	OW-3	OW-3/121614	N	12/16/14	VOC	Trichloroethene	79-01-6	T	1.10E-02		5.0E-03	**2.2E+00**
on	SWMU 23	OW-3	OW-3/121614	N	12/16/14	INORG	Manganese	7439-96-5	D	5.10E-01	B	4.8E-01	**1.1E+00**
on	SWMU 23	OW-3	OW-3/030915	N	03/09/15	VOC	Trichloroethene	79-01-6	T	1.10E-02		5.0E-03	**2.2E+00**
on	SWMU 23	OW-3	OW-3/030915	N	03/09/15	INORG	Manganese	7439-96-5	D	5.50E-01		4.8E-01	**1.1E+00**
on	SWMU 23	OW-3	OW-3/051915	N	05/19/15	VOC	Trichloroethene	79-01-6	T	2.00E-02		5.0E-03	**4.0E+00**

Notes:

B = Estimated result. The result is less than the reporting limit.

Appendix C

Supplemental File Review Documentation


N
SENCO
Indiana
Ohio
Kentucky
Dayton
Cincinnati
Sources: Esri, DeLorme, TomTom, USGS, Esri Japan, Esri China (Hong Kong)
Terrace Park
Terrace Park Country Club
LITTLE MIAMI
KROGER HILL-LITTLE MIAMI STATE SCENIC RIVER AREA
ROUNDBOTTOM
BROADWELL
ROAD
Ancor
Avoca Park
Gravel Pit
Gravel Pits
HAMILTON CO
CLERMONT CO
LEVEE
0
0.5
1
Miles
Reference: USGS 7.5' Series Topographic Quadrangle
Copyright: © 2013 National Geographic Society

SENCO EPA Waste Codes (SOURCE: OEPA file review and EDR Database Report)

D001 Ignitable waste
D002 Corrosive waste
D003 Reactive waste
D010 Selenium

F001 The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichlorethylene, methylene chloride, 1,1,1- trichloroethane, carbon tetrachloride and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F002 The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2- trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2, trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F001, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F003 The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent nonhalogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above nonhalogenated solvents, and a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F005 The following spent nonhalogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2- nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above nonhalogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

U002 2-Propanone (I)

U159 2-Butanone (I,T)

U181 Benzenamine, 2-methyl-5-nitro

U210 Ethene, tetrachloro-, Tetrachloroethylene

U220 Benzene, methyl-

U226 Ethane, 1,1,1-trichloro-

U239 Xylene (I)

OhioEPA

Re: Senco Products, Inc.
Anderson Township
Greene County
Ground Water

Mr. Michael M. Powell, P.E.
KZF, Incorporated
2830 Victory Parkway
Cincinnati, Ohio 45206

May 22, 1978

Dear Mr. Powell:

Reference our telephone conversation on May 19, 1978. During that conversation we discussed the possibility of discharge of Senco's wastewater to a stream on the Senco property. The proposed receiving stream is a source of ground water recharge (the stream disappears into a nearby gravel pit). The wastewater in the receiving stream would contaminate the ground water. Ground water rejuvenation is a very slow and complex process that is not well understood. For this reason, ground water quality standards have not been developed. Without such standards as guidelines a ground water discharge permit system is not practical. Most industrial wastewaters would require treatment sufficient to bring the quality of the wastewater up to drinking water standards before we could be sure that the ground water quality was protected.

You also asked whether Ohio Revised Code § 6111.99 (Penalties) would apply in the case of Senco's wastewater discharge. General provisions of section § 6111.04 would probably be most applicable. Ordinarily, every effort is made to find an acceptable disposal practice without resorting to fines or other penalties.

Your letter dated May 17, 1978, indicated that the existing lagoons had been dammed. Assuming there is no surface leakage from the lagoons, and the liquid waste is delivered to the lagoons at the rate of about 3000 gallons per day, there must be infiltration into the ground. This method of waste disposal is a threat to ground water quality and is not acceptable.

If you have any questions or require further assistance, please feel free to call me.

Very truly yours,

James D. Pennino

James D. Pennino
District Geologist
Public Water Supply Section

JDP:sjs

Penn

Ohio EPA

Re: Hamilton County
Anderson Township
Senco Products, Inc.
Industrial Wastewater

Mr. George Juilfs, President
Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

June 24, 1977

Dear Mr. Juilfs:

On February 24, 1977, Mr. John Noyes, Ohio EPA, Geologist, and I met with Mr. Roy Staub, Plant Engineer, and Mr. Pete Eberle, Risk Manager of Senco, and Mr. Tony Di Puccio of KZF Consultants. The purpose of this meeting was to familiarize Mr. Noyes and me with your industrial and sanitary wastewater disposal procedures. The following findings, conclusions and recommendations are submitted for your consideration and action:

Findings

1. Your industrial wastewater consists of spent phosphoric acid, caustic floor cleaner and water soluble coolants. The volume is roughly 6000 gallons per day, of which about 90% is spent phosphoric acid. This wastewater is discharged to a tank truck which delivers the waste to lagoons located on Senco property. During our visit, Mr. Eberle and Mr. Staub informed us that there is an unexplained excess of wastewater that is discharged to the tank truck. On March 2, 1977, I sent Mr. Eberly a letter requesting clarification of this problem. He later informed me that an investigation of the problem is being conducted. We need to know the source and composition of any wastewater. Please send me a copy of the completed investigation concerning the excess wastewater problem mentioned above.

2. The discharge of sanitary wastewater from Plant 1 is about 20,000 gallons per day. The discharge from Plant 2 is unknown. The wastewater from both plants eventually drains to gravel pits.

3. On March 14, 1977, John Noyes and I again visited the area of the lagoons to determine if there was any ground water seepage to the surface of the hillside below the lagoons. We could find no evidence of ground water seepage on the hillside. However, we did notice a small flow from the side of one of the lagoons into a ditch which drained over the hillside. This flow continues until it eventually reaches one of the gravel pits. Analysis of this discharge at a point near the bottom of the hill indicated high levels of metals.

State of Ohio Environmental Protection Agency
Southwest District Office
7 East Fourth Street, Dayton, Ohio 45402 · (513) 461-4670

James A. Rhodes, Governor
Ned E. Williams, P.E., Director

Ohio EPA

Re: Hamilton County
Anderson Township
Industrial Wastewater Disposal

Mr. Peter A. Eberle
Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

March 2, 1977

Dear Mr. Eberle:

Thank you for meeting with Mr. John Noyes and me at your Senco Products, Inc. plant on February 24, 1977. This visit enabled us to become familiar with your wastewater generating process and wastewater disposal methods. However, there are some aspects of wastewater disposal which need further clarification. The items in question are listed below:

1. What is the total quantity of process wastewater discharged to the lagoons per day?

   a. How much of this is (1) nail cleaning solution, (2) floor cleaning solution, (3) oil coolant, (4) other?

   b. List the major significant chemical constituents (i.e., phosphoric acid, wetting agent, etc.) in each of the items described in the above.

2. There appears to be an excess accumulation of process wastewater going to the disposal tank truck. If possible, please explain where this excess water is coming from and estimate how much of the total wastewater discharge can be attributed to this problem.

3. What is the total quantity of sanitary wastewater discharged from Plant 1 and Plant 2?

This information will help me in my assessment of potential ground water contamination. I appreciate your help in this effort. If you have any questions please do not hesitate to call me.

Very truly yours,

James D. Pennino

James D. Pennino, District Geologist
Public Water Supply Section

JDP/mlk

cc: Elmer Rehme, Industrial Wastewater Group

OhioEPA

Re: Senco Products, Inc.
Anderson Township
Greene County
Ground Water

Mr. Michael M. Powell, P.E.
KZF, Incorporated
2830 Victory Parkway
Cincinnati, Ohio 45206

May 22, 1978

Dear Mr. Powell:

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You also asked whether Ohio Revised Code § 6111.99 (Penalties) would apply in the case of Senco's wastewater discharge. General provisions of section § 6111.04 would probably be most applicable. Ordinarily, every effort is made to find an acceptable disposal practice without resorting to fines or other penalties.

Your letter dated May 17, 1978, indicated that the existing lagoons had been dammed. Assuming there is no surface leakage from the lagoons, and the liquid waste is delivered to the lagoons at the rate of about 3000 gallons per day, there must be infiltration into the ground. This method of waste disposal is a threat to ground water quality and is not acceptable.

If you have any questions or require further assistance, please feel free to call me.

Very truly yours,

James D. Pennino

James D. Pennino
District Geologist
Public Water Supply Section

JDP:sjs

Ohio EPA

Re: Senco Products, Inc.
Anderson Township
Greene County
Ground Water

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2830 Victory Parkway
Cincinnati, Ohio 45206

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If you have any questions or require further assistance, please feel free to call me.

Very truly yours,

James D. Pennino

James D. Pennino
District Geologist
Public Water Supply Section

JDP:sjs

State of Ohio Environmental Protection Agency
Southwest District Office
7 East Fourth Street, Dayton, Ohio 45402 • (513) 461-4670

James A. Rhodes, Governor
Ned E. Williams, P.E., Director

Jim See me on this

senco fastening systems

July 19, 1977

RECEIVED
JUL 25 1977
Ohio Environmental Protection Agency
SOUTHWEST DISTRICT

Mr. James D. Pennino
Public Water Supply Section
STATE OF OHIO ENVIRONMENTAL
PROTECTION AGENCY
Southwest District Office
7 East Fourth Street
Dayton, Ohio 45402

Dear Mr. Pennino:

In your letter of June 24, 1977, to Mr. George Juilfs, President, you stated your findings, conclusions, and recommendations pertaining to our liquid waste disposal; primarily, the use of lagoons.

In the recommendation portion of your letter, you stated that, "the occasional surface discharge from the present lagoons should be dammed". Based upon this recommendation, we have taken the necessary actions to dam the lagoons; thus, prevent surface discharge. The work to correct this situation will be completed by August 15, 1977, assuming weather permits access. Should we foresee any event that would delay our completion date, you will be advised by letter accordingly.

Your second recommendation states that, "the use of the lagoons as a method of wastewater disposal is not acceptable due to potential ground water contamination". Thus, you advised that Senco Products, Inc., must establish an environmentally acceptable alternative to lagoon disposal, and submit a preliminary plan for elimination of this disposal method by August 12, 1977.

In regard to accomplishing this recommendation, we are prepared to comply. However, I am sure you can appreciate that to develop alternatives, requires considerable investigation plus the potential of sizable investment upon implementation of the final alternative selected.

These two factors, compounded by our difficulties with previous O.E.P.A. representatives in acquiring specific information requested, possibly contributed to by our lack of understanding of your organizational procedures - regulations, leaves us with major concerns. Of utmost importance is, that we, after exerting the resources required, are assured that the results will be accomplished and comply with O.E.P.A. regulations.

In order to eliminate our concerns and attain the desired results, we must develop a working relationship, and have a commitment that information and support will be provided by the O.E.P.A. to assist in our decision-making process.

If you concur with the above, I would suggest that the following be pursued toward compliance with your recommendations concerning formulation of a preliminary plan.

First, we have retained KZF and F.E. Gates & Associates as Environmental Consultants and Laboratory Analysis-Treatment Specialists to determine;

1) Specific liquid waste volumes discharged into existing lagoons.

2) Chemical analysis of specific chemical composition and percentage in liquid discharge.

It is estimated that this study will be completed within eight weeks, or by September 15, 1977. The information derived from items one and two will be used to develop specific alternatives that can be independently evaluated. It is our best estimate that the evaluation of the individual alternatives will require 16 weeks to accomplish.

Upon defining the various alternatives, prior to evaluating each, we are anticipating that many specific questions relating to;

A) Environmental acceptability.

B) O.E.P.A. conformance standards - regulations.

C) Operating procedures, sampling, permits, reports, etc.

D) Structural specifications, etc.

must be answered for each alternative proposed.

good idea

Therefore, I am recommending that the two steps of our approach in this letter be accepted as our interim plan. Secondly, I am requesting that a meeting be scheduled at your office between September 15 and October 1, 1977, to discuss the questions outlined. Upon concluding this meeting, we will have the required information to outline the next steps of our plan and respective target dates.

Mr. James D. Pennino
STATE OF OHIO ENVIRONMENTAL PROTECTION AGENCY

July 19, 1977
Page #3

In closing, upon your review of our recommended approach outlined, and written confirmation as to its acceptance, it would be appreciated if you could provide tentative dates for our suggested meeting. Upon receipt, I will confirm the date which is most suitable.

Respectfully,

SENCO PRODUCTS, INC.

N. D. Day
General Manager
Operation #1

cc: E. Rehme, Chief Industrial Wastewater Group, O.E.P.A.
R. Stein, Ground Water Division, O.E.P.A.
C. Becht, Vice-President, Engineering, SENCO
G. Juilfs, President, SENCO
J. Racer, Vice-President, Manufacturing, SENCO
R. Staub, Manager, Plant Engineering, SENCO
P. Eberle, Manager, Risk Management, SENCO

NDD/pf

senco fastening systems

November 2, 1977

RECEIVED
NOV 4 - 1977
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

Mr. James D. Pennino
Public Water Supply Section
State of Ohio
Environmental Protection Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

Dear Mr. Pennino:

In my letter to you of October 3, 1977, I indicated that we hoped to complete sampling and analysis by November 1. Unfortunately, the remaining unsampled piece of equipment, our #3 Nail Cleaning Machine, is malfunctioning and we have not been able to obtain samples. We hope to have this corrected in the near future.

When we have completed our sampling and analysis, we will send the results to your office.

Sincerely,

P. A. Eberle

Peter A. Eberle
Corporate Risk Manager

PAE:jkw

cc: N. Day - Senco
R. Staub - Senco
T. Haskell - Senco
M. Powell - KZF
E. Rehme - OEPA

senco
fastening
systems

October 3, 1977

RECEIVED
OCT 11 1977
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

James D. Pennino
Public Water Supply Section
State of Ohio
Environmental Protection Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

Dear Mr. Pennino:

At our meeting on September 3, 1977 at Senco, we agreed that on October 1 we would report the progress to date regarding our liquid waste disposal.

In his letter of July 19 to your office, Mr. Norm Day, General Manager for Operation #1, stated that Senco was pursuing the following actions prior to establishing a final compliance plan:

1) We have retained F. E. Gates & Associates to perform the chemical analysis to determine specific chemical composition and percentages in the liquid waste.

2) We are determining specific liquid waste volumes discharged into the existing lagoons.

3) We have retained KZF to analyze the problem and evaluate possible alternative solutions for disposal of the liquid waste.

Mr. Day, in his letter, stated that we had planned to complete steps 1 and 2 by September 15. Unfortunately, our schedule has slipped somewhat in that the analysis of all the liquid wastes have not been completed. Attached to this memo is the analytical results of samples taken from our #3 Nail Cleaner and our tank truck. Analysis from samples taken from the Ransohoff Cleaning Machine and #3 Nail Cleaning Boiler will be taken during October. We hope to have all sampling completed with analysis by November 1.

We have completed the analysis of liquid waste volumes discharged into the lagoons. Attached to this memo is a log of the quantities for the period July 1 through August 31. We feel that the quantities stated on this log are representative of our normal production waste volumes.

Following completion of items 1 and 2 above, KZF has been retained to develop alternative methods of disposal of the liquid and to study each alternative as to its environmental acceptability, EPA standards conformance, necessary operating procedures, sample requirements, permits, reports, and structural specifications. Our initial time estimate is that it will require 16 weeks to accomplish this.

As soon as we receive the final analytical tests from F. E. Gates and Associates, I will forward them to your office. We would appreciate your comments concerning our outline of priorities, activities and time table as presented in Mr. Day's July 19 letter and in this letter. If you have any additional questions please don't hesitate to contact me.

Sincerely,

P.A. Eberle

Peter A. Eberle
Corporate Risk Manager

PAE:jkw

cc: E. Rehme, Chief
Industrial Waste Water Group
OEPA

N. Day, General Manager-Operation #1

R. Staub, Manager-Plant Engineering

March 17, 1975

Southwest District Office
7 East Fourth Street
Dayton, Ohio 45402

Re: Hamilton County
Anderson Township
Senco Products, Inc.
Plants 1 and 2
Sewerage

James A. Rhodes
[redacted]
Governor
[redacted]
Director
Ned E. Williams

Mr. Roy R. Staub, Plant Engineer
Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

Dear Mr. Staub:

On March 13, 1975, Mr. Richard Carlton of this office inspected the sewage treatment plants serving Senco Products -- Plants #1 and #2. Mr. Carlton was accompanied by Mr. Ray Kappesser, maintenance foreman, at plant #1; and by Mr. Dale Banfill, maintenance foreman, at plant #2.

The primary purpose of these inspections was in regard to processing your Applications for NPDES Permits. Mr. Carlton determined that neither plant's discharge reached the Little Miami River and therefore that NPDES Permits are not required for either plant.

For the present we will complete processing of the permit applications on the basis that the plants are exempt and at some future date (this year) will issue orders, in the Director's name, requiring satisfactory operation and maintenance of the facilities together with submission of monthly reports of operation.

With regards to the present level of operation and maintenance of the plants, we are pleased to report that it appeared to be quite good in both cases. The discharge from plant #2 was the better of the two inasmuch as that plant is equipped with effluent filtration equipment. A review of past monthly operating reports reveals that no reports were submitted for August, September, October, and November, 1974. It also appears that no reports for plant #2 were submitted until January, 1975, even though the plant was installed in late 1973 and indicated to be placed into operation during early 1974.

The past performance of plant #1 seems to have been quite erratic from an effluent quality standpoint. Consideration should be given to the following as an effort to improve its performance:

1. The effect of the deburring process wastewater slurry,

2. The effect of food wastes from the cafeteria,

3. The average daily flow,

4. The effective hydraulic load on the plant due to the raw wastewater pumps.

It is quite possible that the deburring wastewater slurry is overloading the plant with suspended solids. It may be that these can be handled by the plant if excess sludge (solids) holding facilities are installed and a more rigorous program of in-plant solids control is maintained; or it may be that separate treatment facilities for the deburring slurry may be needed.

We suggest that you study this problem and report back to us within the next 6 months as to your findings. If you have any questions or comments, please feel free to contact this office.

Very truly yours,

Charles W. Forsthoff, P.E.
Assistant Chief
Division of Waste Management
and Engineering

CWF:sjw:RJC

cc: H. D. Jacobs, Jr., D.V.M.
Health Commissioner
cc: James Greener, OEPA

senco fastening systems

July 5, 1977

Mr. James D. Pennino
State of Ohio
Environmental Protection
Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

Dear Mr. Pennino:

As we discussed on the telephone recently, I am preparing the materials for you which you requested in your March 2nd letter. As I still do not have the information concerning the reason for water gallonage from the KZF consulting firm, I will forward the information I have to you by the end of this month.

Regards,

Peter A. Eberle | jkw

Peter A. Eberle
Corporate Risk Manager

PAE:jkw

senco products inc. • 8485 broadwell rd • cincinnati • ohio 45244 • (513) 474-3000

9/6/77 Lance Products

R. Strauch
D. Ory
R. Eberle

wait for results + recom. from K2F on industrial process.

Will make another meeting in October

fastening systems

R ~~Pennino~~
~~Elmer~~
File

November 2, 1977

RECEIVED
NOV - 7 1977
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

Mr. James D. Pennino
Public Water Supply Section
State of Ohio
Environmental Protection Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

Dear Mr. Pennino:

In my letter to you of October 3, 1977, I indicated that we hoped to complete sampling and analysis by November 1. Unfortunately, the remaining unsampled piece of equipment, our #3 Nail Cleaning Machine, is malfunctioning and we have not been able to obtain samples. We hope to have this corrected in the near future.

When we have completed our sampling and analysis, we will send the results to your office.

Sincerely,

P. A. Eberle

Peter A. Eberle
Corporate Risk Manager

PAE:jkw

cc: N. Day - Senco
R. Staub - Senco
T. Haskell - Senco
M. Powell - KZF
E. Rehme - OEPA

Penn

Ohio EPA

Re: Hamilton County
Anderson Township
Senco Products, Inc.
Industrial Wastewater

Mr. George Juilfs, President
Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

June 24, 1977

Dear Mr. Juilfs:

On February 24, 1977, Mr. John Noyes, Ohio EPA, Geologist, and I met with Mr. Roy Staub, Plant Engineer, and Mr. Pete Eberle, Risk Manager of Senco, and Mr. Tony Di Puccio of KZF Consultants. The purpose of this meeting was to familiarize Mr. Noyes and me with your industrial and sanitary wastewater disposal procedures. The following findings, conclusions and recommendations are submitted for your consideration and action:

Findings

1. Your industrial wastewater consists of spent phosphoric acid, caustic floor cleaner and water soluble coolants. The volume is roughly 6000 gallons per day, of which about 90% is spent phosphoric acid. This wastewater is discharged to a tank truck which delivers the waste to lagoons located on Senco property. During our visit, Mr. Eberle and Mr. Staub informed us that there is an unexplained excess of wastewater that is discharged to the tank truck. On March 2, 1977, I sent Mr. Eberly a letter requesting clarification of this problem. He later informed me that an investigation of the problem is being conducted. We need to know the source and composition of any wastewater. Please send me a copy of the completed investigation concerning the excess wastewater problem mentioned above.

2. The discharge of sanitary wastewater from Plant 1 is about 20,000 gallons per day. The discharge from Plant 2 is unknown. The wastewater from both plants eventually drains to gravel pits.

3. On March 14, 1977, John Noyes and I again visited the area of the lagoons to determine if there was any ground water seepage to the surface of the hillside below the lagoons. We could find no evidence of ground water seepage on the hillside. However, we did notice a small flow from the side of one of the lagoons into a ditch which drained over the hillside. This flow continues until it eventually reaches one of the gravel pits. Analysis of this discharge at a point near the bottom of the hill indicated high levels of metals.

Mr. George Juilfs
June 24, 1977
Page 2

4. Field observations and available geological information indicate that the lagoons are located over permeable soils. These soils will allow the wastewater to percolate downward into the ground water. Analysis of the wastewater delivered to the lagoons indicate high levels of metals, salts and oils. Some of these materials could result in substantial degradation of the ground water. Ground water development potential along this section of the Great Miami River is excellent and these disposal lagoons pose a hazard to the ground water quality. Previous correspondence mentions a ground water survey to have been conducted by KZF and Associates for Senco. A copy of such a survey is not in our files. Should this survey be completed, we would like to have a copy for our records.

Conclusions

1. Apparently there is an occasional surface flow from the lagoons. This flow eventually reaches the Dravo Co. gravel pit where it can easily percolate down to the ground water. The amount of flow into the ditch plus any evaporation from the lagoon surface cannot account for the influx of approximately 6000 gallons per day to the lagoons. Therefore it must be concluded that a significant quantity of wastewater is migrating downward to the ground water table.

2. The sanitary wastewater which enters the gravel pits represents some hazard to the ground water because of the high permeability of the gravel deposits. If the sanitary wastewater treatment systems are properly operated and maintained, the only chemical constituents of major concern would then be nitrate. The presence of nitrates in the ground water represents less danger to the ground water than the chemicals in the lagoons. However, some consideration should be given to the possibility of discharging the sanitary wastewater directly to the Miami River or a tributary.

Recommendations

1. The occasional surface discharge from the lagoons should be dammed.

2. Under Section 6111.04 of the Ohio Revised Code, the OEPA has the authority to control wastes which enter the waters of the State. The use of the lagoons as a method of wastewater disposal is not acceptable because of the potential for ground water contamination. Therefore, it will be necessary for Senco to establish an environmentally acceptable alternative to lagoon disposal. Submit a letter to me by August 12, 1977 describing your preliminary plans for elimination of this method of disposal.

Should you have any questions or require assistance, please feel free to call this office.

Very truly yours,

James D. Pennino

James D. Pennino, Public Water Supply Section
cc: Elmer Rehme, Chief Industrial Wastewater Group cc: Russ Stein, Ground Water Div.

Ohio EPA

Re: Hamilton County
Anderson Township
Industrial Wastewater Disposal

March 2, 1977

Mr. Peter A. Eberle
Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

Dear Mr. Eberle:

Thank you for meeting with Mr. John Noyes and me at your Senco Products, Inc. plant on February 24, 1977. This visit enabled us to become familiar with your wastewater generating process and wastewater disposal methods. However, there are some aspects of wastewater disposal which need further clarification. The items in question are listed below:

1. What is the total quantity of process wastewater discharged to the lagoons per day?

    a. How much of this is (1) nail cleaning solution, (2) floor cleaning solution, (3) oil coolant, (4) other?

    b. List the major significant chemical constituents (i.e., phosphoric acid, wetting agent, etc.) in each of the items described in the above.

2. There appears to be an excess accumulation of process wastewater going to the disposal tank truck. If possible, please explain where this excess water is coming from and estimate how much of the total wastewater discharge can be attributed to this problem.

3. What is the total quantity of sanitary wastewater discharged from Plant 1 and Plant 2?

This information will help me in my assessment of potential ground water contamination. I appreciate your help in this effort. If you have any questions please do not hesitate to call me.

Very truly yours,

James D. Pennino

James D. Pennino, District Geologist
Public Water Supply Section

JDP/mlk

cc: Elmer Rehme, Industrial Wastewater Group

State of Ohio Environmental Protection Agency
Southwest District Office
7 East Fourth Street, Dayton, Ohio 45402 • (513) 461-4670

James A. Rhodes, Governor
Ned E. Williams, P.E., Director

OHIO ENVIRONMENTAL PROTECTION AGENCY

FILE MEMORANDUM

WITH Letter to Mrs. Denneman - Round Bottom Rd. DATE 5-5-77

REPRESENTING ______ TIME ______

PERMIT NO. ______ PHONE NO. ______

OEPA STAFF Jim Pennino

SUBJECT Level of Nitrogen Ammonia in Well Water Hamilton Co.

Anderson Twp

NOTES & SUMMARY: FOLLOW-UP DATE ______

Sent letter to Mrs. Denneman indicating that the level of nitrogen ammonia in her well might indicate some sort of surface contamination of the well. I also told her it would be a good idea to have the well tested for bacteria by the local health department.

Signature James Pennino

OEPA-INDWW-3

INTER-OFFICE COMMUNICATION

TO: Don Day, Land Pollution Control DATE: January 15, 1976

FROM: Jeff Hosler, Public Water Supply Section - SWDO

SUBJECT: Senco Products, Inc.

After receiving the information in the accompanying IOC from Elmer Rehme, I investigated reference facility on 1/13/76 in company of Mr. Pete Eberle, Risk Manager of the entity. Mr. Eberle informed me that among his other duties, he is responsible for all matters relating to environmental control and regulations.

The geologic conditions at the lagoon sites are not accurately known. Observation showed that the lagoon sidewalls were composed of a soil with significant amounts of clay and coarse gravel. The fact that the disposal rate is about 6000 gallons per day and that, to the best of Mr. Eberle's knowledge, the lagoons have never overflowed, indicates that a significant amount of the waste is infiltrating into the ground through the lagoon bottoms.

I was not able to find any spring or seepage zones in the hill slope below the lagoons; however, this slope is completely covered by solid waste generated at the Senco plant. Most of this material appears to be cardboard, pallets, drums, etc. but constitutes a rather unsightly dump nevertheless.

I asked Mr. Eberle to obtain several samples of the waste in the lagoons and have them analyzed for the appropriate parameters. After this information is submitted, I feel OEPA should decide on some course of action, even if it only involves ground water monitoring in the vicinity of the site.

As you are aware from my evaluation of this area in reference to the proposed Anderson Township landfill, ground water supply development potential is excellent in this section of the valley and all area waste disposal operations represent some hazard to ground water quality.

Please let me know if there is any further information I can supply at this time.

pac

Issue Date: July 12, 1985
Effective Date: July 12, 1985

BEFORE THE
OHIO ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:

Senco Products, Inc.	:	Director's Final Findings
8485 Broadwell Road	:	and Orders
Cincinnati, Ohio 45244	:	

Pursuant to Section 6111.03(H) of the Ohio Revised Code, the Director of the Ohio Environmental Protection Agency (Ohio EPA) hereby makes the following Findings and issues the following Orders:

FINDINGS

1. Senco Products, Inc., hereinafter referred to as "this entity", operates a pneumatic fastening tool assembly plant located at 8485 Broadwell Road, Cincinnati, Ohio hereinafter referred to as "Plant #1".

2. This entity also operates a staple and nail production plant located at 8450 Broadwell Road, Cincinnati, Ohio, hereinafter referred to as "Plant #2".

3. In the course of operations at Plant #1 non-contact cooling water and sanitary wastewater are generated, inadequately treated and discharged to an unnamed ditch tributary to an unnamed pond located behind the landfill to the east of the facility, thence to groundwater which are waters of the State of Ohio.

4. In the course of operations at Plant #2 process and sanitary wastewater and non-contact cooling water is generated, inadequately treated and discharged to two separate unnamed ditches to an unnamed pond located behind the plant, thence to groundwater which are waters of the State of Ohio.

5. This entity is currently discharging pollutants to waters of the State at Plants #1 and #2 without an NPDES permit. This is in violation of Section 6111.04 of the Ohio Revised Code.

6. Applications for NPDES permits for both facilities were originally made on November 18, 1974 and were again made on August 9, 1984, short Form C.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Vivian Davis Date 7/12/85

Ohio Environmental Protection Agency
ENTERED DIRECTOR'S JOURNAL

JUL 1 2 1985

7. The sanitary wastewater discharges from Plants #1 and #2 are not in compliance with "Best Practical Control Treatment" (BPT) technology limits. The Federal deadline for compliance with BPT limits was July 1, 1977.

8. It is necessary to require this entity to comply with all applicable environmental laws and regulations in order to safeguard the public health, safety and welfare.

9. It is technically feasible and economically reasonable to require this entity to comply with the following Orders:

ORDERS

1. This entity shall attain compliance with the effluent limitations and monitoring requirements contained in ATTACHMENT A, for the sanitary wastewater flow from Plants #1 and #2, as expeditiously as practicable. In any event this entity shall attain compliance in accordance with the schedule set forth below:

   a. Submit written report detailing all corrective action necessary to achieve compliance with effluent limits contained in ATTACHMENT A and submit a Permit to Install application with three sets of detail plans and all the information required for plan approval, if it is determined that additional facilities are necessary by July 15, 1985.

   b. Initiate construction by August 15, 1985.

   c. Submit progress report by December 31, 1985.

   d. Submit progress report by April 30, 1986.

   e. Complete construction by June 30, 1986.

   f. Achieve compliance with final effluent limits (ATTACHMENT A) by July 30, 1986.

2. This entity shall provide written notification to the Ohio EPA, Southwest District Office of the completion of Order 1b, 1e and 1f above, within 7 days of completion.

3. This entity shall initiate an effluent monitoring program beginning on July 1, 1985 for the process wastewater outfall at plant #2, as outlined in ATTACHMENT B. After OEPA review of this data appropriate effluent limits will be established for inclusion in the NPDES permit.

4. The monitoring data required by ATTACHMENTS A & B shall be reported on the Ohio EPA report form (EPA Sur-1) on a monthly basis. Individual reports for each sampling station for each month are to be received no later than the 15th day of the next month. The original plus first copy of the report form must be signed and mailed to:

Ohio Environmental Protection Agency
Technical Records Section
Post Office Box 1049
Columbus, Ohio 43216-1049

Warren W. Tyler
Director

July 12, 1985
Date

WAIVER

Senco Products, Inc. hereby consents to the entry of these Findings and Orders on the Director's Journal and hereby waives any rights it may have to appeal the issuance of these Findings and Orders to the Environmental Board of Review or to seek judicial review of the issuance of these Findings and Orders, in law or in equity.

James P. Walsh
Authorized Representative

6/26/85
Date

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Vivian Davis Date 7/12/85

Ohio Environmental Protection Agency
ENTERED DIRECTOR'S JOURNAL

JUL 12 1985

ATTACHMENT A

1. <u>Final effluent limitations and monitoring requirements</u> for sanitary wastewater discharge at Plant #1 and Plant #2, during the period beginning on July 30, 1986, and lasting until an NPDES permit is issued, this entity is authorized to discharge in accordance with the following limitations and monitoring requirements.

EFFLUENT CHARACTERISTICS			DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
			Concentration Other Units (Specify)		Loading kg/day			
Code	REPORTING UNITS	PARAMETER	30 day	Daily	30 day	Daily	Meas. Freq.	Sample Type
50050	MGD	Flow	-	-	-	-	Daily	24 hr. total
00530	mg/l	Total Suspended Solids	12	18	-	-	2/month	grab
00310	mg/l	BOD	10	15	-	-	2/month	grab
00610	mg/l	Ammonia-N	2.0	3.0	-	-	2/month	grab
31616	#100 ml	Fecal Coliform	1000	2000			2/month	grab
50060	mg/l	Total Residual Chlorine	-	0.5	-	-	daily	grab

2. The pH shall not be less than 6.5 s.u. nor greater than 9.0 s.u. and shall be monitored 2/month by grab sample.

3. Samples are to be taken at the following locations:

   Plant 1: sanitary wastewater discharge prior to unnamed ditch tributary to an unnamed pond located behind the landfill to the east of the facility.

   Plant 2: sanitary wastewater discharge prior to unnamed ditch tributary to an unnamed pond located behind the plant.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Vivian Davis Date 7/12/85

Ohio Environmental Protection Agency
ENTERED DIRECTOR'S JOURNAL

JUL 1 2 1985

ATTACHMENT B

1. Interim effluent limitations and monitoring requirements for the process wastewater discharge at Plant #2, during the period beginning on July 1, 1985, and lasting until an NPDES permit is issued, this entity is authorized to discharge in accordance with the following effluent limitations and monitoring requirements.

EFFLUENT CHARACTERISTICS			DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
			Concentration Other Units (Specify)		Loading kg/day			
Code	REPORTING UNITS	PARAMETER	30 day	Daily	30 day	Daily	Meas. Freq.	Sample Type
50050	MGD	Flow	-	-	-	-	Daily	24 hr. total
01032	ug/l	Hexavalent Chromium	-	-	-	-	2/month	composite
01042	ug/l	Copper, total	-	-	-	-	2/month	composite
01051	ug/l	Lead total	-	-	-	-	2/month	composite
32730	ug/l	phenol	-	-	-	-	2/month	composite
00720	mg/l	Cyanide, total	-	-	-	-	2/month	composite
05300	ug/l	Suspended Solids, total	-	-	-	-	2/month	composite
01027	ug/l	Cadmium, total	-	-	-	-	2/month	composite
00335	mg/l	COD	-	-	-	-	2/month	composite

2. The pH shall be monitored twice per month by grab sample.

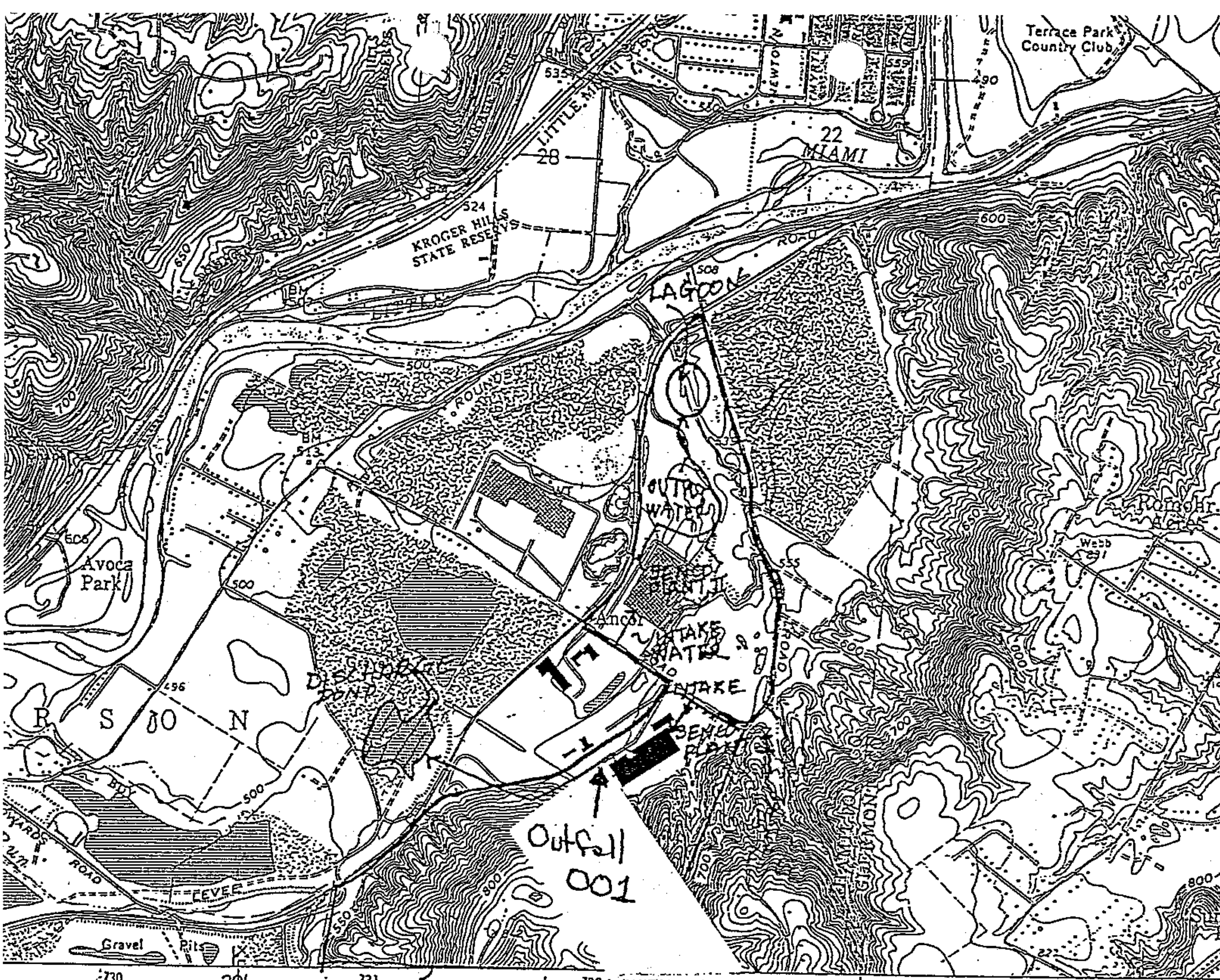
3. Samples are to be taken at the process wastewater discharge prior to mixing with the non-contact cooling water.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Vivian Davis Date 7/12/85

Ohio Environmental Protection Agency
ENTERED DIRECTOR'S JOURNAL

JUL 1 2 1985



LEGAL BOUNDARIES OF FACILITY

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

MN GN
3½°
62 MILS
1°42'
30 MILS

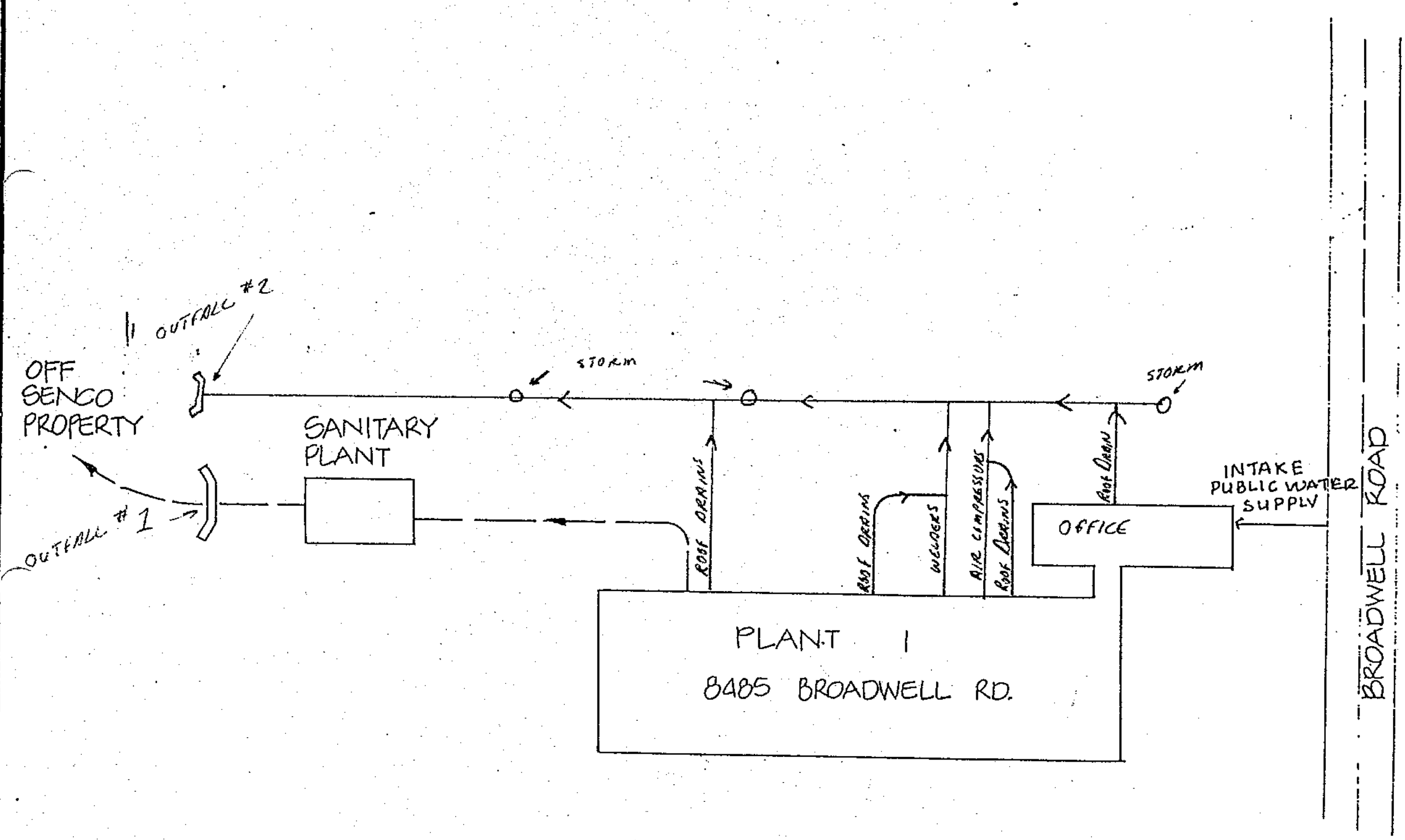
GRID AND 1988 MAGNETIC NORTH
ECLINATION AT CENTER OF SHEET

private inholdings within the boundaries of
r State reservations shown on this map

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY
DENVER, COLORADO 80225 OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Revisions shown
with State of OH
1984 and other
Map edited 198

Senco Products (Plants I & II)



NOTE: BLUEPRINTS SENT TO OEPA SUMMER 1991
RJS

SENCORP
BLOCK DIAGRAM
PLANT DISCHARGE #1
2/2/92 RJS

NPDES File

MEC

Application No. OH0046493

Issue Date: June 6, 2006

Effective Date: July 1, 2006

Expiration Date: June 30, 2011

RECEIVED
OHIO EPA

JUN 08 2006

SOUTHWEST DISTRICT

Ohio Environmental Protection Agency
Authorization to Discharge Under the
National Pollutant Discharge Elimination System

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et. seq., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

Senco Products, Inc.

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the Senco Products, Inc. - Plant 1 wastewater treatment works located at 8485 Broadwell Road, Cincinnati, Ohio, Hamilton County and discharging to an unnamed tributary to a gravel pit impoundment to the Little Miami River in accordance with the conditions specified in Parts I, II, III, IV, V and VI of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Joseph P. Koncelik

Joseph P. Koncelik
Director

Total Pages: 30

art I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

. During the period beginning on the effective date and lasting until the expiration date, the permittee is authorized to discharge in ccordance with the following limitations and monitoring requirements from outfall 1IS00003001. See Part II, OTHER REQUIREMENTS, or locations of effluent sampling.

'able - Final Outfall - 001 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
)0010 - Water Temperature - C	-	-	-	-	-	-	-	1/Week	Grab	All
)0083 - Color, Severity - Units	-	-	-	-	-	-	-	1/Day	Estimate	All
)0300 - Dissolved Oxygen - mg/l	-	5.0	-	-	-	-	-	1/Week	Grab	All
)0400 - pH - S.U.	9.0	6.5	-	-	-	-	-	1 / 2 Weeks	Grab	All
)0530 - Total Suspended Solids - mg/l	18	-	-	12	0.682	-	0.455	1 / 2 Weeks	Grab	All
)0610 - Nitrogen, Ammonia (NH3) - mg/l	3.0	-	-	2.0	0.114	-	0.0757	1 / 2 Weeks	Grab	All
)1330 - Odor, Severity - Units	-	-	-	-	-	-	-	1/Day	Estimate	All
)1350 - Turbidity, Severity - Units	-	-	-	-	-	-	-	1/Day	Estimate	All
31616 - Fecal Coliform - #/100 ml	2000	-	-	1000	-	-	-	1 / 2 Weeks	Grab	Summer
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	Estimate	All
50060 - Chlorine, Total Residual - mg/l	0.019	-	-	-	-	-	-	1 / 2 Weeks	Grab	Summer
80082 - CBOD 5 day - mg/l	15	-	-	10	0.568	-	0.379	1 / 2 Weeks	Grab	All

Notes for Station Number 1IS00003001:

This outfall is limited to treated effluent from a sanitary sewage wastewater treatment works. No process wastewater shall be released to the anitary sewage treatment works.

* Effluent loadings based on average design flow of 0.01 MGD.

Total Residual Chlorine - See Part II, Item G.

Color, Odor and Turbidity - See Part II, Item E.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 1IS00003002. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Notes for Station Number 1IS00003002:

- This outfall is limited to stormwater, free from process waste and other contaminants.

- Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, report "AL" in the first column of the first day of the month on the 4500 Form (Monthly Operating Report). A signature is still required.

- See Parts IV, V, and VI for this outfall.

Part I, B. - SLUDGE MONITORING REQUIREMENTS

1. Sludge Monitoring. During the period beginning on the effective date and lasting until the expiration date, the permittee shall monitor the treatment works' final sludge at Station Number 1IS00003588, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sludge sampling.

Table - Sludge Monitoring - 588 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day			Measuring	Sampling	Monitoring
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Frequency	Type	Months
70316 - Sludge Weight - Dry Tons	-	-	-	-	-	-	-	1/Year	Total	December
80991 - Sludge Volume, Gallons - Gals	-	-	-	-	-	-	-	1/Year	Total	December

NOTES for Station Number 1IS00003588:

- Monitoring is required when sewage sludge is removed from the Permittee's facility for transfer to another NPDES permit holder. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

- See Part II, Item I.

Part II, OTHER REQUIREMENTS

A. The wastewater treatment works must be under supervision of a Class I State certified operator as required by rule 3745-7- 02 of the Ohio Administrative Code.

B. Description of the location of the required sampling stations are as follows:

Sampling Station	Description of Location
1IS00003001	Final effluent to unnamed trib of gravel quarry to Little Miami River (Lat: 39N 07' 45"; Long: 84W 18' 45")
1IS00003002	Storm water outfall to unnamed trib of gravel quarry to Little Miami River (Lat: 39N 07' 45"; Long: 84W 18' 54")
1IS00003588.	Sludge hauled for disposal a Publicly Owned Treatment Works

C. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved.

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
2. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

D. All parameters, except flow, need not be monitored on days when the plant is not normally staffed (Saturdays, Sundays, and Holidays). On those days, report "AN" on the monthly report form.

E. If Severity Units are required for Turbidity, Odor, or Color, use the following table to determine the value between 0 and 4 that is reported.

REPORTED VALUE*	SEVERITY DESCRIPTION	TURBIDITY	ODOR	COLOR
0	None	Clear	None	Colorless
1	Mild			
2	Moderate	Light Solids	Musty	Grey
3	Serious			
4	Extreme	Heavy Solids	Septic	Black

* Interpolate between the descriptive phrases.

F. Grab samples shall be collected at such times and locations, and in such fashion, as to be representative of the facility's performance.

G. The parameters below have had effluent limitations established that are below the Ohio EPA Quantification Level (OEPA QL) for the approved analytical procedure promulgated at 40 CFR 136. OEPA QLs may be expressed as Practical Quantification Levels (PQL) or Minimum Levels (ML).

Compliance with an effluent limit that is below the OEPA QL is determined in accordance with ORC Section 6111.13 and OAC Rule 3745-33-07(C). For maximum effluent limits, any value reported below the OEPA QL shall be considered in compliance with the effluent limit. For average effluent limits, compliance shall be determined by taking the arithmetic mean of values reported for a specified averaging period, using zero (0) for any value reported at a concentration less than the OEPA QL, and comparing that mean to the appropriate average effluent limit. An arithmetic mean that is less than or equal to the average effluent limit shall be considered in compliance with that limit.

The permittee must utilize the lowest available detection method currently approved under 40 CFR Part 136 for monitoring these parameters.

REPORTING:

All analytical results, even those below the OEPA QL (listed below), shall be reported. Analytical results are to be reported as follows:

1. Results above the QL: Report the analytical result for the parameter of concern.

2. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

3. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

The following table of quantification levels will be used to determine compliance with NPDES permit limits:

Parameter.	PQL.	ML
Chlorine, Total Residual	0.050 mg/l.	--

This permit may be modified, or, alternatively, revoked and reissued, to include more stringent effluent limits or conditions if information generated as a result of the conditions of this permit indicate the presence of these pollutants in the discharge at levels above the water quality based effluent limit (WQBEL).

H. Final permit limitations based on preliminary or approved waste load allocations are subject to change based on modifications to or finalization of the allocation or report or changes to Water Quality Standards. Monitoring requirements and/or special conditions of this permit are subject to change based on regulatory or policy changes.

I. Not later than January 31 of each calendar year, the permittee shall submit two (2) copies of a report summarizing the sludge disposal and/or reuse activities of the facility during the previous year. One copy of the report shall be sent to the Ohio EPA, Division of Surface Water, Central Office, and one copy of the report shall be sent to the appropriate Ohio EPA District Office. This report shall address:

1. Amount of sludge disposed of/reused in dry tons.

2. Method(s) of disposal/reuse.

3. Summary of all analyses made on the sludge, including any priority pollutant scans that may have been performed. (If a priority pollutant scan has been conducted as a part of the pretreatment program, the most recent analysis should be submitted.)

4. Problems encountered including any complaints received. The cause or reason for the problem and corrective actions taken to solve the problem should also be included. Any incidents of interference with the method of sludge disposal shall be identified, along with the cause of interference (i.e., excessive metals concentration, contaminated sludge, etc.) and the corrective actions taken.

PART III - GENERAL CONDITIONS

1. DEFINITIONS

"Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

"Average weekly" discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week. Each of the following 7-day periods is defined as a calendar week: Week 1 is Days 1 - 7 of the month; Week 2 is Days 8 - 14; Week 3 is Days 15 - 21; and Week 4 is Days 22 - 28. If the "daily discharge" on days 29, 30 or 31 exceeds the "average weekly" discharge limitation, Ohio EPA may elect to evaluate the last 7 days of the month as Week 4 instead of Days 22 - 28. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"Average monthly" discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"85 percent removal" means the arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period.

"Absolute Limitations" Compliance with limitations having descriptions of "shall not be less than," "nor greater than," "shall not exceed," "minimum," or "maximum" shall be determined from any single value for effluent samples and/or measurements collected.

"Net concentration" shall mean the difference between the concentration of a given substance in a sample taken of the discharge and the concentration of the same substances in a sample taken at the intake which supplies water to the given process. For the purpose of this definition, samples that are taken to determine the net concentration shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"Net Load" shall mean the difference between the load of a given substance as calculated from a sample taken of the discharge and the load of the same substance in a sample taken at the intake which supplies water to given process. For purposes of this definition, samples that are taken to determine the net loading shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"MGD" means million gallons per day.

"mg/l" means milligrams per liter.

"ug/l" means micrograms per liter.

"ng/l" means nanograms per liter.

"S.U." means standard pH unit.

"kg/day" means kilograms per day.

"Reporting Code" is a five digit number used by the Ohio EPA in processing reported data. The reporting code does not imply the type of analysis used nor the sampling techniques employed.

"Quarterly (1/Quarter) sampling frequency" means the sampling shall be done in the months of March, June, August, and December, unless specificially identified otherwise in the Effluent Limitations and Monitoring Requirements table.

"Yearly (1/Year) sampling frequency" means the sampling shall be done in the month of September, unless specificially identified otherwise in the effluent limitations and monitoring requirements table.

"Semi-annual (2/Year) sampling frequency" means the sampling shall be done during the months of June and December, unless specificially identified otherwise.

"Winter" shall be considered to be the period from November 1 through April 30.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Summer" shall be considered to be the period from May 1 through October 31.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

"Sewage sludge" means a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works as defined in section 6111.01 of the Revised Code. "Sewage sludge" includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes. "Sewage sludge" does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator, grit and screenings generated during preliminary treatment of domestic sewage in a treatment works, animal manure, residue generated during treatment of animal manure, or domestic septage.

"Sewage sludge weight" means the weight of sewage sludge, in dry U.S. tons, including admixtures such as liming materials or bulking agents. Monitoring frequencies for sewage sludge parameters are based on the reported sludge weight generated in a calendar year (use the most recent calendar year data when the NPDES permit is up for renewal).

"Sewage sludge fee weight" means the weight of sewage sludge, in dry U.S. tons, excluding admixtures such as liming materials or bulking agents. Annual sewage sludge fees, as per section 3745.11(Y) of the Ohio Revised Code, are based on the reported sludge fee weight for the most recent calendar year.

2. GENERAL EFFLUENT LIMITATIONS

The effluent shall, at all times, be free of substances:

A. In amounts that will settle to form putrescent, or otherwise objectionable, sludge deposits; or that will adversely affect aquatic life or water fowl;

B. Of an oily, greasy, or surface-active nature, and of other floating debris, in amounts that will form noticeable accumulations of scum, foam or sheen;

C. In amounts that will alter the natural color or odor of the receiving water to such degree as to create a nuisance;

D. In amounts that either singly or in combination with other substances are toxic to human, animal, or aquatic life;

E. In amounts that are conducive to the growth of aquatic weeds or algae to the extent that such growths become inimical to more desirable forms of aquatic life, or create conditions that are unsightly, or constitute a nuisance in any other fashion;

F. In amounts that will impair designated instream or downstream water uses.

3. FACILITY OPERATION AND QUALITY CONTROL

All wastewater treatment works shall be operated in a manner consistent with the following:

A. At all times, the permittee shall maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee necessary to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with conditions of the permit.

B. The permittee shall effectively monitor the operation and efficiency of treatment and control facilities and the quantity and quality of the treated discharge.

C. Maintenance of wastewater treatment works that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by Ohio EPA as specified in the Paragraph in the PART III entitled, "UNAUTHORIZED DISCHARGES".

4. REPORTING

A. Monitoring data required by this permit may be submitted in hardcopy format on the Ohio EPA 4500 report form pre-printed by Ohio EPA or an approved facsimile. Ohio EPA 4500 report forms for each individual sampling station are to be received no later than the 15th day of the month following the month-of-interest. The original report form must be signed and mailed to:

Ohio Environmental Protection Agency
Lazarus Government Center
Division of Surface Water
Enforcement Section ES/MOR
P.O. Box 1049
Columbus, Ohio 43216-1049

Monitoring data may also be submitted electronically using Ohio EPA developed SWIMware software. Data must be transmitted to Ohio EPA via electronic mail or the bulletin board system by the 20th day of the month following the month-of-interest. A Surface Water Information Management System (SWIMS) Memorandum of Agreement (MOA) must be signed by the responsible official and submitted to Ohio EPA to receive an authorized Personal Identification Number (PIN) prior to sending data electronically. A hardcopy of the Ohio EPA 4500 form must be generated via SWIMware, signed and maintained onsite for records retention purposes.

B. If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified below, the results of such monitoring shall be included in the calculation and reporting of the values required in the reports specified above.

C. Analyses of pollutants not required by this permit, except as noted in the preceding paragraph, shall not be reported on Ohio EPA report form (4500) but records shall be retained as specified in the paragraph entitled "RECORDS RETENTION".

5. SAMPLING AND ANALYTICAL METHOD

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored flow. Test procedures for the analysis of pollutants shall conform to regulation 40 CFR 136, "Test Procedures For The Analysis of Pollutants" unless other test procedures have been specified in this permit. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to insure accuracy of measurements.

6. RECORDING OF RESULTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

A. The exact place and date of sampling; (time of sampling not required on EPA 4500)

B. The person(s) who performed the sampling or measurements;

C. The date the analyses were performed on those samples;

D. The person(s) who performed the analyses;

E. The analytical techniques or methods used; and

F. The results of all analyses and measurements.

7. RECORDS RETENTION

The permittee shall retain all of the following records for the wastewater treatment works for a minimum of three years except those records that pertain to sewage sludge disposal, use, storage, or treatment, which shall be kept for a minimum of five years, including:

A. All sampling and analytical records (including internal sampling data not reported);

B. All original recordings for any continuous monitoring instrumentation;

C. All instrumentation, calibration and maintenance records;

D. All plant operation and maintenance records;

E. All reports required by this permit; and

F. Records of all data used to complete the application for this permit for a period of at least three years, or five years for sewage sludge, from the date of the sample, measurement, report, or application.

These periods will be extended during the course of any unresolved litigation, or when requested by the Regional Administrator or the Ohio EPA. The three year period, or five year period for sewage sludge, for retention of records shall start from the date of sample, measurement, report, or application.

8. AVAILABILITY OF REPORTS

Except for data determined by the Ohio EPA to be entitled to confidential status, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the appropriate district offices of the Ohio EPA. Both the Clean Water Act and Section 6111.05 Ohio Revised Code state that effluent data and receiving water quality data shall not be considered confidential.

9. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

10. RIGHT OF ENTRY

The permittee shall allow the Director or an authorized representative upon presentation of credentials and other documents as may be required by law to:

A. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit.

C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.

D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

11. UNAUTHORIZED DISCHARGES

A. Bypassing or diverting of wastewater from the treatment works is prohibited unless:

1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of downtime. This condition is not satisfied if adequate back up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

3. The permittee submitted notices as required under paragraph D. of this section,

B. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

C. The Director may approve an unanticipated bypass after considering its adverse effects, if the Director determines that it has met the three conditions listed in paragraph 11.A. of this section.

D. The permittee shall submit notice of an unanticipated bypass as required in section 12. A.

E. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded if that bypass is for essential maintenance to assure efficient operation.

12. NONCOMPLIANCE NOTIFICATION

A. The permittee shall by telephone report any of the following within twenty-four (24) hours of discovery at (toll free) 1-800-282-9378:

1. Any noncompliance which may endanger health or the environment;

2. Any unanticipated bypass which exceeds any effluent limitation in the permit; or

3. Any upset which exceeds any effluent limitation in the permit.

4. Any violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit.

B. For the telephone reports required by Part 12.A., the following information must be included:

1. The times at which the discharge occurred, and was discovered;

2. The approximate amount and the characteristics of the discharge;

3. The stream(s) affected by the discharge;

4. The circumstances which created the discharge;

5. The names and telephone numbers of the persons who have knowledge of these circumstances;

6. What remedial steps are being taken; and

7. The names and telephone numbers of the persons responsible for such remedial steps.

C. These telephone reports shall be confirmed in writing within five days of the discovery of the discharge and/or noncompliance and submitted to the appropriate Ohio EPA district office. The report shall include the following:

1. The limitation(s) which has been exceeded;

2. The extent of the exceedance(s);

3. The cause of the exceedance(s);

4. The period of the exceedance(s) including exact dates and times;

5. If uncorrected, the anticipated time the exceedance(s) is expected to continue, and

6. Steps being taken to reduce, eliminate, and/or prevent occurrence of the exceedance(s).

D. Compliance Schedule Events:

If the permittee is unable to meet any date for achieving an event, as specified in the schedule of compliance, the permittee shall submit a written report to the appropriate district office of the Ohio EPA within 14 days of becoming aware of such situation. The report shall include the following:

1. The compliance event which has been or will be violated;

2. The cause of the violation;

3. The remedial action being taken;

4. The probable date by which compliance will occur; and

5. The probability of complying with subsequent and final events as scheduled.

E. The permittee shall report all instances of noncompliance not reported under paragraphs A, B, or C of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraphs B and C of this section.

F. Where the permittee becomes aware that it failed to submit any relevant application or submitted incorrect information in a permit application or in any report to the director, it shall promptly submit such facts or information.

13. RESERVED

14. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

15. AUTHORIZED DISCHARGES

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than, or at a level in excess of, that authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such violations may result in the imposition of civil and/or criminal penalties as provided for in Section 309 of the Act and Ohio Revised Code Sections 6111.09 and 6111.99.

16. DISCHARGE CHANGES

The following changes must be reported to the appropriate Ohio EPA district office as soon as practicable:

A. For all treatment works, any significant change in character of the discharge which the permittee knows or has reason to believe has occurred or will occur which would constitute cause for modification or revocation and reissuance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. Notification of permit changes or anticipated noncompliance does not stay any permit condition.

B. For publicly owned treatment works:

1. Any proposed plant modification, addition, and/or expansion that will change the capacity or efficiency of the plant;

2. The addition of any new significant industrial discharge; and

3. Changes in the quantity or quality of the wastes from existing tributary industrial discharges which will result in significant new or increased discharges of pollutants.

C. For non-publicly owned treatment works, any proposed facility expansions, production increases, or process modifications, which will result in new, different, or increased discharges of pollutants.

Following this notice, modifications to the permit may be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. A determination will also be made as to whether a National Environmental Policy Act (NEPA) review will be required. Sections 6111.44 and 6111.45, Ohio Revised Code, require that plans for treatment works or improvements to such works be approved by the Director of the Ohio EPA prior to initiation of construction.

D. In addition to the reporting requirements under 40 CFR 122.41(l) and per 40 CFR 122.42(a), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:

1. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis of any toxic pollutant which is not limited in the permit. If that discharge will exceed the highest of the "notification levels" specified in 40 CFR Sections 122.42(a)(1)(i) through 122.42(a)(1)(iv).

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the "notification levels" specified in 122.42(a)(2)(i) through 122.42(a)(2)(iv).

17. TOXIC POLLUTANTS

The permittee shall comply with effluent standards or prohibitions established under Section 307 (a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement. Following establishment of such standards or prohibitions, the Director shall modify this permit and so notify the permittee.

18. PERMIT MODIFICATION OR REVOCATION

A. After notice and opportunity for a hearing, this permit may be modified or revoked, by the Ohio EPA, in whole or in part during its term for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this permit;

2. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

3. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

B. Pursuant to rule 3745-33-04, Ohio Administrative Code, the permittee may at any time apply to the Ohio EPA for modification of any part of this permit. The filing of a request by the permittee for a permit modification or revocation does not stay any permit condition. The application for modification should be received by the appropriate Ohio EPA district office at least ninety days before the date on which it is desired that the modification become effective. The application shall be made only on forms approved by the Ohio EPA.

19. TRANSFER OF OWNERSHIP OR CONTROL

This permit may be transferred or assigned and a new owner or successor can be authorized to discharge from this facility, provided the following requirements are met:

A. The permittee shall notify the succeeding owner or successor of the existence of this permit by a letter, a copy of which shall be forwarded to the appropriate Ohio EPA district office. The copy of that letter will serve as the permittee's notice to the Director of the proposed transfer. The copy of that letter shall be received by the appropriate Ohio EPA district office sixty (60) days prior to the proposed date of transfer;

B. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgement that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) shall be submitted to the appropriate Ohio EPA district office within sixty days after receipt by the district office of the copy of the letter from the permittee to the succeeding owner;

At anytime during the sixty (60) day period between notification of the proposed transfer and the effective date of the transfer, the Director may prevent the transfer if he concludes that such transfer will jeopardize compliance with the terms and conditions of the permit. If the Director does not prevent transfer, he will modify the permit to reflect the new owner.

20. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

21. SOLIDS DISPOSAL

Collected grit and screenings, and other solids other than sewage sludge, shall be disposed of in such a manner as to prevent entry of those wastes into waters of the state, and in accordance with all applicable laws and rules.

22. CONSTRUCTION AFFECTING NAVIGABLE WATERS

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

23. CIVIL AND CRIMINAL LIABILITY

Except as exempted in the permit conditions on UNAUTHORIZED DISCHARGES or UPSETS, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

24. STATE LAWS AND REGULATIONS

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

25. PROPERTY RIGHTS

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

26. UPSET

The provisions of 40 CFR Section 122.41(n), relating to "Upset," are specifically incorporated herein by reference in their entirety. For definition of "upset," see Part III, Paragraph 1, DEFINITIONS.

27. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

28. SIGNATORY REQUIREMENTS

All applications submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR 122.22.

All reports submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR Section 122.22.

29. OTHER INFORMATION

A. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

B. ORC 6111.99 provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

C. ORC 6111.99 states that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

D. ORC 6111.99 provides that any person who violates Sections 6111.04, 6111.042, 6111.05, or division (A) of Section 6111.07 of the Revised Code shall be fined not more than $25,000 or imprisoned not more than one year, or both.

30. NEED TO HALT OR REDUCE ACTIVITY

40 CFR 122.41(c) states that it shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with conditions of this permit.

31. APPLICABLE FEDERAL RULES

All references to 40 CFR in this permit mean the version of 40 CFR which is effective as of the effective date of this permit.

32. AVAILABILITY OF PUBLIC SEWERS

Not withstanding the issuance or non-issuance of an NPDES permit to a semi-public disposal system, whenever the sewage system of a publicly owned treatment works becomes available and accessible, the permittee operating any semi-public disposal system shall abandon the semi-public disposal system and connect it into the publicly owned treatment works.

Part IV. STORM WATER POLLUTION PREVENTION PLANS

A storm water pollution prevention plan (plan) shall be developed to address each outfall that discharges to waters of the state that contains storm water associated with industrial activity. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in storm water discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. Facilities must implement the provisions of the storm water pollution prevention plan required under this part as a condition of this permit.

A. Deadlines for Plan Preparation and Compliance.

1. The plan for a storm water discharge associated with industrial activity:

   a. shall be prepared within six months of the effective date of this permit (and updated as appropriate);
   b. shall provide for implementation and compliance with the terms of the plan within twelve months of the effective date of this permit.

2. Upon a showing of good cause, the Director may establish a later date for preparing and compliance with a plan for a storm water discharge associated with industrial activity.

B. Signature and Plan Review.

1. The plan shall be signed in accordance with Part VI, and be retained on-site at the facility which generates the storm water discharge.

2. The permittee shall make plans available upon request to the Ohio EPA Director, or authorized representative, or Regional Administrator of U.S. EPA, or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system, to the operator of the municipal system.

3. The Director may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Part. Within 30 days of such notification from the Director, the permittee shall make the required changes to the plan and shall submit to the Director a written certification that the requested changes have been made.

4. All storm water pollution prevention plans required under this permit are considered reports that shall be available to the public under Section 308(b) of the Act. The permittee may claim any portion of a storm water pollution plan as confidential in accordance with 40 CFR Part 2 and does not have to release any portion of the plan describing facility security measures (such as provided for in Part IV.D.7.b.(8) of this permit). An interested party wishing a copy of a discharger's SWP3 will have to contact the Ohio EPA to obtain a copy.

C. Keeping Plans Current.

The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the State or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under Part IV.D.2 of this permit, or otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Amendments to the plan may be reviewed by Ohio EPA in the same manner as Part IV.B above.

D. Contents of Plan. The plan shall include, at a minimum, the following items:

1. Pollution Prevention Team - Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team that are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

2. Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials which may potentially be significant pollutant sources. Each plan shall include, at a minimum:

Part IV. STORM WATER POLLUTION PREVENTION PLANS (continued)

D. (continued)

a. Drainage.

(1) A site map indicating an outline of the drainage area of each storm water outfall, each existing structural control measure to reduce pollutants in storm water runoff, surface water bodies, locations where significant materials are exposed to precipitation, locations where major spills or leaks identified under Part IV.D.2.c of this permit have occurred, and the locations of the following activities where such activities are exposed to precipitation: fueling stations, vehicle

and equipment maintenance and/or cleaning areas, loading/unloading areas, locations used for the treatment, storage or disposal of wastes, liquid storage tanks, processing areas and storage areas.

(2) For each area of the facility that generates storm water discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow, and an estimate of the types of pollutants which are likely to be present in storm water discharges associated with industrial activity. Flows with a significant potential for causing erosion shall be identified.

b. Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of three years prior to the date of the issuance of this permit and the present; method and location of on-site storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff between the time of three years prior to the date of the issuance of this permit and the present; the location and a description of existing structural and non-structural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

c. Spills and Leaks. A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at the facility after the date of three years prior to the effective date of this permit.

d. Sampling Data. A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility.

e. Risk Identification and Summary of Potential Pollutant Sources. A narrative description of the potential pollutant sources at the following areas: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and on-site waste disposal practices. The description shall specifically list any significant potential source of pollutants at the site and for each potential source, any pollutant or pollutant parameter (e.g. biochemical oxygen demand, etc.) of concerns shall be identified.

3. Measures and Controls. Each facility covered by this permit shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

a. Good Housekeeping - Good housekeeping requires the maintenance of a clean, orderly facility.

b. Preventive Maintenance - A preventive maintenance program shall involve inspection and maintenance of storm water management devices (e.g. cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

c. Spill Prevention and Response Procedures - Areas where potential spills can occur, and their accompanying drainage points shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up should be available to personnel.

Part IV. STORM WATER POLLUTION PREVENTION PLANS (continued)

D. (continued)

d. Inspections - In addition to or as part of the comprehensive site evaluation required under Part IV.4. of this permit, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility at appropriate intervals specified in the plan. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained.

e. Employee Training - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The plan shall identify periodic dates for such training.

f. Recordkeeping and Internal Reporting Procedures - A description of incidents such as spills, or other discharges, along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

g. Non-Storm Water Discharges

(1) The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the storm water discharge associated with industrial activity does not have access to an outfall, manhole, or other point of access to the ultimate conduit which receives the discharge. In such cases, the source identification section of the storm water pollution plan shall indicate why the certification required by this part was not feasible, along with the identification of potential significant sources of non-storm water at the site. A discharger that is unable to provide the certification required by this paragraph must notify in accordance with Part IV.A of this permit.

(2) Except for flows from fire fighting activities, sources of non-storm water listed in Part VI of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

h. Sediment and Erosion Control - The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures to limit erosion.

i. Management of Runoff - The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those which control the source of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures determined to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity (see Parts IV.D.2.(b), (d) and (e) of this permit) shall be considered when determining reasonable and appropriate measures. Appropriate measures may include: including vegetative swales and practices, reuse of collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration devices, and wet detention/retention devices.

4. Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the plan, but, except as provided in paragraph IV.D.4.d, in no case less than once a year. Such evaluations shall provide:

a. Material handling areas and other potential sources of pollution identified in the plan in accordance with paragraph IV.D.2 of this permit shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Structural storm water management measures, sediment and control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

D. (continued)

b. Based on the results of the inspection, the description of potential pollutant sources identified in the plan in accordance with paragraph IV.D.2 of this permit and pollution prevention measures and controls identified in the plan in accordance with paragraph IV.D.3 of this permit shall be revised as appropriate within two weeks of such inspection and shall provide for implementation of any changes to the plan in a timely manner, but in no case more than twelve weeks after the inspection.

c. A report summarizing the scope of the inspection, personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph IV.D.4.b of the permit shall be made and retained as part of the storm water pollution prevention plan for at least three years. The report shall be signed in accordance with Part VI.B of this permit.

5. Additional requirements for storm water discharges associated with industrial activity through municipal separate storm sewer systems serving a population of 100,000 or more.

In addition to the applicable requirements of this permit, facilities covered by this permit must comply with applicable requirements in municipal storm water management programs developed under NPDES permits issued for the discharge of the municipal separate storm sewer system that receives the facility's discharge, provided the discharger has been notified of such conditions.

6. Consistency with other plans. Storm water pollution prevention plans may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans developed for the facility under section 311 of the Act or Best Management Practices (BMP) Programs otherwise required by a NPDES permit for the facility as long as such requirement is incorporated into the storm water pollution prevention plan.

7. Additional requirements for storm water discharges associated with industrial activity from facilities subject to SARA Title III, Section 313 requirements are not applicable to Section 313 water priority chemicals in gaseous or non-soluble liquid or solid [at atmospheric pressure and temperature] forms. In addition to the requirements of Parts IV.D.1 through 4 of this permit and other applicable conditions of this permit, storm water pollution prevention plans for facilities subject to reporting requirements under SARA Title III, Section 313 for chemicals which are classified as "Section 313 water priority chemicals" in accordance with the definition in Part VI of this permit, shall describe and ensure the implementation of practices which are necessary to provide for conformance with the following guidelines:

a. In areas where Section 313 water priority chemicals are stored, processed or otherwise handled, appropriate containment, drainage control and/or diversionary structures shall be provided. At a minimum, one of the following preventive systems or its equivalent shall be used:

(1) Curbing, culverting, gutters, sewers or other forms of drainage control to prevent or minimize the potential for storm water run-on to come into contact with significant sources of pollutants; or
(2) Roofs, covers or other forms of appropriate protection to prevent storage piles from exposure to storm water, and wind blowing.

b. In addition to the minimum standards listed under Part IV.D.7.a of this permit, the storm water pollution prevention plan shall include a complete discussion of measures taken to conform with the following applicable guidelines, other effective storm water pollution prevention procedures, and applicable State rules, regulations and guidelines:

(1) Liquid storage areas where storm water comes into contact with any equipment, tank, container, or other vessel used for Section 313 water priority chemicals.

(a) No tank or container shall be used for the storage of a Section 313 water priority chemical unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature, etc.

(b) Liquid storage areas for Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include secondary containment provided for at least the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation, a strong spill contingency and integrity testing plan, and/or other equivalent measures.

D. (continued)

(2) Material storage areas for Section 313 water priority chemicals other than liquids. Material storage areas for Section 313 water priority chemicals other than liquids which are subject to runoff, leaching, or wind blowing shall incorporate drainage or other control features which will minimize the discharge of Section 313 water priority chemicals by reducing storm water contact with Section 313 water priority chemicals.

(3) Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals. Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 water priority chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include: the placement and maintenance of drip pans where spillage may occur (such as hose connections, hose reels and filler nozzles) for use when making and breaking hose connections; a strong spill contingency and integrity testing plan; and/or other equivalent measures.

(4) In facility areas where Section 313 water priority chemicals are transferred, processed or otherwise handled. Processing equipment and materials handling equipment shall be operated so as to minimize discharges of Section 313 water priority chemicals. Materials used in piping and equipment shall be compatible with the substances handled. Drainage from process and materials handling areas shall be designed as described in paragraphs (a), (b) and (c) of this section. Additional protection such as covers or guards to prevent wind blowing, spraying or releases from pressure relief vents from causing a discharge of Section 313 water priority chemicals to the drainage system, and overhangs or door skirts to enclose trailer ends at truck loading/unloading docks shall be provided as appropriate. Visual inspections or leak tests shall be provided for overhead piping conveying Section 313 water priority chemicals without secondary containment.

(5) Discharges from areas covered by paragraphs (1), (2), (3) or (4).

(a) Drainage from areas covered by paragraphs (1), (2), (3) or (4) of this part should be restrained by valves or other positive means to prevent the discharge of a spill or other excessive leakage of Section 313 water priority chemicals. Where containment units are employed, such units may be emptied by pumps or ejectors; however, these shall be manually activated.

(b) Flapper-type drain valves shall not be used to drain containment areas. Valves used for the drainage of containment areas should, as far as is practical, be of manual, open-and-closed design.

(c) If facility drainage is not engineered as above, the final discharge of all in-facility storm sewers shall be equipped to be equivalent with a diversion system that could, in the event of an uncontrolled spill of Section 313 water priority chemicals, return the spilled material to the facility.

(d) Records shall be kept of the frequency and estimated volume (in gallons) of discharges from containment areas.

(6) Facility site runoff other than from areas covered by (1), (2), (3) or (4). Other areas of the facility (those not addressed in paragraphs (1), (2), (3) or (4)), from which runoff which may contain Section 313 water priority chemicals or spills of Section 313 water priority chemicals could cause a discharge shall incorporate the necessary drainage or other control features to prevent discharge of spilled or improperly disposed material and ensure the mitigation of pollutants in runoff or leachate.

Part IV. STORM WATER POLLUTION PREVENTION PLANS (continued)

D. (continued)

(7) Preventive maintenance and housekeeping. All areas of the facility shall be inspected at specific intervals for leaks or conditions that could lead to discharges of Section 313 water priority chemicals or direct contact of storm water with raw materials, intermediate materials, waste materials or products. In particular, facility piping, pumps, storage tanks and bins, pressure vessels, process and material handling equipment, and material bulk storage area shall be examined for any conditions or failures which could cause a discharge. Inspection shall include examination for leaks, wind blowing, corrosion, support or foundation failure, or other forms of deterioration or non-containment. Inspection intervals shall be specified in the plan and shall be based on design and operational experience. Different areas may require different inspection intervals. Where a leak or other condition is discovered which may result in significant releases of Section 313 water priority chemicals to the drainage system, corrective action shall be immediately taken or the unit or process shut down until corrective action can be taken. When a leak or non-containment of a Section 313 water priority chemical has occurred, contaminated soil, debris, or other material must be promptly removed and disposed in accordance with Federal, State, and local requirements and as described in the plan.

(8) Facility security. Facilities shall have the necessary security systems to prevent accidental or intentional entry which could cause a discharge. Security systems described in the plan shall address fencing, lighting, vehicular traffic control, and securing of equipment and buildings.

(9) Training. Facility employees and contractor personnel using the facility shall be trained in and informed of preventive measures at the facility. Employee training shall be conducted at intervals specified in the plan, but not less than once per year, in matters of pollution control laws and regulations, and in the storm water pollution prevention plan and the particular features of the facility and its operation which are designed to minimize discharges of Section 313 water priority chemicals. The plan shall designate a person who is accountable for spill prevention at the facility and who will set up the necessary spill emergency procedures and reporting requirements so that spills and emergency releases of Section 313 water priority chemicals can be isolated and contained before a discharge of a Section 313 water priority chemical can occur. Contractor or temporary personnel shall be informed of facility operation and design features in order to prevent discharges or spills from occurring.

8. Additional Requirements for Salt Storage. Storage piles of salt used for deicing or other commercial or industrial purposes and which generate a storm water discharge associated with industrial activity which is discharged to surface waters of the State shall be enclosed or covered to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile within two years of the effective date of this permit. Piles do not need to be enclosed or covered where storm water from the pile is not discharged to surface waters of the State.

Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Coal Pile Runoff Effluent Limitations. Any discharge of coal pile runoff is authorized to discharge as of the effective date of this permit and shall comply with the following effluent limitations as expeditiously as practicable, but no later than three years after the effective date of this permit. Coal pile runoff shall not be diluted with storm water or other flow in order to meet these limitations.

Units	Parameter	Daily Minimum	Daily Maximum
mg/l	Total Suspended Solids	-	50
S.U.	pH	6.0	9.0

Any untreated overflow from facilities designed, constructed and operated to treat the volume of coal pile runoff which is associated with 10 year, 24-hour rainfall event shall not be subject to the limitation for Total Suspended Solids. It is the permittee's responsibility to demonstrate to the Ohio EPA that a 10-year, 24-hour rainfall event has occurred and the volume of the overflow to which the Total Suspended Solids effluent limitation does not apply.

B. Monitoring Requirements. Only the activities described in the following matrix and associated definitions are required to conduct monitoring. The monitoring required in the following matrix shall be conducted annually. Monitoring shall be initiated within twelve months of the effective date of this permit and henceforth on an annual basis, weather conditions permitting. A permittee may, in lieu of annual monitoring, certify that industrial materials are not exposed to storm water; such certification shall be submitted to the Ohio EPA upon request of the Director.

1. MONITORING REQUIREMENTS MATRIX

Reporting Units	Parameter	INDUSTRIAL ACTIVITY CATEGORIES											
		a	b[1,2]	c	d	e	f	g	h	i[2]	j	k	l[1]
mg/l	Oil and Grease		X	X	X	X	X	X	X	X	X	X	X
mg/l	5-day Biochemical Oxygen Demand		X							X		X	
mg/l	Chemical Oxygen Demand		X	X	X	X	X		X	X			X
mg/l	Total Suspended Solids		X		X	X	X	X	X	X	X	X	X
mg/l	Total Kjeldahl Nitrogen			X								X	
mg/l	Phosphorus											X	
S.U.	pH		X	X	X	X	X	X	X	X	X	X	X
TU_a	Acute Toxicity												
Hours	Duration of Storm Event		X	X	X	X	X	X	X	X	X	X	X
Inches	Precipitation		X	X	X	X	X	X	X	X	X	X	X
Hours	Duration Between Storm Events*		X	X	X	X	X	X	X	X	X	X	X
Gallons	Volume (est)		X	X	X	X	X	X	X	X	X	X	X
mg/l	Nitrate-Nitrogen												
mg/l	Nitrite-Nitrogen												
µg/l	Lead, Total		X	X					X				
µg/l	Cadmium, Total		X[3]	X									
µg/l	Copper, Total		X[3]				X	X	X		X		
µg/l	Arsenic, Total		X[3]	X			X						
µg/l	Chromium, Total		X[3]	X			X						
mg/l	Ammonia												
µg/l	Magnesium, Total			X									

Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

B. (continued)

Reporting Units	Parameter	INDUSTRIAL ACTIVITY CATEGORIES											
		a	b[1,3]	c *	d	e	f	g	h	i[2]	j	k	l[3]
µg/l	Magnesium, Dissolved			x									
mg/l	Total Dissolved Solids			x									
mg/l	Total Organic Carbon			x									
µg/l	Barium, Total			x									
mg/l	Cyanide, Total			x									
µg/l	Mercury, Total			x									
µg/l	Selenium, Total			x									
µg/l	Silver, Total			x									
µg/l	Pentachlorophenol				x								
µg/l	Nickel, Total							x			x		
µg/l	Zinc, Total							x			x		
#/100ml	Fecal Coliform											x	

* Time between the storm event when sampling is being conducted and the last storm event producing rainfall greater than 0.1 inches.
(1) and any pollutant limited in an effluent guideline or categorical pretreatment standard which the facility is subject.
(2) and the primary ingredient used in the deicing materials used at the site (e.g., ethylene glycol, urea, etc.).
(3) Facilities that are classified as SIC 33 only because they manufacture pure silicon and/or semiconductor grade silicon are not required to monitor for this parameter.

2. Industrial Activity Categories Definitions

   a. Section 313 of SARA Title III Facilities. As of the effective date of this permit, facilities with storm water discharges associated with industrial activity that are subject to requirements to report releases into the environment under Section 313 of SARA Title III for chemicals which are classified as 'Section 313 water priority chemicals' are not (as they may have been in a previous permit) required to monitor storm water that is discharged from the facility unless required by paragraphs V.B.2.b through B.2.l.

   b. Primary Metal Industries. Facilities with storm water discharges associated with industrial activity classified as Standard Industrial Classification (SIC) 33 (Primary Metal Industry) are required to monitor such storm water that is discharged from the facility.

   c. Land Disposal Units/Incinerators/BIFs. Facilities with storm water discharges associated with industrial activity from any active or inactive landfill, land application sites or open dump without a stabilized final cover that has received any industrial wastes from a facility with a Standard Industrial Classification (SIC) of between 20-39 (manufacturing); and incinerators (including Boilers and Industrial Furnaces (BIFs)) that burn hazardous waste and operate under interim status or a permit under Subtitle C of RCRA, are required to monitor such storm water that is discharged from the facility.

   d. Wood Treatment Using Chlorophenolic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

   e. Wood Treatment Using Creosote Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

B. (continued)

f. Wood Treatment Using Chromium-Arsenic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

g. Coal Pile Runoff. Facilities with storm water discharges associated with industrial activity from coal pile runoff are required to monitor such storm water that is discharged from the facility.

h. Battery Reclaimers. Facilities with storm water discharges associated with industrial activity from areas used for storage of lead acid batteries, reclamation products, or waste products, and areas used for lead acid battery reclamation (including material handling activities) at facilities that reclaim lead acid batteries are required to monitor such storm water that is discharged from the facility.

i. Airports. At airports with over 50,000 flight operations per year, facilities with storm water discharges associated with industrial activity from areas where aircraft or airport deicing operations occur (including runways, taxiways, ramps, and dedicated aircraft deicing stations) are required to monitor such storm water that is discharged from the facility.

j. Coal-fired Steam Electric Facilities. Facilities with storm water discharges associated with industrial activity from coal handling sites at coal fired steam electric power generating facilities (other than discharges in whole or in part from coal piles subject to storm water effluent guidelines at 40 CFR 423 - which are not eligible for coverage under this permit) are required to monitor such storm water that is discharged from the facility.

k. Animal Handling / Meat Packing. Facilities with storm water discharges associated with industrial activity from animal handling areas, manure management (or storage) areas, and production waste management (or storage) areas that are exposed to precipitation at meat packing plants, poultry packing plants, and facilities that manufacture animal and marine fats and oils, are required to monitor such storm water that is discharged from the facility.

l. Additional Facilities. Facilities with storm water discharges associated with industrial activity that:

(1) come in contact with storage piles for solid chemicals used as raw materials that are exposed to precipitation at facilities classified as SIC 30 (Rubber and Miscellaneous Plastics Products) or SIC 28 (Chemicals and Allied Products);

(2) are from those areas at automobile junkyards with any of the following: (A) over 250 auto/truck bodies with drivelines (engine, transmission, axles, and wheels), 250 drivelines, or any combination thereof (in whole or in parts) are exposed to storm water; (B) over 500 auto/truck units (bodies with or without drivelines in whole or in parts) are stored exposed to storm water; or (C) over 100 units per year are dismantled and drainage or storage of automotive fluids occurs in areas exposed to storm water;

(3) come into contact with lime storage piles that are exposed to storm water at lime manufacturing facilities;

(4) are from oil handling sites at oil fired steam electric power generating facilities;

(5) are from cement manufacturing facilities and cement kilns (other than discharges in whole or in part from material storage piles subject to storm water effluent guidelines at 40 CFR 411 - which are not eligible for coverage under this permit);

(6) are from ready-mixed concrete facilities; or

(7) are from ship building and repairing facilities;

are required to monitor such storm water discharged from the facility.

B. (continued)

3. Sample Type. Take a minimum of one grab sample from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first thirty minutes was impracticable.

4. Sampling Waiver. When a discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit in lieu of sampling data a description of why samples could not be collected, including available documentation of the event. Adverse climatic conditions which may prohibit the collection of samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

5. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of features and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfalls. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g. low (under 40%), medium (40% to 65%) or high (above 65%)) shall be provided.

C. Toxicity Testing. Not Required.

D. Alternative Certification of "Not Present or No Exposure." You are not subject to the analytical monitoring requirement of this part provided: you make a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of monitoring required under this part, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, or significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to storm water and are not expected to be exposed to storm water for the certification period; and your certification is signed in accordance with Attachment VI.G and retained in the SWP3. If you cannot certify for an entire period, you must note the date exposure was eliminated and perform any monitoring required up until that date.

Part VI. OTHER STORM WATER REQUIREMENTS, DEFINITIONS AND AUTHORIZATION

A. Failure to Certify. Any facility that is unable to provide the certification required under paragraph IV.D.3.g.(1) (testing for non-storm water discharges), must notify the Director within 180 days of the effective date of this permit. Such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible.

B. Signatory Requirements. See Part III.28.

C. Definitions.

"Section 313 water priority chemical" means a chemical or chemical categories which are: 1) are listed at 40 CFR 372.65 pursuant to Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, also titled the Emergency Planning and Community Right-to-Know Act of 1986; 2) are present at or above threshold levels at a facility subject to SARA Title III, Section 313 reporting requirements; and 3) that meet at least one of the following criteria: (i) are listed in Appendix D of 40 CFR 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances); (ii) are listed as a hazardous substance pursuant to section 311(b)(2)(A) of the Act at 40 CFR 116.4; or (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

"Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

"Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or section 102 of CERCLA (see 40 CFR 302.4).

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Definition of Storm Water Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in subparagraph (xi), the term includes only storm water discharges from all areas listed in the previous sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the: storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)-(xi)) include those facilities designated under 40 CFR 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) of this paragraph);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285) 29, 311, 32 (except 323), 33, 3441, 373;

C. (continued)

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11(l)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but not limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (i)-(vii) or (ix)-(xi) of this subsection are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;

(x) Construction activity - This category of industrial activity is not regulated under this permit.

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (ii)-(x)).

"SWPPP" means storm water pollution prevention plan to be completed as a condition of this permit (see Part IV of this permit).

"Time-weighted composite" means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

"Waste pile" means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

"10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available in "Weather Bureau Technical Paper No. 40,", May 1961 and "NOAA Atlas 2," 1973 for the 11 Western States, and may be obtained from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

SENCO EPA Waste Codes (SOURCE: OEPA file review and EDR Database Report)

D001 Ignitable waste
D002 Corrosive waste
D003 Reactive waste
D010 Selenium

F001 The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichlorethylene, methylene chloride, 1,1,1- trichloroethane, carbon tetrachloride and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F002 The following spent halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2- trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2, trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F001, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F003 The following spent non-halogenated solvents: Xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent nonhalogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above nonhalogenated solvents, and a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

F005 The following spent nonhalogenated solvents: toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2- nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above nonhalogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.

U002 2-Propanone (I)

U159 2-Butanone (I,T)

U181 Benzenamine, 2-methyl-5-nitro

U210 Ethene, tetrachloro-, Tetrachloroethylene

U220 Benzene, methyl-

U226 Ethane, 1,1,1-trichloro-

U239 Xylene (I)

Figures

Site Location Map 1

Site Layout Plan 2

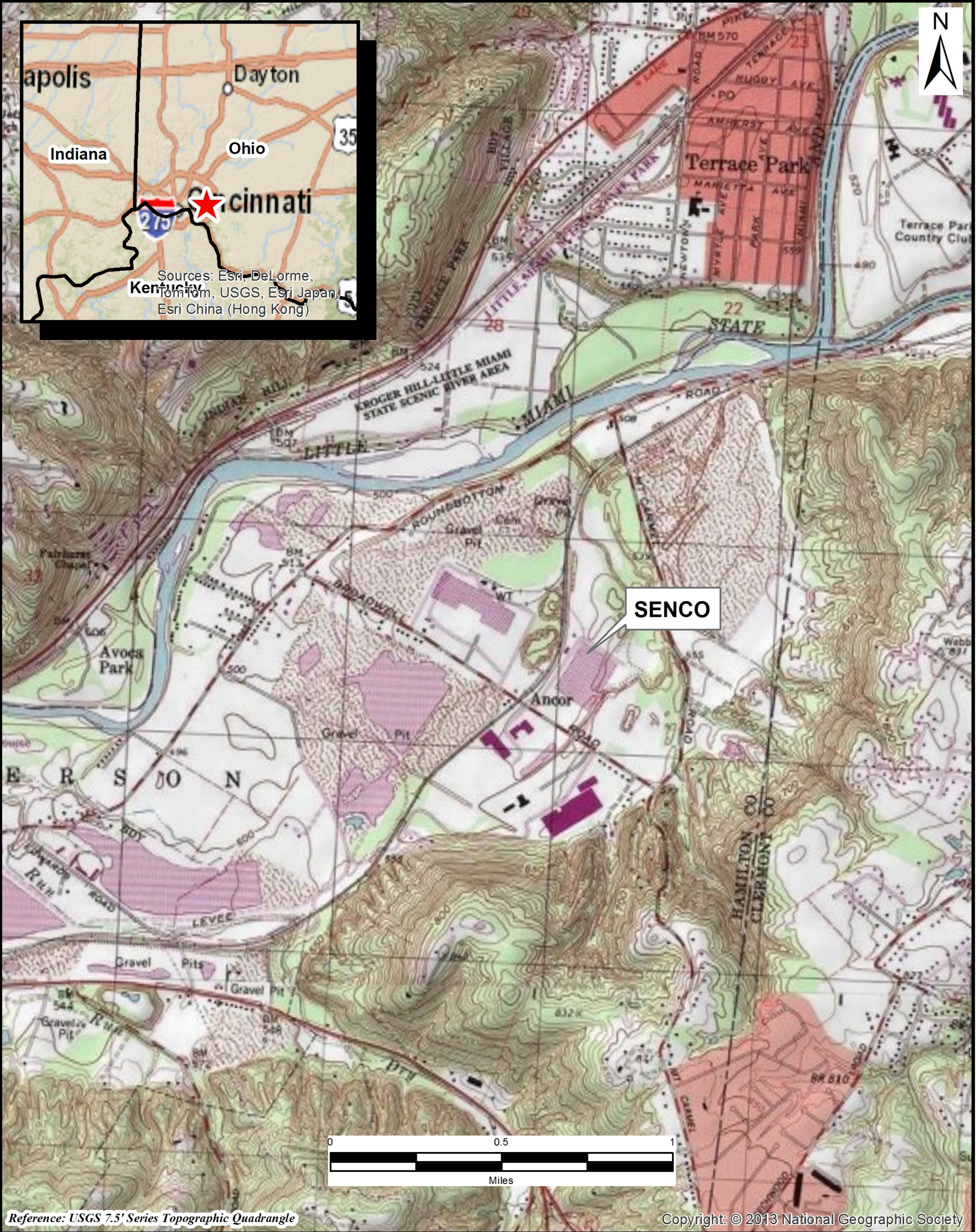
List of Appendices

Database Radius Report I

Historical Research Documentation II

November 17, 2008 Public Records Request forSenco Products........................... III

Figure 1


N
apolis
Dayton
Indiana
Ohio
Cincinnati
Kentucky
Sources: Esri, DeLorme, TomTom, USGS, Esri Japan, Esri China (Hong Kong)
SENCO
Terrace Park
Terrace Park Country Club
KROGER HILL-LITTLE MIAMI STATE SCENIC RIVER AREA
LITTLE MIAMI
Avoca Park
Ancor
Gravel Pit
HAMILTON CO
CLERMONT CO
0
0.5
1
Miles
Reference: USGS 7.5' Series Topographic Quadrangle
Copyright: © 2013 National Geographic Society

Appendix I

Database Radius Report

Senco
8450 Broadwell Road
Cincinnati, OH 45244

Inquiry Number: 3901204.2s
April 04, 2014

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION **PAGE**

Executive Summary ES1
Overview Map 2
Detail Map 3
Map Findings Summary 4
Map Findings 8
Orphan Summary 94
Government Records Searched/Data Currency Tracking GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum A-1
Physical Setting Source Summary A-2
Physical Setting Source Map A-7
Physical Setting Source Map Findings A-8
Physical Setting Source Records Searched A-6

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

8450 BROADWELL ROAD
CINCINNATI, OH 45244

COORDINATES

Latitude (North):	39.1353000 - 39˚ 8' 7.08''
Longitude (West):	84.3137000 - 84˚ 18' 49.32''
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	732191.2
UTM Y (Meters):	4335019.5
Elevation:	562 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	39084-B3 MADEIRA, OH
Most Recent Revision:	1996
South Map:	39084-A3 WITHAMSVILLE, OH KY
Most Recent Revision:	1996

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	2011, 2012
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 8 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
ACROSS THE STREET FROM (A) ADDRES ACROSS THE STREET FROM (A) ADDRESS AT 8450 BROADWELL RD CINCINNATI, OH	ERNS	N/A
SENCO PRODUCTS INC 8450 BROADWELL ROAD CINCINNATI, OH	FINDS	N/A
SENCO PRODUCTS INC PLT NO 1 8485 BROADWELL RD ANDERSON OH 45244 ANDERSON, OH 45244	ICIS	N/A

EXECUTIVE SUMMARY

ETHICON INCORPORATED 8485 BROADWELL ROAD CINCINNATI, OH	RCRA NonGen / NLR FINDS	OHD981952385
SENCO PRODUCTS INC PLANT 1 8485 BROADWELL ROAD CINCINNATI, OH 45244	RCRA NonGen / NLR	OHD004251070
SENCO PRODUCTS INC 8450 BROADWELL RD CINCINNATI, OH 45244	CORRACTS RCRA-LQG NY MANIFEST EPA WATCH LIST US AIRS	OHT400012050
8485 BROADWELL ROAD 8485 BROADWELL RD CINCINNATI, OH 45244	OH SPILLS OH NPDES	N/A
SENCO PRODUCTS 100 YDS BEHIND FACTORY-8485 BROADWELL RD CINCINNATI, OH	OH SPILLS	N/A
SENCO PRODUCTS INC. 8450 BROADWELL RD. CINCINNATI, OH 45244	OH SPILLS OH AIRS	N/A

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL - National Priority List
Proposed NPL - Proposed National Priority List Sites
NPL LIENS - Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL - National Priority List Deletions

Federal CERCLIS list

CERCLIS - Comprehensive Environmental Response, Compensation, and Liability Information System

EXECUTIVE SUMMARY

FEDERAL FACILITY - - - - - - - - Federal Facility Site Information listing

Federal institutional controls / engineering controls registries

US ENG CONTROLS - - - - - - - - Engineering Controls Sites List
US INST CONTROL - - - - - - - - Sites with Institutional Controls
LUCIS - - - - - - - - - - - - - - - - - Land Use Control Information System

State- and tribal - equivalent CERCLIS

OH SHWS - - - - - - - - - - - - - - This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State and tribal leaking storage tank lists

OH UNREG LTANKS - - - - - - - - Ohio Leaking UST File
INDIAN LUST - - - - - - - - - - - - Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

INDIAN UST - - - - - - - - - - - - - Underground Storage Tanks on Indian Land
FEMA UST - - - - - - - - - - - - - - Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

OH ENG CONTROLS - - - - - - - Sites with Engineering Controls
OH INST CONTROL - - - - - - - - Sites with Institutional Engineering Controls
OH HIST ENG CONTROLS - - - Operation & Maintenance Agreements Database
OH HIST INST CONTROLS - - Institutional Controls Database

State and tribal voluntary cleanup sites

OH VCP - - - - - - - - - - - - - - - - Voluntary Action Program Sites
INDIAN VCP - - - - - - - - - - - - - Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

OH BROWNFIELDS - - - - - - - - Ohio Brownfield Inventory

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS - - - - - - - - A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9 - - - - - - - - Torres Martinez Reservation Illegal Dump Site Locations
ODI - - - - - - - - - - - - - - - - - - - Open Dump Inventory
OH SWRCY - - - - - - - - - - - - - Recycling Facility Listing
INDIAN ODI - - - - - - - - - - - - - Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL - - - - - - - - - - - - - - - - Clandestine Drug Labs

EXECUTIVE SUMMARY

OH CDL	Clandestine Drug Lab Locations
US HIST CDL	National Clandestine Laboratory Register

Local Land Records

LIENS 2	CERCLA Lien Information

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System

Other Ascertainable Records

DOT OPS	Incident and Accident Data
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
US MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
RAATS	RCRA Administrative Action Tracking System
RMP	Risk Management Plans
OH TOWNGAS	DERR Towngas Database
OH UIC	Underground Injection Wells Listing
OH DRYCLEANERS	Drycleaner Facility Listing
OH USD	Urban Setting Designation Sites
OH HIST USD	Urban Setting Designations Database
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
OH Financial Assurance	Financial Assurance Information Listing
OH COAL ASH	Coal Ash Disposal Site Listing
OH CRO	Cessation of Regulated Operations Facility Listing
LEAD SMELTERS	Lead Smelter Sites
PRP	Potentially Responsible Parties
COAL ASH DOE	Steam-Electric Plant Operation Data
US FIN ASSUR	Financial Assurance Information
PCB TRANSFORMER	PCB Transformer Registration Database
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat	EDR Exclusive Historic Gas Stations

EXECUTIVE SUMMARY

EDR US Hist Cleaners - - - - - - - - EDR Exclusive Historic Dry Cleaners

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS NFRAP site List

CERC-NFRAP: Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

A review of the CERC-NFRAP list, as provided by EDR, and dated 10/25/2013 has revealed that there is 1 CERC-NFRAP site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
B-WAY CORPORATION	***8200 BROADWELL ROAD***	***WNW 1/4 - 1/2 (0.308 mi.)***	***C18***	***64***

Federal RCRA CORRACTS facilities list

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 09/10/2013 has revealed that there is 1 CORRACTS site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
B-WAY CORPORATION	***8200 BROADWELL ROAD***	***WNW 1/4 - 1/2 (0.308 mi.)***	***C18***	***64***

EXECUTIVE SUMMARY

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRA-TSDF list, as provided by EDR, and dated 09/10/2013 has revealed that there is 1 RCRA-TSDF site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
B-WAY CORPORATION	*8200 BROADWELL ROAD*	*WNW 1/4 - 1/2 (0.308 mi.)*	*C18*	*64*

Federal RCRA generators list

RCRA-CESQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

A review of the RCRA-CESQG list, as provided by EDR, and dated 09/10/2013 has revealed that there is 1 RCRA-CESQG site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
TRI-STAR REFRACTORIES	*8361 BROADWELL RD*	*WNW 0 - 1/8 (0.013 mi.)*	*13*	*58*

State- and tribal - equivalent CERCLIS

OH DERR: The DERR database is an index of sites for which Ohio EPA maintains files. It includes sites with known or suspected contamination, but a site's inclusion in the database does not mean that it is now or has ever been contaminated.

A review of the OH DERR list, as provided by EDR, and dated 01/09/2014 has revealed that there is 1 OH DERR site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
B-WAY CORPORATION Activity: SA	*8200 BROADWELL ROAD*	*WNW 1/4 - 1/2 (0.308 mi.)*	*C18*	*64*

EXECUTIVE SUMMARY

State and tribal landfill and/or solid waste disposal site lists

OH SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Ohio Environmental Protection Agency's Licensed Solid Waste Facilities.

A review of the OH SWF/LF list, as provided by EDR, and dated 10/29/2013 has revealed that there is 1 OH SWF/LF site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
ANDERSON TOWNSHIP LANDFILL	8311 BROADWELL RD	WNW 0 - 1/8 (0.091 mi.)	B15	62

State and tribal leaking storage tank lists

OH LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Commerce Division of State Fire Marshal's List of Reported Petroleum Underground Storage Tank Release Incidents.

A review of the OH LUST list, as provided by EDR, and dated 02/16/2014 has revealed that there are 2 OH LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
INTERPAVE CORPORATION	***8479 BROADWELL RD***	***0 - 1/8 (0.000 mi.)***	***A11***	***57***

FR Status: Inactive FR Status: NFA: No Further Action
Facility Status: Inactive FR Status: NFA: No Further Action

Lower Elevation	Address	Direction / Distance	Map ID	Page
HEEKIN CAN INC	8200 BROADWELL RD	WNW 1/4 - 1/2 (0.308 mi.)	C20	93

FR Status: Inactive FR Status: NFA: No Further Action
Facility Status: Inactive FR Status: NFA: No Further Action

State and tribal registered storage tank lists

OH UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Commerce Division of State Fire Marshal's Facility File.

A review of the OH UST list, as provided by EDR, and dated 02/16/2014 has revealed that there is 1 OH UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
INTERPAVE CORPORATION	***8479 BROADWELL RD***	***0 - 1/8 (0.000 mi.)***	***A11***	***57***

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

OH HIST LF: A list of about 1200 old abandoned dumps or landfills. This database was developed from Ohio EPA staff notebooks and other information dating from the mid-1970s.

A review of the OH HIST LF list, as provided by EDR, and dated 01/01/1980 has revealed that there is 1 OH HIST LF site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
ANDERSON TOWNSHIP LANDFILL	8311 BROADWELL ROAD	WNW 0 - 1/8 (0.091 mi.)	B16	63

Local Lists of Registered Storage Tanks

OH ARCHIVE UST: Underground storage tank records that have been removed from the Underground Storage Tank database.

A review of the OH ARCHIVE UST list, as provided by EDR, and dated 02/16/2014 has revealed that there is 1 OH ARCHIVE UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
INTERPAVE CORPORATION	8479 BROADWELL RD	SW 0 - 1/8 (0.036 mi.)	14	62

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

OH RGA LF: The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Ohio Environmental Procetion Agency in Ohio.

A review of the OH RGA LF list, as provided by EDR, has revealed that there is 1 OH RGA LF site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
ANDERSON TOWNSHIP LANDFILL	8311 BROADWELL RD	WNW 0 - 1/8 (0.091 mi.)	B17	64

OH RGA LUST: The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Commerce in Ohio.

A review of the OH RGA LUST list, as provided by EDR, has revealed that there are 3 OH RGA LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
INTERPAVE CORPORATION	8479 BROADWELL RD	0 - 1/8 (0.000 mi.)	A10	56

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
INTERPAVE CORP	8479 BROADWELL RD	0 - 1/8 (0.000 mi.)	A12	58

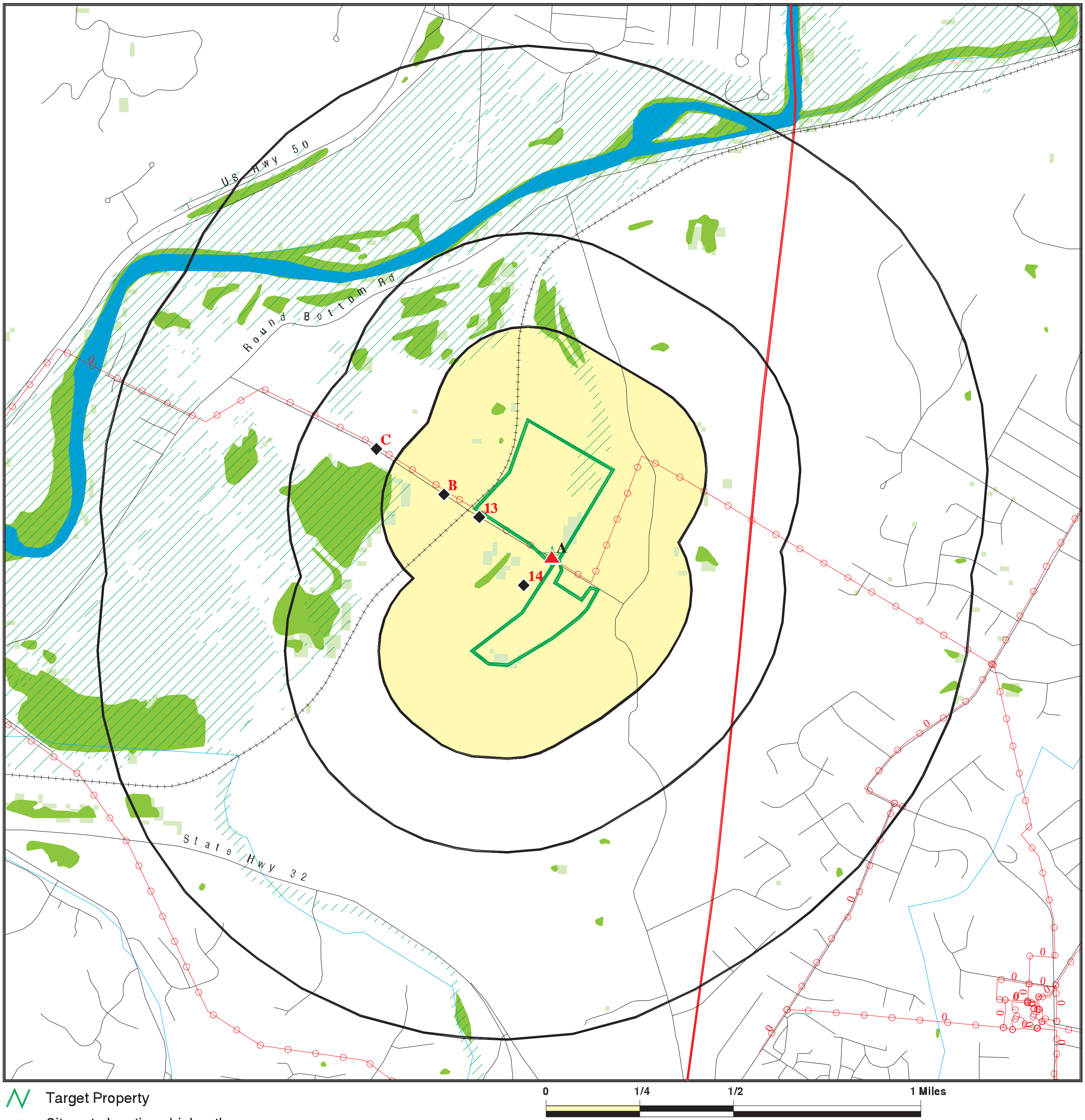
Lower Elevation	Address	Direction / Distance	Map ID	Page
HEEKIN CAN INC	8200 BROADWELL RD	WNW 1/4 - 1/2 (0.308 mi.)	C19	92

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 15 records.

Site Name	Database(s)
EZ SHOP FOOD MART	OH ARCHIVE UST
COLUMBIA TWNSHP COMPOST	OH SWF/LF
FAIRFAX, VILLAGE OF	OH SWF/LF
ASHLAND MART	OH LUST, OH UST
FORMER SERVICE STATION	OH LUST
EZ SHOP FOOD MART	OH LUST, OH UST
CLAIRE SECTION HOUSE	OH LUST
CARSTAR COLLISION CARE OF EASTGATE	RCRA-CESQG
SENCO PRODUCTS	OH SPILLS
SENCO	OH SPILLS
EASTGATE TOOL RENTAL	OH RGA LUST
ASHLAND MART	OH RGA LUST
EASTGATE TOOL RENTAL	OH RGA LUST
CITY OF CINCINNATI	OH RGA LUST
ABANDON TANK	OH RGA LUST

OVERVIEW MAP - 3901204.2s

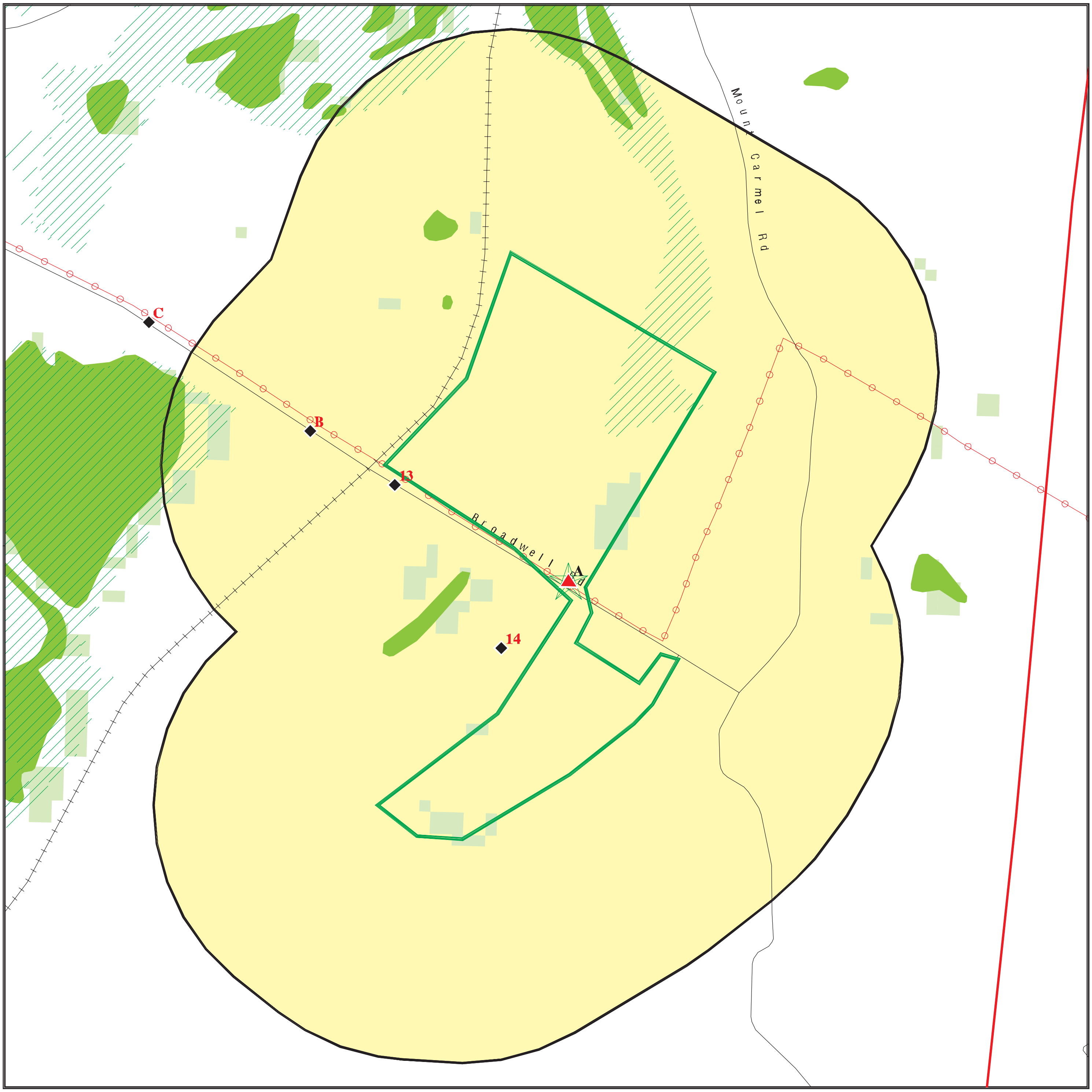


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Senco	CLIENT:	TRC Environmental Corporation
ADDRESS:	8450 Broadwell Road Cincinnati OH 45244	CONTACT:	Joe Bruns
		INQUIRY #:	3901204.2s
LAT/LONG:	39.1353 / 84.3137	DATE:	April 04, 2014 12:25 pm

DETAIL MAP - 3901204.2s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Senco ADDRESS: 8450 Broadwell Road Cincinnati OH 45244 LAT/LONG: 39.1353 / 84.3137	CLIENT: TRC Environmental Corporation CONTACT: Joe Bruns INQUIRY #: 3901204.2s DATE: April 04, 2014 12:26 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.750		0	0	0	0	NR	0
FEDERAL FACILITY	1.000		0	0	0	0	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	1	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000	1	0	0	1	0	NR	2
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	1	NR	NR	1
Federal RCRA generators list								
RCRA-LQG	0.250	1	0	0	NR	NR	NR	1
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		1	0	NR	NR	NR	1
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.125	1	0	NR	NR	NR	NR	1
State- and tribal - equivalent CERCLIS								
OH SHWS	N/A		N/A	N/A	N/A	N/A	N/A	N/A
OH DERR	1.000		0	0	1	0	NR	1
State and tribal landfill and/or solid waste disposal site lists								
OH SWF/LF	0.500		1	0	0	NR	NR	1
State and tribal leaking storage tank lists								
OH LUST	0.500		1	0	1	NR	NR	2
OH UNREG LTANKS	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
State and tribal registered storage tank lists								
OH UST	0.250		1	0	NR	NR	NR	1
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
OH ENG CONTROLS	0.500		0	0	0	NR	NR	0
OH INST CONTROL	0.500		0	0	0	NR	NR	0
OH HIST ENG CONTROLS	0.500		0	0	0	NR	NR	0
OH HIST INST CONTROLS	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
OH VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
OH BROWNFIELDS	0.500		0	0	0	NR	NR	0

ADDITIONAL ENVIRONMENTAL RECORDS

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
OH SWRCY	0.500		0	0	0	NR	NR	0
OH HIST LF	0.500		1	0	0	NR	NR	1
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
OH CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
OH ARCHIVE UST	0.250		1	0	NR	NR	NR	1
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
OH SPILLS	0.125	3	0	NR	NR	NR	NR	3
Other Ascertainable Records								
RCRA NonGen / NLR	TP	2	NR	NR	NR	NR	NR	2

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP	1	NR	NR	NR	NR	NR	1
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP	2	NR	NR	NR	NR	NR	2
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
OH TOWNGAS	1.000		0	0	0	0	NR	0
OH UIC	TP		NR	NR	NR	NR	NR	0
NY MANIFEST	0.250	1	0	0	NR	NR	NR	1
OH DRYCLEANERS	0.250		0	0	NR	NR	NR	0
OH NPDES	TP	1	NR	NR	NR	NR	NR	1
OH AIRS	TP	1	NR	NR	NR	NR	NR	1
OH USD	0.500		0	0	0	NR	NR	0
OH HIST USD	0.500		0	0	0	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
OH Financial Assurance	TP		NR	NR	NR	NR	NR	0
OH COAL ASH	0.500		0	0	0	NR	NR	0
OH CRO	TP		NR	NR	NR	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
US AIRS	TP	1	NR	NR	NR	NR	NR	1
PRP	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
EPA WATCH LIST	TP	1	NR	NR	NR	NR	NR	1

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		0	0	NR	NR	NR	0
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
OH RGA LF	0.500		1	0	0	NR	NR	1

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
OH RGA LUST	0.500		2	0	1	NR	NR	3

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

N/A = This State does not maintain a SHWS list. See the Federal CERCLIS list.

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

A1
Target Property

ACROSS THE STREET FROM (A) ADDRESS AT 8450 BROADWELL RD
CINCINNATI, OH

ERNS **8871499**
N/A

Site 1 of 12 in cluster A

Actual:
562 ft.

Click this hyperlink while viewing on your computer to access additional ERNS detail in the EDR Site Report.

A2
Target Property

SENCO PRODUCTS INC
8450 BROADWELL ROAD
CINCINNATI, OH

FINDS **1016131034**
N/A

Site 2 of 12 in cluster A

Actual:
562 ft.

FINDS:

Registry ID: 110000393887

Environmental Interest/Information System

AFS (Aerometric Information Retrieval System (AIRS) Facility Subsystem) replaces the former Compliance Data System (CDS), the National Emission Data System (NEDS), and the Storage and Retrieval of Aerometric Data (SAROAD). AIRS is the national repository for information concerning airborne pollution in the United States. AFS is used to track emissions and compliance data from industrial plants. AFS data are utilized by states to prepare State Implementation Plans to comply with regulatory programs and by EPA as an input for the estimation of total national emissions. AFS is undergoing a major redesign to support facility operating permits required under Title V of the Clean Air Act.

The NEI (National Emissions Inventory) database contains information on stationary and mobile sources that emit criteria air pollutants and their precursors, as well as hazardous air pollutants (HAPs).

US EPA TRIS (Toxics Release Inventory System) contains information from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

US National Pollutant Discharge Elimination System (NPDES) module of the Compliance Information System (ICIS) tracks surface water permits issued under the Clean Water Act. Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

HAZARDOUS WASTE BIENNIAL REPORTER

The OH-CORE (Ohio - Core) database contains information commonly

SENCO PRODUCTS INC (Continued) **1016131034**

shared among the Ohio EPA environmental programs. The information is facility-based, general in nature, and used to support specific programmatic systems while simultaneously maintaining an inventory of common facility-related data. Specific programmatic details are maintained in programmatic databases.

CRITERIA AND HAZARDOUS AIR POLLUTANT INVENTORY

PCS (Permit Compliance System) is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

A3
Target
Property

SENCO PRODUCTS INC PLT NO 1
8485 BROADWELL RD ANDERSON OH 45244
ANDERSON, OH 45244

ICIS **1011555547**
N/A

Site 3 of 12 in cluster A

Actual:
562 ft.

ICIS:

Enforcement Action ID:	05-1985-0412
FRS ID:	110001624957
Program ID:	OH-CORE 20548
Action Name:	SENCO PRODUCTS, INC.
Facility Name:	SENCO PRODUCTS INC PLT NO 1
Facility Address:	8485 BROADWELL RD ANDERSON OH 45244 ANDERSON, Ohio 45244
Enforcement Action Type:	Civil Judicial Action
Facility County:	Hamilton
EPA Region #:	5

Enforcement Action ID:	05-1985-0412
FRS ID:	110001624957
Program ID:	BR OHD004251070
Action Name:	SENCO PRODUCTS, INC.
Facility Name:	SENCO PRODUCTS INC PLANT 1
Facility Address:	8485 BROADWELL RD ANDERSON OH 45244 ANDERSON, Ohio 45244
Enforcement Action Type:	Civil Judicial Action
Facility County:	Hamilton
EPA Region #:	5

Enforcement Action ID:	05-1985-0412
FRS ID:	110001624957
Program ID:	RCRAINFO OHD004251070
Action Name:	SENCO PRODUCTS, INC.
Facility Name:	SENCO PRODUCTS INC
Facility Address:	8485 BROADWELL RD ANDERSON OH 45244 ANDERSON, Ohio 45244
Enforcement Action Type:	Civil Judicial Action
Facility County:	Hamilton
EPA Region #:	5

Enforcement Action ID:	05-1985-0412
FRS ID:	110001624957
Program ID:	FRS 110001624957
Action Name:	SENCO PRODUCTS, INC.

SENCO PRODUCTS INC PLT NO 1 (Continued) **1011555547**

Facility Name: SENCO PRODUCTS INC
Facility Address: 8485 BROADWELL RD ANDERSON OH 45244
ANDERSON, Ohio 45244
Enforcement Action Type: Civil Judicial Action
Facility County: Hamilton
EPA Region #: 5

Program ID: BR OHD004251070
Facility Name: SENCO PRODUCTS INC
Address: 8485 BROADWELL RD
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3315
Latitude: 39.135222
Longitude: -84.313833

Program ID: BR OHD004251070
Facility Name: SENCO PRODUCTS INC
Address: 8485 BROADWELL RD
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3546
Latitude: 39.135222
Longitude: -84.313833

Program ID: FRS 110001624957
Facility Name: SENCO PRODUCTS INC
Address: 8485 BROADWELL RD
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3315
Latitude: 39.135222
Longitude: -84.313833

Program ID: FRS 110001624957
Facility Name: SENCO PRODUCTS INC
Address: 8485 BROADWELL RD
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3546
Latitude: 39.135222
Longitude: -84.313833

Program ID: OH-CORE 20548
Facility Name: SENCO PRODUCTS INC
Address: 8485 BROADWELL RD
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3315
Latitude: 39.135222
Longitude: -84.313833

SENCO PRODUCTS INC PLT NO 1 (Continued) **1011555547**

Program ID:	OH-CORE 20548
Facility Name:	SENCO PRODUCTS INC
Address:	8485 BROADWELL RD
Tribal Indicator:	N
Fed Facility:	No
NAIC Code:	Not reported
SIC Code:	3546
Latitude:	39.135222
Longitude:	-84.313833

Program ID:	RCRAINFO OHD004251070
Facility Name:	SENCO PRODUCTS INC
Address:	8485 BROADWELL RD
Tribal Indicator:	N
Fed Facility:	No
NAIC Code:	Not reported
SIC Code:	3315
Latitude:	39.135222
Longitude:	-84.313833

Program ID:	RCRAINFO OHD004251070
Facility Name:	SENCO PRODUCTS INC
Address:	8485 BROADWELL RD
Tribal Indicator:	N
Fed Facility:	No
NAIC Code:	Not reported
SIC Code:	3546
Latitude:	39.135222
Longitude:	-84.313833

A4 **ETHICON INCORPORATED** **RCRA NonGen / NLR** **1000247330**
Target **8485 BROADWELL ROAD** **FINDS** **OHD981952385**
Property **CINCINNATI, OH**

Site 4 of 12 in cluster A

Actual:
562 ft.

RCRA NonGen / NLR:

Date form received by agency:	10/29/1986
Facility name:	ETHICON INC
Facility address:	8485 BROADWELL RD SITE B CINCINNATI, OH 45244
EPA ID:	OHD981952385
Mailing address:	500 TECHNE CENTER DR MILFORD, OH 45150
Contact:	ROBERT WARD
Contact address:	500 TECHNE CENTER DR MILFORD, OH 45150
Contact country:	US
Contact telephone:	(513) 388-2067
Contact email:	Not reported
EPA Region:	05
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	JOHNSON AND JOHNSON

ETHICON INCORPORATED (Continued) **1000247330**

Owner/operator address:	ADDRESS NOT REPORTED CITY NOT REPORTED, AK 99998
Owner/operator country:	Not reported
Owner/operator telephone:	(312) 555-1212
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Hazardous Waste Summary:

Waste code:	D001
Waste name:	IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Waste code:	F001
Waste name:	THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLOROETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE, AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Waste code:	U226
Waste name:	ETHANE, 1,1,1-TRICHLORO-
Violation Status:	No violations found

FINDS:

Registry ID: 110002346881

Environmental Interest/Information System
US EPA TRIS (Toxics Release Inventory System) contains information

ETHICON INCORPORATED (Continued) **1000247330**

from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

A5 **SENCO PRODUCTS INC PLANT 1** **RCRA NonGen / NLR** **1000177410**
Target **8485 BROADWELL ROAD** **OHD004251070**
Property **CINCINNATI, OH 45244**

Site 5 of 12 in cluster A

Actual:
562 ft.

RCRA NonGen / NLR:

Date form received by agency:	01/22/2009
Facility name:	SENCO PRODUCTS INC PLANT 1
Facility address:	8485 BROADWELL ROAD CINCINNATI, OH 45244
EPA ID:	OHD004251070
Contact:	ROBERT J SCHMIDT
Contact address:	8485 BROADWELL ROAD CINCINNATI, OH 45244
Contact country:	US
Contact telephone:	(513) 388-2998
Contact email:	BSCHMIDT@SENCO.COM
EPA Region:	05
Land type:	Private
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	ROBERT J SCHMIDT
Owner/operator address:	8485 BROADWELL ROAD CINCINNATI, OH 45244
Owner/operator country:	US
Owner/operator telephone:	(513) 388-2998
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	06/06/1965
Owner/Op end date:	Not reported

Owner/operator name:	SENCO PRODUCTS INC
Owner/operator address:	8485 BROADWELL RD CINCINNATI, OH 45244
Owner/operator country:	Not reported
Owner/operator telephone:	(513) 388-2998
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	SENCO PRODUCTS INC

SENCO PRODUCTS INC PLANT 1 (Continued) **1000177410**

Owner/operator address:	8485 BROADWELL RD CINCINNATI, OH 45244
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	06/06/1965
Owner/Op end date:	Not reported

Owner/operator name:	SENCO PRODUCTS INC
Owner/operator address:	8485 BROADWELL RD CINCINNATI, OH 45244
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	06/06/1965
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	02/27/2006
Facility name:	SENCO PRODUCTS INC PLANT 1
Site name:	SENCO PRODUCTS INC
Classification:	Large Quantity Generator

Date form received by agency:	02/28/2005
Facility name:	SENCO PRODUCTS INC PLANT 1
Site name:	SENCO PRODUCTS INC
Classification:	Large Quantity Generator

Date form received by agency:	02/27/2004
Facility name:	SENCO PRODUCTS INC PLANT 1
Site name:	SENCO PRODUCTS INC
Classification:	Large Quantity Generator

Date form received by agency:	01/25/1993
Facility name:	SENCO PRODUCTS INC PLANT 1
Site name:	SENCO PRODUCTS INC
Classification:	Conditionally Exempt Small Quantity Generator

SENCO PRODUCTS INC PLANT 1 (Continued) **1000177410**

Hazardous Waste Summary:

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

Waste code: D010
Waste name: SELENIUM

Waste code: U181
Waste name: BENZENAMINE, 2-METHYL-5-NITRO-

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

SENCO PRODUCTS INC PLANT 1 (Continued) **1000177410**

Waste code: D010
Waste name: SELENIUM

Waste code: U181
Waste name: BENZENAMINE, 2-METHYL-5-NITRO-

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: F001
Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS USED IN DEGREASING: TETRACHLOROETHYLENE, TRICHLOROETHYLENE, METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, CARBON TETRACHLORIDE, AND CHLORINATED FLUOROCARBONS; ALL SPENT SOLVENT MIXTURES/BLENDS USED IN DEGREASING CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: F002
Waste name: THE FOLLOWING SPENT HALOGENATED SOLVENTS: TETRACHLOROETHYLENE, METHYLENE CHLORIDE, TRICHLOROETHYLENE, 1,1,1-TRICHLOROETHANE, CHLOROBENZENE, 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE, ORTHO-DICHLOROBENZENE, TRICHLOROFLUOROMETHANE, AND 1,1,2-TRICHLOROETHANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE HALOGENATED SOLVENTS OR THOSE LISTED IN F001, F004, OR F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: F003
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

SENCO PRODUCTS INC PLANT 1 (Continued) **1000177410**

Waste code: F005
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

Waste code: U002
Waste name: ACETONE (I)

Waste code: U159
Waste name: 2-BUTANONE (I,T)

Waste code: U210
Waste name: ETHENE, TETRACHLORO-

Waste code: U220
Waste name: BENZENE, METHYL-

Waste code: U239
Waste name: BENZENE, DIMETHYL- (I,T)

Facility Has Received Notices of Violations:

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 01/22/2009
Date achieved compliance: 03/25/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/04/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-52-34(C)(1)(b)
Area of violation: Generators - Pre-transport
Date violation determined: 01/27/1992
Date achieved compliance: 09/03/1992
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/28/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-52-34
Area of violation: Generators - Pre-transport
Date violation determined: 01/27/1992
Date achieved compliance: 05/28/1992

SENCO PRODUCTS INC PLANT 1 (Continued) **1000177410**

Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/13/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-52-34(C)(1)(b)
Area of violation: Generators - Pre-transport
Date violation determined: 01/27/1992
Date achieved compliance: 09/03/1992
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/13/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 01/22/1988
Date achieved compliance: 02/16/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 01/25/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: - 40 CFR 268
Area of violation: LDR - General
Date violation determined: 01/22/1988
Date achieved compliance: 02/08/1989
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 01/22/2009
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Generators - General
Date achieved compliance: 03/25/2009

SENCO PRODUCTS INC PLANT 1 (Continued) **1000177410**

Evaluation lead agency: State

Evaluation date: 02/25/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 10/05/1992
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 01/27/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 05/28/1992
Evaluation lead agency: State

Evaluation date: 01/27/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 09/03/1992
Evaluation lead agency: State

Evaluation date: 01/22/1988
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: LDR - General
Date achieved compliance: 02/08/1989
Evaluation lead agency: State

Evaluation date: 01/22/1988
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 02/16/1988
Evaluation lead agency: State

A6
Target
Property

SENCO PRODUCTS INC
8450 BROADWELL RD
CINCINNATI, OH 45244

Site 6 of 12 in cluster A

CORRACTS
RCRA-LQG
NY MANIFEST
EPA WATCH LIST
US AIRS

1000177413
OHT400012050

Actual:
562 ft.

CORRACTS:

EPA ID: OHT400012050
EPA Region: 05
Area Name: ENTIRE FACILITY
Actual Date: 20060701
Action: CA001
NAICS Code(s): 33261
Spring and Wire Product Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

RCRA-LQG:
Date form received by agency: 02/29/2012

SENCO PRODUCTS INC (Continued) **1000177413**

Facility name:	SENCO PRODUCTS INC
Facility address:	8450 BROADWELL RD CINCINNATI, OH 45244
EPA ID:	OHT400012050
Mailing address:	4270 IVY POINTE BLVD. CINCINNATI, OH 45245
Contact:	ROBERT J SCHMIDT
Contact address:	4270 IVY POINTE BLVD. CINCINNATI, OH 45245
Contact country:	US
Contact telephone:	(513) 388-2998
Contact email:	BSCHMIDT@SENCOBRANDS.COM
EPA Region:	05
Land type:	Private
Classification:	Large Quantity Generator
Description:	Handler: generates 1,000 kg or more of hazardous waste during any calendar month; or generates more than 1 kg of acutely hazardous waste during any calendar month; or generates more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than 100 kg of that material at any time

Owner/Operator Summary:

Owner/operator name:	SENCO BRANDS, INC.
Owner/operator address:	4270 IVY POINTE BLVD. CINCINNATI, OH 45245
Owner/operator country:	US
Owner/operator telephone:	(513) 388-2998
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	07/17/2009
Owner/Op end date:	Not reported

Owner/operator name:	SENCO PRODUCTS, INC.
Owner/operator address:	8484 BROADWELL RD. CINCINNATI, OH 45244
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	06/06/1965
Owner/Op end date:	Not reported

Owner/operator name:	SENCO BRANDS, INC.
Owner/operator address:	8450 BROADWELL RD. CINCINNATI, OH 45244
Owner/operator country:	US
Owner/operator telephone:	(513) 388-2000
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	07/17/2009

SENCO PRODUCTS INC (Continued) **1000177413**

Owner/Op end date: Not reported

Owner/operator name: SENCO PRODUCTS, INC.
Owner/operator address: 8485 BROADWELL RD.
CINCINNATI, OH 45244
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 06/06/1965
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 02/26/2010
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 03/25/2009
Facility name: SENCO PRODUCTS INC
Site name: SENCO PRODUCTS INC PLANT 2
Classification: Small Quantity Generator

Date form received by agency: 02/27/2009
Facility name: SENCO PRODUCTS INC
Classification: Small Quantity Generator

Date form received by agency: 01/22/2009
Facility name: SENCO PRODUCTS INC
Site name: SENCO PRODUCTS INC PLANT 2
Classification: Small Quantity Generator

Date form received by agency: 02/27/2008
Facility name: SENCO PRODUCTS INC
Classification: Small Quantity Generator

Date form received by agency: 06/13/2007
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

SENCO PRODUCTS INC (Continued) **1000177413**

Date form received by agency: 03/06/2006
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 02/28/2005
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 02/27/2004
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 04/08/2003
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 02/25/2003
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 06/19/2002
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 02/23/2000
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 02/27/1998
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 02/22/1996
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 03/01/1994
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 05/05/1993
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Date form received by agency: 04/23/1992
Facility name: SENCO PRODUCTS INC
Classification: Large Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

SENCO PRODUCTS INC (Continued) **1000177413**

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

Biennial Reports:

Last Biennial Reporting Year: 2013

Annual Waste Handled:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Amount (Lbs): 11341.4

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.
Amount (Lbs): 528

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.
Amount (Lbs): 8833.3

Corrective Action Summary:
Event date: 07/01/2006
Event: CA001

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: Universal Waste - Small Quantity Handlers

SENCO PRODUCTS INC (Continued) **1000177413**

Date violation determined: 04/12/2013
Date achieved compliance: 04/12/2013
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/17/2013
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Used Oil - Generators
Date violation determined: 04/12/2013
Date achieved compliance: 08/05/2013
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 05/17/2013
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Container Use and Management
Date violation determined: 03/25/2009
Date achieved compliance: 03/25/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/23/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Universal Waste - Small Quantity Handlers
Date violation determined: 03/25/2009
Date achieved compliance: 06/18/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/23/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Container Use and Management
Date violation determined: 03/25/2009

SENCO PRODUCTS INC (Continued) **1000177413**

Date achieved compliance: 06/18/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/23/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Preparedness and Prevention
Date violation determined: 03/25/2009
Date achieved compliance: 06/18/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/23/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 01/22/2009
Date achieved compliance: 06/18/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/04/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 01/22/2009
Date achieved compliance: 03/25/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/23/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 01/22/2009
Date achieved compliance: 03/25/2009

SENCO PRODUCTS INC (Continued) **1000177413**

Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/23/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Preparedness and Prevention
Date violation determined: 01/22/2009
Date achieved compliance: 06/18/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/23/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 01/22/2009
Date achieved compliance: 03/25/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/04/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 01/22/2009
Date achieved compliance: 03/25/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/04/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 01/22/2009
Date achieved compliance: 03/25/2009
Violation lead agency: State

SENCO PRODUCTS INC (Continued) **1000177413**

Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/04/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Preparedness and Prevention
Date violation determined: 01/22/2009
Date achieved compliance: 06/18/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/04/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 01/22/2009
Date achieved compliance: 06/18/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 04/23/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-52-20(A)
Area of violation: Generators - Manifest
Date violation determined: 02/25/2003
Date achieved compliance: 03/19/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/19/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-35
Area of violation: Generators - Pre-transport
Date violation determined: 02/25/2003
Date achieved compliance: 02/25/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL

SENCO PRODUCTS INC (Continued) **1000177413**

Enforcement action date: 03/19/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-52(D)
Area of violation: Generators - Pre-transport
Date violation determined: 02/25/2003
Date achieved compliance: 06/02/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/19/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-52-34(C)(1)(a) & 66-73(A)
Area of violation: Generators - Pre-transport
Date violation determined: 02/25/2003
Date achieved compliance: 06/02/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/19/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-52(E)
Area of violation: Generators - Pre-transport
Date violation determined: 02/25/2003
Date achieved compliance: 06/02/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/19/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-270-07(A)(2)&(8)
Area of violation: LDR - General
Date violation determined: 02/25/2003
Date achieved compliance: 07/14/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 06/02/2003

SENCO PRODUCTS INC (Continued) **1000177413**

Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-52-34(A)(2)&(3)
Area of violation: Generators - Pre-transport
Date violation determined: 02/25/2003
Date achieved compliance: 02/25/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/19/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-16(C)
Area of violation: Generators - Pre-transport
Date violation determined: 02/25/2003
Date achieved compliance: 06/02/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/19/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-279-22(C)(1)
Area of violation: Used Oil - Definitions
Date violation determined: 02/25/2003
Date achieved compliance: 06/02/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/19/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SS - 3734.02(E)&(F) & 3745-52-34
Area of violation: Generators - General
Date violation determined: 02/25/2003
Date achieved compliance: 03/19/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/19/2003
Enf. disposition status: Not reported

SENCO PRODUCTS INC (Continued) **1000177413**

Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-52-34(C)(1)(b)
Area of violation: Generators - Pre-transport
Date violation determined: 02/25/2003
Date achieved compliance: 06/02/2003
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/19/2003
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-66-73(A)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/19/1997
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-66-74(B)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/19/1997
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-66-74(B)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/27/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported

SENCO PRODUCTS INC (Continued) **1000177413**

Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-16(D)&(E)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/19/1997
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-52(D)&(E)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/19/1997
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-66-73(A)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/27/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-52(D)&(E)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/27/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State

SENCO PRODUCTS INC (Continued) **1000177413**

Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-16(A)&(C)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/19/1997
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-16(D)&(E)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/27/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-52-34(C)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/27/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-16(A)&(C)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/27/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported

SENCO PRODUCTS INC (Continued) **1000177413**

Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-33
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/19/1997
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-35
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 08/19/1997
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/27/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-33
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/27/1996
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-52-34(C)
Area of violation: Generators - Pre-transport
Date violation determined: 06/04/1996
Date achieved compliance: 03/10/1998
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 08/19/1997
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported

SENCO PRODUCTS INC (Continued) **1000177413**

Paid penalty amount: Not reported

Evaluation Action Summary:

Evaluation date:	04/12/2013
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Universal Waste - Small Quantity Handlers
Date achieved compliance:	04/12/2013
Evaluation lead agency:	State
Evaluation date:	04/12/2013
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Used Oil - Generators
Date achieved compliance:	08/05/2013
Evaluation lead agency:	State
Evaluation date:	02/26/2013
Evaluation:	NOT A SIGNIFICANT NON-COMPLIER
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State
Evaluation date:	06/01/2009
Evaluation:	FOLLOW-UP INSPECTION
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State
Evaluation date:	04/17/2009
Evaluation:	SIGNIFICANT NON-COMPLIER
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State
Evaluation date:	03/25/2009
Evaluation:	FOLLOW-UP INSPECTION
Area of violation:	TSD IS-Container Use and Management
Date achieved compliance:	03/25/2009
Evaluation lead agency:	State
Evaluation date:	03/25/2009
Evaluation:	FOLLOW-UP INSPECTION
Area of violation:	State Statute or Regulation
Date achieved compliance:	03/25/2009
Evaluation lead agency:	State
Evaluation date:	03/25/2009
Evaluation:	FOLLOW-UP INSPECTION
Area of violation:	Universal Waste - Small Quantity Handlers
Date achieved compliance:	06/18/2009
Evaluation lead agency:	State
Evaluation date:	03/25/2009
Evaluation:	FOLLOW-UP INSPECTION
Area of violation:	TSD IS-Container Use and Management
Date achieved compliance:	06/18/2009
Evaluation lead agency:	State

SENCO PRODUCTS INC (Continued) **1000177413**

Evaluation date:	03/25/2009
Evaluation:	FOLLOW-UP INSPECTION
Area of violation:	TSD IS-Preparedness and Prevention
Date achieved compliance:	06/18/2009
Evaluation lead agency:	State

Evaluation date:	03/25/2009
Evaluation:	FOLLOW-UP INSPECTION
Area of violation:	Generators - Pre-transport
Date achieved compliance:	06/18/2009
Evaluation lead agency:	State

Evaluation date:	03/25/2009
Evaluation:	FOLLOW-UP INSPECTION
Area of violation:	Generators - General
Date achieved compliance:	03/25/2009
Evaluation lead agency:	State

Evaluation date:	01/22/2009
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Generators - General
Date achieved compliance:	03/25/2009
Evaluation lead agency:	State

Evaluation date:	01/22/2009
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	TSD IS-Preparedness and Prevention
Date achieved compliance:	06/18/2009
Evaluation lead agency:	State

Evaluation date:	01/22/2009
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	State Statute or Regulation
Date achieved compliance:	03/25/2009
Evaluation lead agency:	State

Evaluation date:	01/22/2009
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Generators - Pre-transport
Date achieved compliance:	03/25/2009
Evaluation lead agency:	State

Evaluation date:	01/22/2009
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Generators - Pre-transport
Date achieved compliance:	06/18/2009
Evaluation lead agency:	State

Evaluation date:	02/25/2003
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	LDR - General
Date achieved compliance:	07/14/2003
Evaluation lead agency:	State

Evaluation date:	02/25/2003
Evaluation:	COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation:	Generators - General

SENCO PRODUCTS INC (Continued) **1000177413**

Date achieved compliance: 03/19/2003
Evaluation lead agency: State

Evaluation date: 02/25/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Used Oil - Definitions
Date achieved compliance: 06/02/2003
Evaluation lead agency: State

Evaluation date: 02/25/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 02/25/2003
Evaluation lead agency: State

Evaluation date: 02/25/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Manifest
Date achieved compliance: 03/19/2003
Evaluation lead agency: State

Evaluation date: 02/25/2003
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 06/02/2003
Evaluation lead agency: State

Evaluation date: 08/11/1997
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 03/10/1998
Evaluation lead agency: State

Evaluation date: 06/04/1996
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 03/10/1998
Evaluation lead agency: State

Evaluation date: 06/04/1996
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 08/19/1997
Evaluation lead agency: State

Evaluation date: 01/27/1992
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

NY MANIFEST:
EPA ID: OHT400012050
Country: USA
Mailing Name: SENCO PRODUCTS
Mailing Contact: PAUL TOTH
Mailing Address: 8450 BROADWELL RD
Mailing Address 2: Not reported

SENCO PRODUCTS INC (Continued) **1000177413**

Mailing City:	CINCNNATI
Mailing State:	OH
Mailing Zip:	45244
Mailing Zip4:	Not reported
Mailing Country:	USA
Mailing Phone:	513-388-2503

Document ID:	NYB8846127
Manifest Status:	Not reported
Trans1 State ID:	MOD095038998
Trans2 State ID:	Not reported
Generator Ship Date:	01/14/1999
Trans1 Recv Date:	01/14/1999
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	02/09/1999
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	OHT400012050
Trans1 EPA ID:	NYD049836679
Trans2 EPA ID:	Not reported
TSDF ID:	Not reported
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00165
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	003
Container Type:	DM - Metal drums, barrels
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00055
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	001
Container Type:	DM - Metal drums, barrels
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	99

Document ID:	NYG1044684
Manifest Status:	Not reported
Trans1 State ID:	NYD049253719
Trans2 State ID:	MOD095038998
Generator Ship Date:	06/30/1999
Trans1 Recv Date:	06/30/1999
Trans2 Recv Date:	07/07/1999
TSD Site Recv Date:	07/08/1999
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	OHT400012050
Trans1 EPA ID:	NYD049836679
Trans2 EPA ID:	Not reported
TSDF ID:	Not reported
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	13500
Units:	P - Pounds
Number of Containers:	027

SENCO PRODUCTS INC (Continued) **1000177413**

Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	01.00
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	03530
Units:	P - Pounds
Number of Containers:	005
Container Type:	DM - Metal drums, barrels
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	01.00
Waste Code:	D001 - NON-LISTED IGNITABLE WASTES
Quantity:	02324
Units:	P - Pounds
Number of Containers:	005
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	B Incineration, heat recovery, burning.
Specific Gravity:	01.00
Year:	99

Document ID:	NYG1044702
Manifest Status:	Not reported
Trans1 State ID:	OHD074700311
Trans2 State ID:	MOD095038998
Generator Ship Date:	09/15/1999
Trans1 Recv Date:	09/15/1999
Trans2 Recv Date:	09/24/1999
TSD Site Recv Date:	09/28/1999
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	OHT400012050
Trans1 EPA ID:	NYD049836679
Trans2 EPA ID:	Not reported
TSDF ID:	Not reported
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00495
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	009
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	99

Document ID:	NYG1044765
Manifest Status:	Not reported
Trans1 State ID:	OHD074700311
Trans2 State ID:	MNR000022947
Generator Ship Date:	12/17/1999
Trans1 Recv Date:	12/17/1999
Trans2 Recv Date:	12/20/1999
TSD Site Recv Date:	12/30/1999
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	OHT400012050
Trans1 EPA ID:	NYD049836679
Trans2 EPA ID:	Not reported

SENCO PRODUCTS INC (Continued) **1000177413**

TSDF ID:	Not reported
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00385
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	007
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	99

Document ID:	NYG1697292
Manifest Status:	Not reported
Trans1 State ID:	MNR000022947
Trans2 State ID:	Not reported
Generator Ship Date:	09/19/2000
Trans1 Recv Date:	09/19/2000
Trans2 Recv Date:	Not reported
TSD Site Recv Date:	10/23/2000
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	OHT400012050
Trans1 EPA ID:	NYD049836679
Trans2 EPA ID:	Not reported
TSDF ID:	Not reported
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00495
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	009
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	2000

Document ID:	NYG1698066
Manifest Status:	Not reported
Trans1 State ID:	OHD074700311
Trans2 State ID:	MOD095038998
Generator Ship Date:	03/21/2000
Trans1 Recv Date:	03/21/2000
Trans2 Recv Date:	03/22/2000
TSD Site Recv Date:	04/19/2000
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	OHT400012050
Trans1 EPA ID:	NYD049836679
Trans2 EPA ID:	Not reported
TSDF ID:	Not reported
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00330
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	006
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	2000

SENCO PRODUCTS INC (Continued) **1000177413**

Document ID:	NYG0633303
Manifest Status:	Not reported
Trans1 State ID:	OHD074700311
Trans2 State ID:	OKD981588791
Generator Ship Date:	05/30/2000
Trans1 Recv Date:	05/30/2000
Trans2 Recv Date:	06/06/2000
TSD Site Recv Date:	06/08/2000
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	OHT400012050
Trans1 EPA ID:	NYD049836679
Trans2 EPA ID:	Not reported
TSDF ID:	Not reported
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00330
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	006
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	2000

Document ID:	NYG1697391
Manifest Status:	Not reported
Trans1 State ID:	OHD074700311
Trans2 State ID:	NYD982792814
Generator Ship Date:	02/26/2001
Trans1 Recv Date:	02/26/2001
Trans2 Recv Date:	02/27/2001
TSD Site Recv Date:	03/01/2001
Part A Recv Date:	Not reported
Part B Recv Date:	Not reported
Generator EPA ID:	OHT400012050
Trans1 EPA ID:	NYD049836679
Trans2 EPA ID:	Not reported
TSDF ID:	Not reported
Waste Code:	D002 - NON-LISTED CORROSIVE WASTES
Quantity:	00385
Units:	G - Gallons (liquids only)* (8.3 pounds)
Number of Containers:	007
Container Type:	DF - Fiberboard or plastic drums (glass)
Handling Method:	T Chemical, physical, or biological treatment.
Specific Gravity:	01.00
Year:	2001

EPA WATCH LIST:

Facility ID:	OHT400012050
Program:	RCRA Facilities
List date:	April 2012 Watch List

Facility ID:	OHT400012050
Program:	RCRA Facilities
List date:	July 2012 Watch List

Facility ID:	OHT400012050

SENCO PRODUCTS INC (Continued) **1000177413**

Program: RCRA Facilities
List date: June 2012 Watch List

Facility ID: OHT400012050
Program: RCRA Facilities
List date: May 2012 Watch List

Facility ID: OHT400012050
Program: RCRA Facilities
List date: September 2012 Watch List

Facility ID: OHT400012050
Program: RCRA Facilities
List date: November 2012 Watch List

Facility ID: OHT400012050
Program: RCRA Facilities
List date: August 2012 Watch List

Facility ID: OHT400012050
Program: RCRA Facilities
List date: December 2012 Watch List

Facility ID: OHT400012050
Program: RCRA Facilities
List date: October 2012 Watch List

AIRS (AFS):

Compliance and Violation Data Major Sources:
EPA plant ID: 110000393887
Plant name: SENCO PRODUCTS INC.
Plant address: 8450 BROADWELL RD.
CINCINNATI, OH 452441611
County: HAMILTON
Region code: 05
Dunn & Bradst #: 004251070
Air quality cntrl region: 079
Sic code: 3495
Sic code desc: WIRE SPRINGS
North Am. industrial classf: 332612
NAIC code description: Spring (Light Gauge) Manufacturing
Default compliance status: Not reported
Default classification: ACTUAL OR POTENTIAL EMISSIONS ARE ABOVE THE APPLICABLE MAJOR SOURCE THRESHOLDS
Govt facility: ALL OTHER FACILITIES NOT OWNED OR OPERATED BY A FEDERAL, STATE, OR LOCAL GOVERNMENT
Current HPV: Not reported

Compliance and Enforcement Major Issues:
Air program: SIP SOURCE
National action type: MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved: 000215
Penalty amount: 000000000

Air program: SIP SOURCE

SENCO PRODUCTS INC (Continued) **1000177413**

National action type: ST SOURCE TEST CONDUCTED
Date achieved: 000808
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 030318
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 030318
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 030318
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 030318
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 030318
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: NXXXXX
Date achieved: 030430
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: NXXXXX
Date achieved: 030430
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: FINAL COMPLIANCE
Date achieved: 030508
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: FINAL COMPLIANCE
Date achieved: 030508
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved: 030509
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 030518

SENCO PRODUCTS INC (Continued) **1000177413**

Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 030518
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE DAY 0
Date achieved: 030604
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE DAY 0
Date achieved: 030604
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: EPA CONDUCTED PCE/ ON-SITE
Date achieved: 030624
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: EPA CONDUCTED PCE/ ON-SITE
Date achieved: 030624
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: EPA CONDUCTED FCE / ON-SITE
Date achieved: 030624
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: EPA CONDUCTED FCE / ON-SITE
Date achieved: 030624
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE REPORTED AS ADDED
Date achieved: 030728
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE REPORTED AS ADDED
Date achieved: 030728
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 030729
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: SV RESOLVED
Date achieved: 030729
Penalty amount: 000000000

SENCO PRODUCTS INC (Continued) **1000177413**

Air program:	TITLE V PERMITS
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	030729
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	SV RESOLVED
Date achieved:	030729
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	030729
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	030729
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	030729
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION EPA REVIEW
Date achieved:	040218
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	040309
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	040309
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	040309
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	040309
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	040309
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	TITLE V COMPLIANCE CERT DUE/RECEIVED BY

SENCO PRODUCTS INC (Continued) **1000177413**

Date achieved: 040505
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 040524
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 040524
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: FINAL COMPLIANCE
Date achieved: 040629
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: FINAL COMPLIANCE
Date achieved: 040629
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: NXXXXX
Date achieved: 040708
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: NXXXXX
Date achieved: 040708
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE REPORTED AS ADDED
Date achieved: 040730
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE REPORTED AS ADDED
Date achieved: 040730
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE DAY 0
Date achieved: 040822
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE DAY 0
Date achieved: 040822
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: SV RESOLVED
Date achieved: 040829
Penalty amount: 000000000

SENCO PRODUCTS INC (Continued) **1000177413**

Air program: MACT (SECTION 63 NESHAPS)
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 040829
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 040829
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: SV RESOLVED
Date achieved: 040829
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 040829
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 040829
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 040829
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 040829
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 050902
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 050902
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE CONDUCTED FCE / OFF-SITE
Date achieved: 051214
Penalty amount: Not reported

Air program: MACT (SECTION 63 NESHAPS)
National action type: STATE CONDUCTED FCE / OFF-SITE
Date achieved: 051214
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / OFF-SITE

SENCO PRODUCTS INC (Continued) **1000177413**

Date achieved: 051214
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 060118
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: FINAL COMPLIANCE
Date achieved: 060118
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 060118
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: FINAL COMPLIANCE
Date achieved: 060118
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 060118
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: FINAL COMPLIANCE
Date achieved: 060118
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: FINAL COMPLIANCE
Date achieved: 060119
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 060119
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 060119
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: FINAL COMPLIANCE
Date achieved: 060119
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 060119
Penalty amount: 000000000

SENCO PRODUCTS INC (Continued) **1000177413**

Air program: TITLE V PERMITS
National action type: FINAL COMPLIANCE
Date achieved: 060119
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 060410
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 060410
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 060410
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 060517
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 060517
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 060517
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 070122
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 070122
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 070122
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 070122
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY

SENCO PRODUCTS INC (Continued) **1000177413**

Date achieved:	070427
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	070427
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	070430
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	070430
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	080313
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	080313
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	080430
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	080430
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	080505
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	080505
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	080905
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	080905
Penalty amount:	Not reported

SENCO PRODUCTS INC (Continued) **1000177413**

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 090202
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 090202
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 090414
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 090414
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 100301
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 100301
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 100510
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 100510
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 100524
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 100524
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 110426
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY

SENCO PRODUCTS INC (Continued) **1000177413**

Date achieved:	110426
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	110509
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	110509
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	120424
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	120424
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	120509
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	120509
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	120619
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	120619
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	130724
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	130806
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved:	970212
Penalty amount:	000000000

SENCO PRODUCTS INC (Continued) **1000177413**

Air program: SIP SOURCE
National action type: EPA INSPECTION - LEVEL 2 OR GREATER
Date achieved: 981105
Penalty amount: 000000000

Historical Compliance Minor Sources:

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1004
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1101
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1104
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1204
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1303
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: Not reported
Hist compliance date: 1103
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1201
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1202
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1204
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1302
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1303
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1004
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1004
Air prog code hist file: TITLE V PERMITS

SENCO PRODUCTS INC (Continued) **1000177413**

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1101
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1101
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1102
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1103
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1201
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1202
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1203
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1301
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1302
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: Not reported
Hist compliance date: 1102
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1102
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1103
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1104
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1104
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported

SENCO PRODUCTS INC (Continued) **1000177413**

Hist compliance date: 1201
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1202
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1203
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1203
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1204
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1301
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1301
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1302
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1303
Air prog code hist file: SIP SOURCE

A7 **8485 BROADWELL ROAD** **OH SPILLS** **S106314549**
Target **8485 BROADWELL RD** **OH NPDES** **N/A**
Property **CINCINNATI, OH 45244**

Site 7 of 12 in cluster A

Actual:
562 ft.

SPILLS:
Spill No.: 0403-31-0863
Spill Year: 2004
Date Spill Reported: 03/04/2004
Spill Month: 3
Spill Number: 0863
Reporter Name: DAVID LEVERAGE
Confidential: No
District Code: SW
Employee Number: Not reported
Lat/Long: Not reported
Product Spilled Name: WASTE WATER

Spill No.: 0410-31-4591
Spill Year: 2004
Date Spill Reported: 10/29/2004

8485 BROADWELL ROAD (Continued) **S106314549**

Spill Month: 10
Spill Number: 4591
Reporter Name: ANDREW GRINER
Confidential: No
District Code: SW
Employee Number: Not reported
Lat/Long: Not reported
Product Spilled Name: WASTE WATER

Spill No.: 0510-31-4332
Spill Year: 2005
Date Spill Reported: 10/31/2005
Spill Month: 10
Spill Number: 4332
Reporter Name: ANDREW GRINER
Confidential: No
District Code: SW
Employee Number: Not reported
Lat/Long: Not reported
Product Spilled Name: WASTE WATER

OH NPDES:
Issue Date: 12/17/2010
Township: Not reported
Facility Npdes Permit: 1GC03821*AG
Applicant Name: BRL DEVELOPMENT CO LLC
Applicant Address: 3700 ROUND BOTTOM RD CINCINNATI, OH 45244

A8 **SENCO PRODUCTS** **OH SPILLS** **S106334913**
Target **100 YDS BEHIND FACTORY-8485 BROADWELL RD** **N/A**
Property **CINCINNATI, OH**

Site 8 of 12 in cluster A

Actual:
562 ft.

SPILLS:
Spill No.: 8906-31-2246
Spill Year: 1989
Date Spill Reported: 06/20/1989
Spill Month: 6
Spill Number: 2246
Reporter Name: CITIZEN
Confidential: No
District Code: SW
Employee Number: Not reported
Lat/Long: Not reported
Product Spilled Name: MATERIAL GREEN
Product Spilled Name: MATERIAL UNKNOWN

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

A9 **Target** **Property**	**SENCO PRODUCTS INC.** **8450 BROADWELL RD.** **CINCINNATI, OH 45244**	**OH SPILLS** **OH AIRS**	**S106335398** **N/A**

Site 9 of 12 in cluster A

Actual:
562 ft.

SPILLS:

Spill No.:	8812-31-4176
Spill Year:	1988
Date Spill Reported:	12/20/1988
Spill Month:	12
Spill Number:	4176
Reporter Name:	COMPANY
Confidential:	No
District Code:	SW
Employee Number:	Not reported
Lat/Long:	Not reported
Product Spilled Name:	XYLENE

AIRS:

Facility Id:	1431340977
Permit Classification:	A
# Emission Units Meeting Def of Trivial Outlined in EngGuide62:	0
Insignificant Emission Units:	197
Significant Emission Units:	145
Contact First Name:	Clifford
Contact Last Name:	Mentrup
Mailing Address 1:	4270 Ivy Pointe Boulevard
Mailing Address 2:	Not reported
Mailing City/State/Zip:	CINCINNATI, OH 45208
Contact Phone:	5133882523
Contact EMail:	cmentrup@sencobrands.com

A10 **< 1/8** **1 ft.**	**INTERPAVE CORPORATION** **8479 BROADWELL RD** **CINCINNATI, OH**	**OH RGA LUST**	**S114770139** **N/A**

Site 10 of 12 in cluster A

Relative:
Higher

Actual:
562 ft.

RGA LUST:

2012	INTERPAVE CORPORATION	8479 BROADWELL RD
2011	INTERPAVE CORPORATION	8479 BROADWELL RD
2010	INTERPAVE CORPORATION	8479 BROADWELL RD
2009	INTERPAVE CORPORATION	8479 BROADWELL RD
2008	INTERPAVE CORPORATION	8479 BROADWELL RD
2007	INTERPAVE CORPORATION	8479 BROADWELL RD
2006	INTERPAVE CORPORATION	8479 BROADWELL RD
2005	INTERPAVE CORPORATION	8479 BROADWELL RD
2004	INTERPAVE CORPORATION	8479 BROADWELL RD
2003	INTERPAVE CORPORATION	8479 BROADWELL RD
2002	INTERPAVE CORPORATION	8479 BROADWELL RD
2001	INTERPAVE CORPORATION	8479 BROADWELL RD
2000	INTERPAVE CORPORATION	8479 BROADWELL RD

A11 **INTERPAVE CORPORATION** **OH LUST** **U004206756**
8479 BROADWELL RD **OH UST** **N/A**
< 1/8 **CINCINNATI, OH 45244**
1 ft.

Site 11 of 12 in cluster A

Relative:
Higher

Actual:
562 ft.

LUST:

Release Number:	31002266-N00001
Release Date:	Not reported
Facility Status:	**Inactive**
LTF Status:	6 Closure of regulated UST
FR Status:	**NFA: No Further Action**
Priority:	3
Review Date:	06/20/2000
Class:	Viable Responsible Party has been identified

UST:

Facility Id:	31002266
Facility Type:	Unknown
Owner Name:	Not reported
Owner Address:	Not reported
Owner City/State/Zip:	Not reported

Tank Number:	T00001
Status:	REM - Removed
UST Capacity:	4000
Tank Content:	Gasoline
Installation Date:	Not reported
Construction:	Other
Date Last Used:	01/01/1981
Date TCL Closed:	Not reported
Date Removed:	04/20/1995
CAS Number:	8006-61-9
Abandoned Approved:	Not reported
Regulated:	YES
Sensitive Area:	NO
Date Of Sensitivity:	Not reported
UST Configurations:	Not reported
Construction Comments:	Other
Corrosion Protections:	Not reported
Corrosion Protection Comments:	Not reported
Primary Release Detection:	AMO - Alternative Method (Other, explain)
Secondary Release Detection:	Not reported
Release Detection Comments:	RDTank: / RDLine:
Piping Configuration:	Not reported
Piping Configuration Comments:	Not reported
Piping Styles:	NA - Not Applicable
Piping Constructions:	OTH - Other (explain)
Piping Construction Comments:	Unknown
Piping Corrosion Protections:	OTH - Other (explain)
Piping Corrosion Protection Comments:	Not reported
Piping Release Detections:	OTH - Other(explain)
Piping Release Detection Comments:	Not reported
Spill Prevention Manholes:	NP - None Present
Spill Prevention Manhole Comments:	No
OverFill Prevention:	Not reported
OverFill Prevention Comment:	OverFill Spill: No
Comments:	Not reported

A12	**INTERPAVE CORP**	**OH RGA LUST**	**S114770138**
	8479 BROADWELL RD		**N/A**
< 1/8	**CINCINNATI, OH**		
1 ft.			

Site 12 of 12 in cluster A

Relative: **Higher**

Actual: **562 ft.**

RGA LUST:

1999	INTERPAVE CORP	8479 BROADWELL RD
1998	INTERPAVE CORP	8479 BROADWELL RD
1997	INTERPAVE CORP	8479 BROADWELL RD
1996	INTERPAVE CORP	8479 BROADWELL RD
1995	INTERPAVE CORP	8479 BROADWELL RD

13	**TRI-STAR REFRACTORIES**	**RCRA-CESQG**	**1000211618**
WNW	**8361 BROADWELL RD**	**FINDS**	**OHD093902542**
< 1/8	**CINCINNATI, OH 45244**		
0.013 mi.			
68 ft.			

Relative: **Lower**

Actual: **540 ft.**

RCRA-CESQG:

Date form received by agency:	02/25/2004
Facility name:	TRI-STAR REFRACTORIES
Facility address:	8361 BROADWELL RD CINCINNATI, OH 45244
EPA ID:	OHD093902542
Mailing address:	400 FAIRWAY DR CORAOPLIS, PA 15108
Contact:	RHONDA VETE
Contact address:	Not reported Not reported
Contact country:	Not reported
Contact telephone:	(412) 675-6848
Contact email:	rvete@anhrefractories.com
EPA Region:	05
Land type:	Private
Classification:	Conditionally Exempt Small Quantity Generator
Description:	Handler: generates 100 kg or less of hazardous waste per calendar month, and accumulates 1000 kg or less of hazardous waste at any time; or generates 1 kg or less of acutely hazardous waste per calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates at any time: 1 kg or less of acutely hazardous waste; or 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste

Owner/Operator Summary:

Owner/operator name:	DIDER TAYLOR
Owner/operator address:	ADDRESS NOT REPORTED CITY NOT REPORTED, AK 99998
Owner/operator country:	US
Owner/operator telephone:	(312) 555-1212
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	01/01/0001

TRI-STAR REFRACTORIES (Continued) **1000211618**

Owner/Op end date: 09/24/1991

Owner/operator name: NORTH AMERICAN REFRACTORIES
Owner/operator address: 400 FAIRWAY DR
CORAOPOLIS, PA 15108
Owner/operator country: US
Owner/operator telephone: (412) 375-6848
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 09/24/1991
Owner/Op end date: Not reported

Owner/operator name: NORTH AMERICAN REFRACTORIES
Owner/operator address: 400 FAIRWAY DR
CORAOPOLIS, PA 15108
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 09/24/1991
Owner/Op end date: Not reported

Owner/operator name: NORTH AMERICAN REFRACTORIES
Owner/operator address: 400 FAIRWAY DR
CORAOPOLIS, PA 15108
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 09/24/1991
Owner/Op end date: Not reported

Owner/operator name: NAME NOT REPORTED
Owner/operator address: ADDRESS NOT REPORTED
CITY NOT REPORTED, AK 99998
Owner/operator country: Not reported
Owner/operator telephone: (312) 555-1212
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 01/01/0001
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No

TRI-STAR REFRACTORIES (Continued) **1000211618**

Used oil transporter: No

Historical Generators:
Date form received by agency: 02/22/2000
Facility name: TRI-STAR REFRACTORIES
Site name: NORTH AMERICAN REFRACTORIES TRI-STAR PLT
Classification: Conditionally Exempt Small Quantity Generator

Date form received by agency: 11/18/1980
Facility name: TRI-STAR REFRACTORIES
Site name: DIDER TAYLOR
Classification: Not a generator, verified

Hazardous Waste Summary:
Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

Waste code: U188
Waste name: PHENOL

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

Waste code: U188
Waste name: PHENOL

Violation Status: No violations found

Evaluation Action Summary:
Evaluation date: 10/28/2003

TRI-STAR REFRACTORIES (Continued) **1000211618**

Evaluation:	FOCUSED COMPLIANCE INSPECTION
Area of violation:	Not reported
Date achieved compliance:	Not reported
Evaluation lead agency:	State

FINDS:

Registry ID: 110009430428

Environmental Interest/Information System

NCDB (National Compliance Data Base) supports implementation of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA). The system tracks inspections in regions and states with cooperative agreements, enforcement actions, and settlements.

US EPA TRIS (Toxics Release Inventory System) contains information from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZARDOUS WASTE BIENNIAL REPORTER

The OH-CORE (Ohio - Core) database contains information commonly shared among the Ohio EPA environmental programs. The information is facility-based, general in nature, and used to support specific programmatic systems while simultaneously maintaining an inventory of common facility-related data. Specific programmatic details are maintained in programmatic databases.

US EPA RACT/BACT/LAER Clearinghouse (RBLC) database contains case-specific information on the "Best Available" air pollution technologies that have been required to reduce the emission of air pollutants from stationary sources (e.g., power plants, steel mills, chemical plants, etc.). RACT, or Reasonably Available Control Technology, is required on existing sources in areas that are not meeting national ambient air quality standards. BACT, or Best Available Control Technology, is required on major new or modified sources in clean areas. LAER, or Lowest Achievable Emission Rate, is required on major new or modified sources in non-attainment areas.

14
SW
< 1/8
0.036 mi.
192 ft.

INTERPAVE CORPORATION
8479 BROADWELL RD
CINCINNATI, OH 45244

OH ARCHIVE UST **U004093505**
N/A

Relative:
Lower

Actual:
560 ft.

ARCHIVE UST:
Facility Number: 31002266

Permit:
Facility Id: 31002266
Permit Id: P00001
Permit Status: Expired
Issued Date: 5/2/1995
Lfd Permit Id: Not reported

Inspection:
Facility Id: 31002266
Code: 103
Permit Number: P00001
Inspection Type: Final

Tanks:
Tank ID: T00001
Tank Status: **Removed**
Tank Type: Other
Capacity: 4000
Content: Gasoline
CAS #: 8006-61-9
Regulated: Yes
Overfill Device Installed: No
Spill Device Installed: No
Installation Date: Not reported
Date Removed: 4/20/1995
Date Last Used: 1/1/1981
Date Abandoned/Closed: Not reported
Corrosion Protection Tank: Not reported
Release Detection on Tank: Not reported
Corrosion Protection Piping: Not reported
Piping Material: Unknown
Piping Type: Not reported
Release Detection on Piping: Not reported

B15
WNW
< 1/8
0.091 mi.
483 ft.

ANDERSON TOWNSHIP LANDFILL
8311 BROADWELL RD
CINCINNATI, OH 45244

OH SWF/LF **S111749929**
N/A

Site 1 of 3 in cluster B

Relative:
Lower

Actual:
538 ft.

LF:
Facility Address: Not reported
Facility ID: Not reported
Status: Not reported
Facility Phone: Not reported
Last Update: Not reported
SWMD: Not reported
Type: Not reported
Closed Facility: Not reported

ANDERSON TOWNSHIP LANDFILL (Continued) **S111749929**

Class: Not reported
Captive: Not reported
Docket #: Closed-MSW
Core Place ID: 134426
Start Date: Not reported
End Date: Not reported
District Office: SWDO
Phone Number: Not reported
Organization ID: Not reported
Org. Comments: Not reported
Contact Name: Not reported
Contact Phone: Not reported
Issue Date: Not reported
Expire Date: Not reported
Report ID: Not reported
Registration #: Not reported
Operator: Not reported
Operator Address: Not reported
Operator City,St,Zip: Not reported
Operator Phone: Not reported
Licence Holder: Not reported
Licence Holder Address: Not reported
Licence Holder City,St,Zip: Not reported
Licence Holder Phone: Not reported
Owner Name: Not reported
Owner Address: Not reported
Owner City,St,Zip: Not reported
Owner Phone: Not reported
Applicant Name: Not reported
Applicant Address: Not reported

B16	**ANDERSON TOWNSHIP LANDFILL**	**OH HIST LF**	**S105859829**
WNW	**8311 BROADWELL ROAD**		**N/A**
< 1/8	**ANDERSON TWP., OH**		
0.091 mi.			
483 ft.	**Site 2 of 3 in cluster B**		

Relative:
Lower

Actual:
538 ft.

LF_HIST:
Year closed: 1986
Publicly owned: Yes
Location: SOUTH OF JUNCTION OF BROADWELL & ROUNDBOTTOM ROADS.
Lat/Long: 39 08 16 84 19 17
Waste Type: GENERAL
Capacity: 22AC50FT
SWF ID: 310003
Owner Name: ANDERSON TOWNSHIP LANDFILL, INC.
Owner Address: 10777 HUGHES ROAD
Owner City,St,Zip: CINCINNATI 45247
Ohio ID: N
District: 5

B17 **WNW** **< 1/8** **0.091 mi.** **483 ft.**	**ANDERSON TOWNSHIP LANDFILL** **8311 BROADWELL RD** **CINCINNATI, OH** **Site 3 of 3 in cluster B**	**OH RGA LF**	**S114800962** **N/A**

Relative:
Lower

Actual:
538 ft.

RGA LF:

2012	ANDERSON TOWNSHIP LANDFILL	8311 BROADWELL RD

C18 **WNW** **1/4-1/2** **0.308 mi.** **1626 ft.**	**B-WAY CORPORATION** **8200 BROADWELL ROAD** **CINCINNATI, OH 45244** **Site 1 of 3 in cluster C**	**RCRA-TSDF** **CERC-NFRAP** **CORRACTS** **RCRA-SQG** **OH DERR** **OH SPILLS** **OH AIRS** **2020 COR ACTION** **US AIRS**	**1000270538** **OHD004253225**

Relative:
Lower

Actual:
537 ft.

RCRA-TSDF:

Date form received by agency:	11/06/2008
Facility name:	BWAY PACKAGING
Facility address:	8200 BROADWELL ROAD CINCINNATI, OH 45244
EPA ID:	OHD004253225
Contact:	JANINE LOYER
Contact address:	8200 BROADWELL RD CINCINNATI, OH 45244
Contact country:	US
Contact telephone:	(513) 388-2220
Contact email:	JANINE.LOYER@BYWAYCORP.COM
EPA Region:	05
Land type:	Private
Classification:	TSDF
Description:	Handler is engaged in the treatment, storage or disposal of hazardous waste

Owner/Operator Summary:

Owner/operator name:	BWAY MANUFACTURING INC
Owner/operator address:	8200 BROADWELL RD CINCINNATI, OH 45244
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	09/01/1996
Owner/Op end date:	Not reported
Owner/operator name:	BWAY CORPORATION
Owner/operator address:	8607 ROBERTS DR ATLANTA, GA 00350
Owner/operator country:	US
Owner/operator telephone:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	09/01/1996
Owner/Op end date:	Not reported

B-WAY CORPORATION (Continued) **1000270538**

Owner/operator name: CRICBW ANDERSON TRUST
Owner/operator address: 8607 ROBERTS DR
ATLANTA, GA 30350
Owner/operator country: US
Owner/operator telephone: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 09/10/1999
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 05/09/2006
Facility name: BWAY PACKAGING
Classification: Small Quantity Generator

Date form received by agency: 02/27/2006
Facility name: BWAY PACKAGING
Classification: Large Quantity Generator

Date form received by agency: 02/28/2005
Facility name: BWAY PACKAGING
Site name: BWAY MANUFACTURING
Classification: Large Quantity Generator

Date form received by agency: 02/25/2004
Facility name: BWAY PACKAGING
Site name: BWAY MANUFACTURING INC
Classification: Large Quantity Generator

Date form received by agency: 02/28/2003
Facility name: BWAY PACKAGING
Site name: BWAY MANUFACTURING INC.
Classification: Large Quantity Generator

Date form received by agency: 12/16/2002
Facility name: BWAY PACKAGING
Site name: BWAY MANUFACTURING INC
Classification: Large Quantity Generator

B-WAY CORPORATION (Continued) **1000270538**

Date form received by agency: 05/28/2002
Facility name: BWAY PACKAGING
Site name: BWAY MANUFACTURING INC
Classification: Large Quantity Generator

Date form received by agency: 02/28/2000
Facility name: BWAY PACKAGING
Site name: MILTON CAN COMPANY
Classification: Large Quantity Generator

Date form received by agency: 02/24/1998
Facility name: BWAY PACKAGING
Site name: MILTON CAN COMPANY
Classification: Large Quantity Generator

Date form received by agency: 10/28/1996
Facility name: BWAY PACKAGING
Site name: MILTON CAN CO INC
Classification: Large Quantity Generator

Date form received by agency: 02/23/1996
Facility name: BWAY PACKAGING
Site name: BALL METAL FOOD CONTAINER CORPORATION
Classification: Large Quantity Generator

Date form received by agency: 09/10/1994
Facility name: BWAY PACKAGING
Site name: HEEKIN CAN INC DBA BALL CORPORATION
Classification: Large Quantity Generator

Date form received by agency: 02/26/1992
Facility name: BWAY PACKAGING
Site name: HEEKIN CAN INC
Classification: Large Quantity Generator

Date form received by agency: 02/23/1990
Facility name: BWAY PACKAGING
Site name: HEEKIN CAN INC
Classification: Large Quantity Generator

Date form received by agency: 11/17/1980
Facility name: BWAY PACKAGING
Site name: MILTON CAN CO INC
Classification: Not a generator, verified

Date form received by agency: 01/01/1979
Facility name: BWAY PACKAGING
Site name: MILTON CAN CO INC
Classification: Large Quantity Generator

Hazardous Waste Summary:
Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE

B-WAY CORPORATION (Continued) **1000270538**

MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

Waste code: D035
Waste name: METHYL ETHYL KETONE

Corrective Action Summary:
Event date: 09/29/1989
Event: RFA Completed

Event date: 09/29/1989
Event: RFA Determination Of Need For An RFI, RFI is Necessary;

Event date: 09/27/1991
Event: CA Prioritization, Facility or area was assigned a medium corrective action priority.

Event date: 03/31/1994
Event: CA Prioritization, Facility or area was assigned a medium corrective action priority.

Event date: 07/01/2006
Event: CA002IL

Event date: 09/13/2007
Event: RFI Imposition

Facility Has Received Notices of Violations:
Regulation violated: SR - 3745-65-52(A),-53(B)
Area of violation: Generators - Pre-transport
Date violation determined: 10/28/1991
Date achieved compliance: 11/29/1991
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 10/28/1991
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: SR - 3745-65-52(A),-53(B)
Area of violation: Generators - Pre-transport
Date violation determined: 10/28/1991
Date achieved compliance: 11/29/1991
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 10/21/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: 25000
Final penalty amount: Not reported
Paid penalty amount: Not reported

B-WAY CORPORATION (Continued) **1000270538**

Regulation violated:	Not reported
Area of violation:	Generators - General
Date violation determined:	07/31/1990
Date achieved compliance:	10/28/1991
Violation lead agency:	State
Enforcement action:	WRITTEN INFORMAL
Enforcement action date:	08/06/1990
Enf. disposition status:	Not reported
Enf. disp. status date:	Not reported
Enforcement lead agency:	State
Proposed penalty amount:	Not reported
Final penalty amount:	Not reported
Paid penalty amount:	Not reported

Regulation violated:	Not reported
Area of violation:	Generators - General
Date violation determined:	07/31/1990
Date achieved compliance:	10/28/1991
Violation lead agency:	State
Enforcement action:	WRITTEN INFORMAL
Enforcement action date:	09/14/1990
Enf. disposition status:	Not reported
Enf. disp. status date:	Not reported
Enforcement lead agency:	State
Proposed penalty amount:	Not reported
Final penalty amount:	Not reported
Paid penalty amount:	Not reported

Regulation violated:	Not reported
Area of violation:	Generators - General
Date violation determined:	07/31/1990
Date achieved compliance:	10/28/1991
Violation lead agency:	State
Enforcement action:	FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date:	10/21/1992
Enf. disposition status:	Not reported
Enf. disp. status date:	Not reported
Enforcement lead agency:	State
Proposed penalty amount:	25000
Final penalty amount:	Not reported
Paid penalty amount:	Not reported

Regulation violated:	Not reported
Area of violation:	Generators - General
Date violation determined:	09/16/1988
Date achieved compliance:	10/12/1988
Violation lead agency:	State
Enforcement action:	WRITTEN INFORMAL
Enforcement action date:	09/19/1988
Enf. disposition status:	Not reported
Enf. disp. status date:	Not reported
Enforcement lead agency:	State
Proposed penalty amount:	Not reported
Final penalty amount:	Not reported
Paid penalty amount:	Not reported

Regulation violated:	Not reported

B-WAY CORPORATION (Continued) **1000270538**

Area of violation: Generators - General
Date violation determined: 09/16/1988
Date achieved compliance: 10/12/1988
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 10/21/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: 25000
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/16/1988
Date achieved compliance: 10/12/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 06/20/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/16/1988
Date achieved compliance: 10/12/1988
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 10/21/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: 25000
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 07/24/1986
Date achieved compliance: 10/22/1986
Violation lead agency: State
Enforcement action: FINAL 3008(A) COMPLIANCE ORDER
Enforcement action date: 10/21/1992
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: 25000
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General

B-WAY CORPORATION (Continued) **1000270538**

Date violation determined: 07/24/1986
Date achieved compliance: 10/22/1986
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/24/1986
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 11/06/2008
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 05/09/2006
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 11/21/2002
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: EPA

Evaluation date: 11/21/2002
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/18/1997
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 10/17/1991
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Generators - Pre-transport
Date achieved compliance: 11/29/1991
Evaluation lead agency: State

Evaluation date: 07/31/1990
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 10/28/1991
Evaluation lead agency: State

Evaluation date: 07/31/1990
Evaluation: FOCUSED COMPLIANCE INSPECTION

B-WAY CORPORATION (Continued) **1000270538**

Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 10/30/1989
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 01/06/1989
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/16/1988
Evaluation: FOCUSED COMPLIANCE INSPECTION
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/16/1988
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 10/12/1988
Evaluation lead agency: State

Evaluation date: 06/16/1988
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 10/12/1988
Evaluation lead agency: State

Evaluation date: 02/20/1987
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/24/1986
Evaluation: NON-FINANCIAL RECORD REVIEW
Area of violation: Generators - General
Date achieved compliance: 10/22/1986
Evaluation lead agency: State

Evaluation date: 04/15/1986
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/06/1986
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

B-WAY CORPORATION (Continued) **1000270538**

Evaluation date: 05/14/1985
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

CERC-NFRAP:
Site ID: 0504188
Federal Facility: Not a Federal Facility
NPL Status: Not on the NPL
Non NPL Status: Deferred to RCRA

Program Priority:
Description: RCRA Deferral Audit

Description: RCRA Deferral - Lead Confirmed

CERCLIS-NFRAP Assessment History:
Action: SITE INSPECTION
Date Started: / /
Date Completed: 11/09/92
Priority Level: Deferred to RCRA (Subtitle C)

Action: ARCHIVE SITE
Date Started: / /
Date Completed: 12/27/95
Priority Level: Not reported

Action: DISCOVERY
Date Started: / /
Date Completed: 10/27/86
Priority Level: Not reported

Action: PRELIMINARY ASSESSMENT
Date Started: / /
Date Completed: 10/27/87
Priority Level: Low priority for further assessment

CORRACTS:

EPA ID: OHD004253225
EPA Region: 05
Area Name: ENTIRE FACILITY
Actual Date: 20060701
Action: CA002IL
NAICS Code(s): 332431 332812
Metal Can Manufacturing
Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: OHD004253225
EPA Region: 05
Area Name: ENTIRE FACILITY
Actual Date: 20070913

B-WAY CORPORATION (Continued) **1000270538**

Action: CA100 - RFI Imposition
NAICS Code(s): 332431 332812
Metal Can Manufacturing
Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: OHD004253225
EPA Region: 05
Area Name: ENTIRE FACILITY
Actual Date: 19910927
Action: CA075ME - CA Prioritization, Facility or area was assigned a medium corrective action priority
NAICS Code(s): 332431 332812
Metal Can Manufacturing
Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: OHD004253225
EPA Region: 05
Area Name: ENTIRE FACILITY
Actual Date: 19890929
Action: CA050 - RFA Completed
NAICS Code(s): 332431 332812
Metal Can Manufacturing
Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: OHD004253225
EPA Region: 05
Area Name: ENTIRE FACILITY
Actual Date: 19890929
Action: CA070YE - RFA Determination Of Need For An RFI, RFI is Necessary
NAICS Code(s): 332431 332812
Metal Can Manufacturing
Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: OHD004253225
EPA Region: 05
Area Name: ENTIRE FACILITY
Actual Date: 19940331
Action: CA075ME - CA Prioritization, Facility or area was assigned a medium corrective action priority
NAICS Code(s): 332431 332812
Metal Can Manufacturing
Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
Original schedule date: Not reported
Schedule end date: Not reported

B-WAY CORPORATION (Continued) **1000270538**

DERR:

DERR ID:	531000963
District:	SWDO
Alias:	Not reported
Lat/Long:	39.1408 -84.3163
EPA ID:	OHD004253225
Program:	**Site Assessment**

DERR ID:	531002968
District:	SWDO
Alias:	Not reported
Lat/Long:	Not reported
EPA ID:	Not reported
Program:	**Not reported**

SPILLS:

Spill No.:	8907-31-2617
Spill Year:	1989
Date Spill Reported:	07/12/1989
Spill Month:	7
Spill Number:	2617
Reporter Name:	COMPANY
Confidential:	No
District Code:	SW
Employee Number:	Not reported
Lat/Long:	Not reported
Product Spilled Name:	HISOL 15

Spill No.:	9509-31-3850
Spill Year:	1995
Date Spill Reported:	09/11/1995
Spill Month:	9
Spill Number:	3850
Reporter Name:	ROGER CROWDER
Confidential:	No
District Code:	SW
Employee Number:	Not reported
Lat/Long:	Not reported
Product Spilled Name:	COATING

AIRS:

Facility Id:	1431340460
Permit Classification:	A
# Emission Units Meeting Def of Trivial Outlined in EngGuide62:	0
Insignificant Emission Units:	22
Significant Emission Units:	16
Contact First Name:	John
Contact Last Name:	Tucker
Mailing Address 1:	8200 Broadwell Road
Mailing Address 2:	Not reported
Mailing City/State/Zip:	Cincinnati, OH 45244
Contact Phone:	5133882200
Contact EMail:	john.tucker@bwaycorp.com

2020 COR ACTION:

B-WAY CORPORATION (Continued) **1000270538**

EPA ID: OHD004253225
Region: 5
Action: Not reported

AIRS (AFS):

Compliance and Violation Data Major Sources:

EPA plant ID:	110000393878
Plant name:	B-WAY CORPORATION
Plant address:	8200 BROADWELL ROAD CINCINNATI, OH 45244
County:	HAMILTON
Region code:	05
Dunn & Bradst #:	Not reported
Air quality cntrl region:	079
Sic code:	3411
Sic code desc:	METAL CANS
North Am. industrial classf:	332431
NAIC code description:	Metal Can Manufacturing
Default compliance status:	UNKNOWN COMPLIANCE STATUS
Default classification:	ACTUAL OR POTENTIAL EMISSIONS ARE ABOVE THE APPLICABLE MAJOR SOURCE THRESHOLDS
Govt facility:	ALL OTHER FACILITIES NOT OWNED OR OPERATED BY A FEDERAL, STATE, OR LOCAL GOVERNMENT
Current HPV:	Not reported

Compliance and Enforcement Major Issues:

Air program:	TITLE V PERMITS
National action type:	MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved:	000720
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved:	020502
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	020827
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	020827
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	020827
Penalty amount:	Not reported
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	020827
Penalty amount:	Not reported

B-WAY CORPORATION (Continued) **1000270538**

Air program:	TITLE V PERMITS
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	020827
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	020827
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	020827
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE DAY 0
Date achieved:	021011
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE DAY 0
Date achieved:	021011
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	021030
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	021030
Penalty amount:	Not reported
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	021030
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	NXXXXX
Date achieved:	030225
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	NXXXXX
Date achieved:	030225
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	FINAL COMPLIANCE
Date achieved:	030312
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	FINAL COMPLIANCE

B-WAY CORPORATION (Continued) **1000270538**

Date achieved: 030312
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE DAY 0
Date achieved: 030411
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE DAY 0
Date achieved: 030411
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved: 030501
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 030514
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 030514
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: NXXXXX
Date achieved: 030527
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: NXXXXX
Date achieved: 030527
Penalty amount: 000000000

Air program: NSPS
National action type: EPA CONDUCTED PCE/ ON-SITE
Date achieved: 030625
Penalty amount: Not reported

Air program: NSPS
National action type: EPA CONDUCTED FCE / ON-SITE
Date achieved: 030625
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: EPA CONDUCTED PCE/ ON-SITE
Date achieved: 030625
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: EPA CONDUCTED PCE/ ON-SITE
Date achieved: 030625
Penalty amount: Not reported

B-WAY CORPORATION (Continued) **1000270538**

Air program:	TITLE V PERMITS
National action type:	EPA CONDUCTED FCE / ON-SITE
Date achieved:	030625
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	EPA CONDUCTED FCE / ON-SITE
Date achieved:	030625
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE REPORTED AS ADDED
Date achieved:	030729
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE REPORTED AS ADDED
Date achieved:	030729
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION EPA REVIEW
Date achieved:	030910
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	SV RESOLVED
Date achieved:	030925
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	SV RESOLVED
Date achieved:	030925
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE REPORTED AS ADDED
Date achieved:	030925
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE REPORTED AS ADDED
Date achieved:	030925
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	030926
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	030926
Penalty amount:	Not reported
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE CONDUCTED PCE/ ON-SITE

B-WAY CORPORATION (Continued) **1000270538**

Date achieved: 031113
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 031113
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 031113
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION EPA REVIEW
Date achieved: 040218
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved: 040503
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 040519
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 040519
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 040528
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 040528
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 040528
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 040528
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 040528
Penalty amount: Not reported

B-WAY CORPORATION (Continued) **1000270538**

Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	040826
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	040826
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	040826
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	040826
Penalty amount:	Not reported
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	040826
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	050912
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	050912
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	NXXXXX
Date achieved:	050914
Penalty amount:	000053600
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	NXXXXX
Date achieved:	050914
Penalty amount:	000053600
Air program:	SIP SOURCE
National action type:	NXXXXX
Date achieved:	050914
Penalty amount:	000053600
Air program:	SIP SOURCE
National action type:	FINAL COMPLIANCE
Date achieved:	050928
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	FINAL COMPLIANCE

B-WAY CORPORATION (Continued) **1000270538**

Date achieved: 050928
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: FINAL COMPLIANCE
Date achieved: 050928
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: FINAL COMPLIANCE
Date achieved: 050929
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: FINAL COMPLIANCE
Date achieved: 050929
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 050929
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 050929
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 050929
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: FINAL COMPLIANCE
Date achieved: 050929
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 051004
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 051004
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 051004
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 051004
Penalty amount: Not reported

B-WAY CORPORATION (Continued) **1000270538**

Air program:	TITLE V PERMITS
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	051004
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	051006
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	051006
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	051006
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	051006
Penalty amount:	Not reported
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	051006
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	051130
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	051130
Penalty amount:	Not reported
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	051130
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	060505
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	060505
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW

B-WAY CORPORATION (Continued) **1000270538**

Date achieved: 060505
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 060625
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 060625
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 060625
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 060807
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 060807
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 060807
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 060814
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 060814
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 061019
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 061019
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 070430
Penalty amount: Not reported

B-WAY CORPORATION (Continued) **1000270538**

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 070430
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 070502
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 070502
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 071106
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 071106
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 071106
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 071106
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 071107
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 071107
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 071107
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 071107
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST

B-WAY CORPORATION (Continued) **1000270538**

Date achieved: 071108
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 071108
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 071108
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 071108
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED FCE / OFF-SITE
Date achieved: 080116
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / OFF-SITE
Date achieved: 080116
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 080501
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 080501
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 080505
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 080505
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 090429
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 090429
Penalty amount: Not reported

B-WAY CORPORATION (Continued) **1000270538**

Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	090508
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	090508
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	091021
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	091021
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	091021
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	091021
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	100303
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	100303
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	100429
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	100429
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	100510
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW

B-WAY CORPORATION (Continued) **1000270538**

Date achieved: 100510
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 110125
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 110125
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 110304
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 110304
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 110802
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 110802
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 110802
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 110802
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 110803
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 110803
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 110803
Penalty amount: Not reported

B-WAY CORPORATION (Continued) **1000270538**

Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	110803
Penalty amount:	Not reported

Air program:	SIP SOURCE
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	110804
Penalty amount:	Not reported

Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	110804
Penalty amount:	Not reported

Air program:	TITLE V PERMITS
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	110804
Penalty amount:	Not reported

Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	110804
Penalty amount:	Not reported

Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	120215
Penalty amount:	Not reported

Air program:	SIP SOURCE
National action type:	STATE CONDUCTED FCE / ON-SITE
Date achieved:	120215
Penalty amount:	Not reported

Air program:	TITLE V PERMITS
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	120423
Penalty amount:	Not reported

Air program:	SIP SOURCE
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved:	120423
Penalty amount:	Not reported

Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	120508
Penalty amount:	Not reported

Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	120508
Penalty amount:	Not reported

Air program:	TITLE V PERMITS
National action type:	TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY

B-WAY CORPORATION (Continued) **1000270538**

Date achieved: 130422
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 130611
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved: 970408
Penalty amount: 000000000

Historical Compliance Minor Sources:
State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1004
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1004
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1101
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1101
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1102
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1102
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1103
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1103
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1104
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1104
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1201
Air prog code hist file: NSPS

B-WAY CORPORATION (Continued) **1000270538**

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1201
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1202
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1202
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1203
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1203
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1204
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1204
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1301
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1301
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1302
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1302
Air prog code hist file: TITLE V PERMITS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1303
Air prog code hist file: NSPS

State compliance status: UNKNOWN COMPLIANCE STATUS
Hist compliance date: 1303
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1004
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION

B-WAY CORPORATION (Continued) **1000270538**

Hist compliance date: 1101
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1102
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1103
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1104
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1201
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1202
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1203
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1204
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1301
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1302
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1303
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - CERTIFICATION
Hist compliance date: 1004
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - CERTIFICATION
Hist compliance date: 1101
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1102
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1103

B-WAY CORPORATION (Continued) **1000270538**

Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1104
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1201
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1202
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1203
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1204
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1301
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1302
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1303
Air prog code hist file: SIP SOURCE

C19 **HEEKIN CAN INC** **OH RGA LUST** **S114768518**
WNW **8200 BROADWELL RD** **N/A**
1/4-1/2 **CINCINNATI, OH**
0.308 mi.
1626 ft. **Site 2 of 3 in cluster C**

Relative:
Lower

Actual:
537 ft.

RGA LUST:

2012	HEEKIN CAN INC	8200 BROADWELL RD
2011	HEEKIN CAN INC	8200 BROADWELL RD
2010	HEEKIN CAN INC	8200 BROADWELL RD
2009	HEEKIN CAN INC	8200 BROADWELL RD
2008	HEEKIN CAN INC	8200 BROADWELL RD
2007	HEEKIN CAN INC	8200 BROADWELL RD
2006	HEEKIN CAN INC	8200 BROADWELL RD
2005	HEEKIN CAN INC	8200 BROADWELL RD
2004	HEEKIN CAN INC	8200 BROADWELL RD
2003	HEEKIN CAN INC	8200 BROADWELL RD
2002	HEEKIN CAN INC	8200 BROADWELL RD
2001	HEEKIN CAN INC	8200 BROADWELL RD
2000	HEEKIN CAN INC	8200 BROADWELL RD
1999	HEEKIN CAN INC	8200 BROADWELL RD
1998	HEEKIN CAN INC	8200 BROADWELL RD
1997	HEEKIN CAN INC	8200 BROADWELL RD

HEEKIN CAN INC (Continued) **S114768518**

1996	HEEKIN CAN INC	8200 BROADWELL RD
1995	HEEKIN CAN INC	8200 BROADWELL RD
1994	HEEKIN CAN INC	8200 BROADWELL RD

C20
WNW
1/4-1/2
0.308 mi.
1626 ft.

HEEKIN CAN INC
8200 BROADWELL RD
CINCINNATI, OH 45244

Site 3 of 3 in cluster C

OH LUST **U004092887**
N/A

Relative:
Lower

Actual:
537 ft.

LUST:

Release Number: 31010455-N00001
Release Date: Not reported
Facility Status: Inactive
LTF Status: 1 SUS/CON from regulated UST
FR Status: NFA: No Further Action
Priority: 2
Review Date: 06/26/2000
Class: Viable Responsible Party has been identified

Count: 15 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
CINCINNATI	S114760979	EASTGATE TOOL RENTAL	715 SR 74		OH RGA LUST
CINCINNATI	S105245383	COLUMBIA TWNSHP COMPOST	KENNEDY AVE HILL AND DALE	45227	OH SWF/LF
CINCINNATI	S106283568	SENCO PRODUCTS	N/A		OH SPILLS
CINCINNATI	S114746566	ASHLAND MART	618 OLD SR 74		OH RGA LUST
CINCINNATI	U004201500	ASHLAND MART	618 OLD SR 74	45244	OH LUST, OH UST
CINCINNATI	S106472639	SENCO	OUTFALL 002		OH SPILLS
CINCINNATI	S114760980	EASTGATE TOOL RENTAL	715 ST RT 74		OH RGA LUST
CINCINNATI	S113867574	FAIRFAX, VILLAGE OF	2918 SOUTHERN AVENUE	45227	OH SWF/LF
CINCINNATI	S114754955	CITY OF CINCINNATI	729 STATE ST		OH RGA LUST
CINCINNATI	S111211159	FORMER SERVICE STATION	STATE AND GEST NE CORNER		OH LUST
CINCINNATI	S114744388	ABANDON TANK	WINTON RD/COMPTON RT OF WAY		OH RGA LUST
MOUNT CARMEL	1007990587	CARSTAR COLLISION CARE OF EASTGATE	580 OLD STATE RTE 74	45244	RCRA-CESQG
MT CARMEL	U004201365	EZ SHOP FOOD MART	481 OLD ST RT 74	45244	OH LUST, OH UST
MT CARMEL	U000889976	EZ SHOP FOOD MART	481 OLD ST RT 74	45244	OH ARCHIVE UST
TERRACE PARK	U004087632	CLAIRE SECTION HOUSE	MIAMI & HWY 50	45244	OH LUST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/21/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/09/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 01/09/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 05/31/2013
Date Data Arrived at EDR: 07/08/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 151

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/10/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 12/17/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/14/2014	Telephone: 703-603-0695
Date Made Active in Reports: 01/28/2014	Last EDR Contact: 03/10/2014
Number of Days to Update: 14	Next Scheduled EDR Contact: 06/23/2014
	Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 12/17/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 01/14/2014	Telephone: 703-603-0695
Date Made Active in Reports: 01/28/2014	Last EDR Contact: 03/10/2014
Number of Days to Update: 14	Next Scheduled EDR Contact: 06/23/2014
	Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 11/20/2013	Source: Department of the Navy
Date Data Arrived at EDR: 11/21/2013	Telephone: 843-820-7326
Date Made Active in Reports: 02/24/2014	Last EDR Contact: 02/14/2014
Number of Days to Update: 95	Next Scheduled EDR Contact: 06/02/2014
	Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/30/2013	Source: National Response Center, United States Coast Guard
Date Data Arrived at EDR: 10/01/2013	Telephone: 202-267-2180
Date Made Active in Reports: 12/06/2013	Last EDR Contact: 04/04/2014
Number of Days to Update: 66	Next Scheduled EDR Contact: 07/14/2014
	Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: This state does not maintain a SHWS list. See the Federal CERCLIS list and Federal NPL list.

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: N/A	Source: Ohio EPA
Date Data Arrived at EDR: N/A	Telephone: 614-644-2924
Date Made Active in Reports: N/A	Last EDR Contact: 02/10/2014
Number of Days to Update: N/A	Next Scheduled EDR Contact: 05/26/2014
	Data Release Frequency: N/A

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

DERR: Division of Emergency & Remedial Response's Database

The DERR listings contains sites from all of Ohio that are in the Division of Environmental Response and Revitalization (DERR) database, which is an index of sites for which our district offices maintain files. The database is NOT a record of contaminated sites or sites suspected of contamination. Not all sites in the database are contaminated, and a site's absence from the database does not imply that it is uncontaminated.

Date of Government Version: 01/09/2014
Date Data Arrived at EDR: 01/10/2014
Date Made Active in Reports: 02/18/2014
Number of Days to Update: 39

Source: Ohio EPA
Telephone: 614-644-3538
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Semi-Annually

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Licensed Solid Waste Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 10/29/2013
Date Data Arrived at EDR: 11/01/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 45

Source: Ohio Environmental Protection Agency
Telephone: 614-644-2621
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Annually

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank File

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 02/16/2014
Date Data Arrived at EDR: 02/19/2014
Date Made Active in Reports: 03/26/2014
Number of Days to Update: 35

Source: Department of Commerce
Telephone: 614-752-8200
Last EDR Contact: 02/19/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

UNREG LTANKS: Ohio Leaking UST File

A suspected or confirmed release of petroleum from a non-regulated UST.

Date of Government Version: 08/25/1999
Date Data Arrived at EDR: 08/19/2003
Date Made Active in Reports: 08/26/2003
Number of Days to Update: 7

Source: Department of Commerce
Telephone: 614-752-7938
Last EDR Contact: 08/01/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/06/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 29

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 184

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 02/21/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 08/27/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 66

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

State and tribal registered storage tank lists

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UST: Underground Storage Tank Tank File

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 02/16/2014
Date Data Arrived at EDR: 02/19/2014
Date Made Active in Reports: 03/26/2014
Number of Days to Update: 35

Source: Department of Commerce
Telephone: 614-752-8200
Last EDR Contact: 02/19/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 01/27/2014
Number of Days to Update: 271

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 11/21/2013
Date Data Arrived at EDR: 11/26/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 90

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 02/13/2014
Date Data Arrived at EDR: 02/14/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 10

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 01/29/2014
Date Data Arrived at EDR: 01/29/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 42

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/28/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 43

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 08/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 92

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 07/30/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 129

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 02/06/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 65

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

ENG CONTROLS: Sites with Engineering Controls

A database that tracks properties with engineering controls.

Date of Government Version: 01/09/2014
Date Data Arrived at EDR: 01/10/2014
Date Made Active in Reports: 02/18/2014
Number of Days to Update: 39

Source: Ohio EPA
Telephone: 614-644-2306
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Semi-Annually

INST CONTROL: Sites with Institutional Engineering Controls

A database that tracks properties with institutional controls.

Date of Government Version: 01/09/2014
Date Data Arrived at EDR: 01/10/2014
Date Made Active in Reports: 02/18/2014
Number of Days to Update: 39

Source: Ohio Environmental Protection Agency
Telephone: 614-644-2306
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Semi-Annually

HIST ENG CONTROLS: Operation & Maintenance Agreements Database

Volunteers that complete a voluntary action that relies on the ongoing operation and maintenance (O&M) of an engineered control to make the site protective (e.g" cap systems and ground water treatment systems) must enter into a legally binding agreement with the Ohio EPA before the director issues a covenant not to sue. This O&M Agreement must describe how the remedy is constructed and how itwill be monitored, maintained and repaired. It also lays out inspection opportunities for the agency. Companies must document that they have the financial capability to operate any remedy relied on, before the agency will agree to enter into the O&M Agreement. The statute requires that the agency be notified of any change in ownership. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005
Date Data Arrived at EDR: 04/04/2006
Date Made Active in Reports: 05/04/2006
Number of Days to Update: 30

Source: Ohio EPA
Telephone: 614-644-2306
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

HIST INST CONTROLS: Institutional Controls Database

"Institutional control" is a restriction that is recorded in the same manner as a deed which limits access to or use of the property such that exposure to hazardous substances or petroleum are effectively and reliably eliminated or mitigated. Examples of institutional controls include land and water use restrictions. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005
Date Data Arrived at EDR: 04/06/2006
Date Made Active in Reports: 05/04/2006
Number of Days to Update: 28

Source: Ohio EPA
Telephone: 614-644-2306
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/17/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 04/01/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

VCP: Voluntary Action Program Sites

Site involved in the Voluntary Action Program.

Date of Government Version: 03/31/2014
Date Data Arrived at EDR: 01/10/2014
Date Made Active in Reports: 02/18/2014
Number of Days to Update: 39

Source: Ohio EPA, Voluntary Action Program
Telephone: 614-728-1298
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Semi-Annually

State and tribal Brownfields sites

BROWNFIELDS: Ohio Brownfield Inventory

A statewide brownfields inventory. A brownfield is an abandoned, idled or under-used industrial or commercial property where expansion or redevelopment is complicated by known or potential releases of hazardous substances and/or petroleum.

Date of Government Version: 12/16/2013
Date Data Arrived at EDR: 12/18/2013
Date Made Active in Reports: 02/18/2014
Number of Days to Update: 62

Source: Ohio EPA
Telephone: 614-644-3748
Last EDR Contact: 03/21/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/24/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/20/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: No Update Planned

SWRCY: Recycling Facility Listing

A listing of recycling facility locations.

Date of Government Version: 01/14/2013
Date Data Arrived at EDR: 01/15/2013
Date Made Active in Reports: 03/19/2013
Number of Days to Update: 63

Source: Ohio EPA
Telephone: 614-728-5357
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

HIST LF: Old Solid Waste Landfill

A list of about 1200 old abandoned dumps or landfills. This database was developed from Ohio EPA staff notebooks and other information dating from the mid-1970s

Date of Government Version: 01/01/1980
Date Data Arrived at EDR: 07/01/2003
Date Made Active in Reports: 07/17/2003
Number of Days to Update: 16

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 06/26/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 12/04/2013
Date Data Arrived at EDR: 12/10/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 65

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Quarterly

CDL: Clandestine Drug Lab Locations

A list of clandestine drug lab sites with environmental impact. This list is extracted from the SPILLS database based on the "product" type.

Date of Government Version: 03/06/2014
Date Data Arrived at EDR: 03/07/2014
Date Made Active in Reports: 03/26/2014
Number of Days to Update: 19

Source: Ohio EPA
Telephone: 614-644-2080
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/04/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: No Update Planned

Local Lists of Registered Storage Tanks

ARCHIVE UST: Archived Underground Storage Tank Sites

Underground storage tank records that have been removed from the Underground Storage Tank database.

Date of Government Version: 02/16/2014
Date Data Arrived at EDR: 02/19/2014
Date Made Active in Reports: 03/26/2014
Number of Days to Update: 35

Source: Department of Commerce, Division of State Fire Marshal
Telephone: 614-752-7938
Last EDR Contact: 02/19/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 04/25/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/03/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 52

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/01/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Annually

SPILLS: Emergency Response Database

Incidents reported to the Emergency Response Unit. The focus of the ER program is to minimize the impact on the environment from accidental releases, spills, and unauthorized discharges from any fixed or mobile sources. Incidents involving petroleum products, hazardous materials, hazardous waste, abandoned drums, or other materials which may pose as a pollution threat to the state?s water, land, or air should be reported immediately. Not all incidents included in the database are actual SPILLS, they can simply be reported incidents.

Date of Government Version: 03/06/2014
Date Data Arrived at EDR: 03/07/2014
Date Made Active in Reports: 03/26/2014
Number of Days to Update: 19

Source: Ohio EPA
Telephone: 614-644-2084
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 10/02/2013
Date Made Active in Reports: 12/16/2013
Number of Days to Update: 75

Source: Environmental Protection Agency
Telephone: 312-886-6186
Last EDR Contact: 03/13/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/06/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 15

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 31

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/27/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/11/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/25/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 28

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/05/2014
Next Scheduled EDR Contact: 06/16/2014
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/31/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 44

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 02/26/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/28/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/09/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2013
Date Data Arrived at EDR: 07/17/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 107

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 01/28/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/22/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 03/10/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/09/2014
Date Data Arrived at EDR: 01/10/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/10/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/18/2013
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 13

Source: EPA
Telephone: (312) 353-2000
Last EDR Contact: 03/14/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 11/01/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 01/27/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 02/28/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Biennially

TOWNGAS: DERR Towngas Database
The database includes 82 very old sites (circa 1895) which produced gas from coal for street lighting. Most visual evidence of these sites has disappeared, however the potential for buried coal tar remains. The database is no longer in active use.

Date of Government Version: 07/28/1992
Date Data Arrived at EDR: 02/21/2003
Date Made Active in Reports: 03/05/2003
Number of Days to Update: 12

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 02/12/2003
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UIC: Underground Injection Wells Listing
A listing of underground injection well locations.

Date of Government Version: 02/10/2014
Date Data Arrived at EDR: 02/12/2014
Date Made Active in Reports: 03/26/2014
Number of Days to Update: 42

Source: Ohio EPA
Telephone: 614-644-2752
Last EDR Contact: 02/12/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

DRYCLEANERS: Drycleaner Facility Listing
A listing of drycleaner facility locations.

Date of Government Version: 12/30/2013
Date Data Arrived at EDR: 01/02/2014
Date Made Active in Reports: 02/18/2014
Number of Days to Update: 47

Source: Ohio EPA
Telephone: 614-644-3469
Last EDR Contact: 03/31/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Varies

NPDES: NPDES General Permit List
General information regarding NPDES (National Pollutant Discharge Elimination System) permits.

Date of Government Version: 02/10/2014
Date Data Arrived at EDR: 02/12/2014
Date Made Active in Reports: 03/28/2014
Number of Days to Update: 44

Source: Ohio EPA
Telephone: 614-644-2031
Last EDR Contact: 02/12/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Semi-Annually

AIRS: Title V Permits Listing
A listing of Title V Permits issued by the Division of Air Pollution Control. It is a federal operating permit program adopted and implemented by the state. The basic program elements typically specify that major sources will submit an operating application to the specified state environmental regulatory agency according to a schedule.

Date of Government Version: 12/30/2013
Date Data Arrived at EDR: 01/02/2014
Date Made Active in Reports: 02/18/2014
Number of Days to Update: 47

Source: Ohio EPA
Telephone: 614-644-2270
Last EDR Contact: 03/24/2014
Next Scheduled EDR Contact: 07/07/2014
Data Release Frequency: Varies

USD: Urban Setting Designation Sites
A USD may be requested for properties participating in the VAP when there is no current or future use of the ground water by local residents for drinking, showering, bathing or cooking. In these areas, an approved USD would lower the cost of cleanup and promote economic redevelopment while still protecting public health and safety. If these USDs were to be approved, the ground water cleanup or response requirements for the areas could be lessened. The Ohio EPA director may approve a USD request based on a demonstration that the USD requirements are met and an evaluation of existing and future uses of ground water in the area. The Ohio EPA director’s decision on approval or denial of the request is needed before cleanup requirements for the site can be determined.

Date of Government Version: 01/09/2014
Date Data Arrived at EDR: 01/10/2014
Date Made Active in Reports: 02/18/2014
Number of Days to Update: 39

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

HIST USD: Urban Setting Designations Database

A USD may be requested for properties participating in the VAP when there is no current or future use of the ground water by local residents for drinking, showering, bathing or cooking. In these areas, an approved USD would lower the cost of cleanup and promote economic redevelopment while still protecting public health and safety. If these USDs were to be approved, the ground water cleanup or response requirements for the areas could be lessened. The Ohio EPA director may approve a USD request based on a demonstration that the USD requirements are met and an evaluation of existing and future uses of ground water in the area. The Ohio EPA director’s decision on approval or denial of the request is needed before cleanup requirements for the site can be determined. This database is no longer updated or maintained by the state agency.

Date of Government Version: 05/10/2005
Date Data Arrived at EDR: 04/25/2006
Date Made Active in Reports: 05/11/2006
Number of Days to Update: 16

Source: Ohio EPA
Telephone: 614-644-3749
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/15/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 01/29/2013
Date Data Arrived at EDR: 02/14/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 01/03/2014
Next Scheduled EDR Contact: 04/21/2014
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 05/18/2012	Telephone: 703-308-4044
Date Made Active in Reports: 05/25/2012	Last EDR Contact: 02/14/2014
Number of Days to Update: 7	Next Scheduled EDR Contact: 05/26/2014
	Data Release Frequency: Varies

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 04/15/2013	Source: EPA
Date Data Arrived at EDR: 07/03/2013	Telephone: 202-564-6023
Date Made Active in Reports: 09/13/2013	Last EDR Contact: 04/04/2014
Number of Days to Update: 72	Next Scheduled EDR Contact: 07/14/2014
	Data Release Frequency: Quarterly

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005	Source: U.S. Geological Survey
Date Data Arrived at EDR: 02/06/2006	Telephone: 888-275-8747
Date Made Active in Reports: 01/11/2007	Last EDR Contact: 01/15/2014
Number of Days to Update: 339	Next Scheduled EDR Contact: 04/28/2014
	Data Release Frequency: N/A

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/23/2013	Source: EPA
Date Data Arrived at EDR: 11/06/2013	Telephone: 202-564-5962
Date Made Active in Reports: 12/06/2013	Last EDR Contact: 03/31/2014
Number of Days to Update: 30	Next Scheduled EDR Contact: 07/14/2014
	Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/23/2013	Source: EPA
Date Data Arrived at EDR: 11/06/2013	Telephone: 202-564-5962
Date Made Active in Reports: 12/06/2013	Last EDR Contact: 03/31/2014
Number of Days to Update: 30	Next Scheduled EDR Contact: 07/14/2014
	Data Release Frequency: Annually

CRO: Cessation of Regulated Operations Facility Listing

"Cessation of Regulated Operations" means the discontinuation or termination of regulated operations or the finalizing of any transaction or proceeding through which those operations are discontinued. "Regulated Operations" means the production, use, storage or handling of regulated substances.

Date of Government Version: 01/24/2014
Date Data Arrived at EDR: 02/13/2014
Date Made Active in Reports: 03/26/2014
Number of Days to Update: 41

Source: Ohio EPA
Telephone: 614-644-3065
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information
All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 11/20/2013
Date Data Arrived at EDR: 12/03/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 02/14/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Quarterly

Financial Assurance: Financial Assurance Information Listing
Financial assurance information.

Date of Government Version: 01/13/2014
Date Data Arrived at EDR: 01/15/2014
Date Made Active in Reports: 02/18/2014
Number of Days to Update: 34

Source: Ohio EPA
Telephone: 614-644-2955
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 01/30/2014
Next Scheduled EDR Contact: 05/12/2014
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/11/2014
Next Scheduled EDR Contact: 06/23/2014
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Site Listing
A listing of coal ash disposal site locations.

Date of Government Version: 02/07/2012
Date Data Arrived at EDR: 02/17/2012
Date Made Active in Reports: 03/28/2012
Number of Days to Update: 40

Source: Ohio EPA
Telephone: 614-644-2134
Last EDR Contact: 01/13/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Varies

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 02/10/2014
Next Scheduled EDR Contact: 05/26/2014
Data Release Frequency: Quarterly

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Ohio Environmental Procetion Agency in Ohio.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Ohio Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Commerce in Ohio.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/20/2013
Number of Days to Update: 172

Source: Department of Commerce
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 02/21/2014
Next Scheduled EDR Contact: 06/02/2014
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/17/2014
Next Scheduled EDR Contact: 04/28/2014
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/07/2014
Date Made Active in Reports: 03/31/2014
Number of Days to Update: 52

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 03/12/2014
Next Scheduled EDR Contact: 05/19/2014
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 07/24/2013
Date Made Active in Reports: 08/19/2013
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 06/21/2013
Date Made Active in Reports: 08/05/2013
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 02/24/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Annually

VT MANIFEST: Hazardous Waste Manifest Data
Hazardous waste manifest information.

Date of Government Version: 12/30/2013
Date Data Arrived at EDR: 02/11/2014
Date Made Active in Reports: 03/11/2014
Number of Days to Update: 28

Source: Department of Environmental Conservation
Telephone: 802-241-3443
Last EDR Contact: 01/20/2014
Next Scheduled EDR Contact: 05/05/2014
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 08/09/2013
Date Made Active in Reports: 09/27/2013
Number of Days to Update: 49

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 03/17/2014
Next Scheduled EDR Contact: 06/30/2014
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Child Day Care Facilities
Source: Department of Job & Family Services
Telephone: 614-466-6282

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Natural Resources
Telephone: 614-265-1044

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

SENCO
8450 BROADWELL ROAD
CINCINNATI, OH 45244

TARGET PROPERTY COORDINATES

Latitude (North):	39.1353 - 39˚ 8’ 7.08’’
Longitude (West):	84.3137 - 84˚ 18’ 49.32’’
Universal Tranverse Mercator:	Zone 16
UTM X (Meters):	732191.2
UTM Y (Meters):	4335019.5
Elevation:	562 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	39084-B3 MADEIRA, OH
Most Recent Revision:	1996
South Map:	39084-A3 WITHAMSVILLE, OH KY
Most Recent Revision:	1996

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

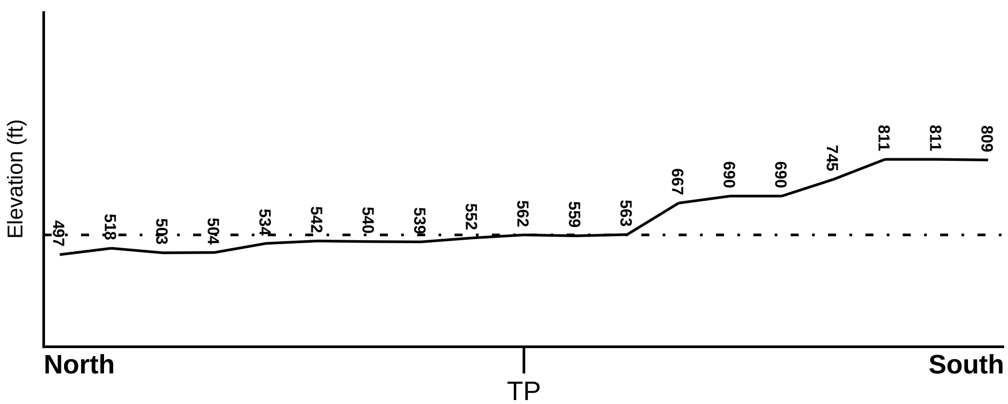
TOPOGRAPHIC INFORMATION

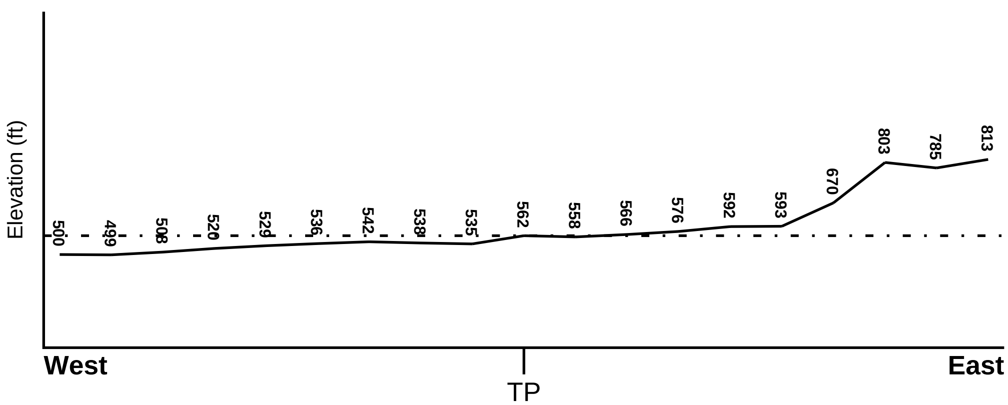
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 562 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
HAMILTON, OH	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 39061C - FEMA DFIRM Flood data

Additional Panels in search area: 39025C - FEMA DFIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
MADEIRA	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

GEOLOGIC AGE IDENTIFICATION

Era:	Paleozoic	Category:	Stratified Sequence
System:	Ordovician		
Series:	Upper Ordovician (Cincinnatian)		
Code:	O3 *(decoded above as Era, System & Series)*		

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name: ELDEAN

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	12 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 2.00 Min: 0.60	Max: 7.30 Min: 5.60
2	12 inches	23 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.20	Max: 7.80 Min: 5.60
3	23 inches	30 inches	very gravelly - clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.60	Max: 8.40 Min: 6.60
4	30 inches	60 inches	stratified	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 20.00 Min: 6.00	Max: 8.40 Min: 7.40

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: clay loam
silt loam
silty clay loam

Surficial Soil Types: clay loam
silt loam
silty clay loam

Shallow Soil Types: silty clay loam
clay loam
silt loam
sandy clay loam

Deeper Soil Types: gravelly - coarse sand
sand and gravel
clay loam
loam

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

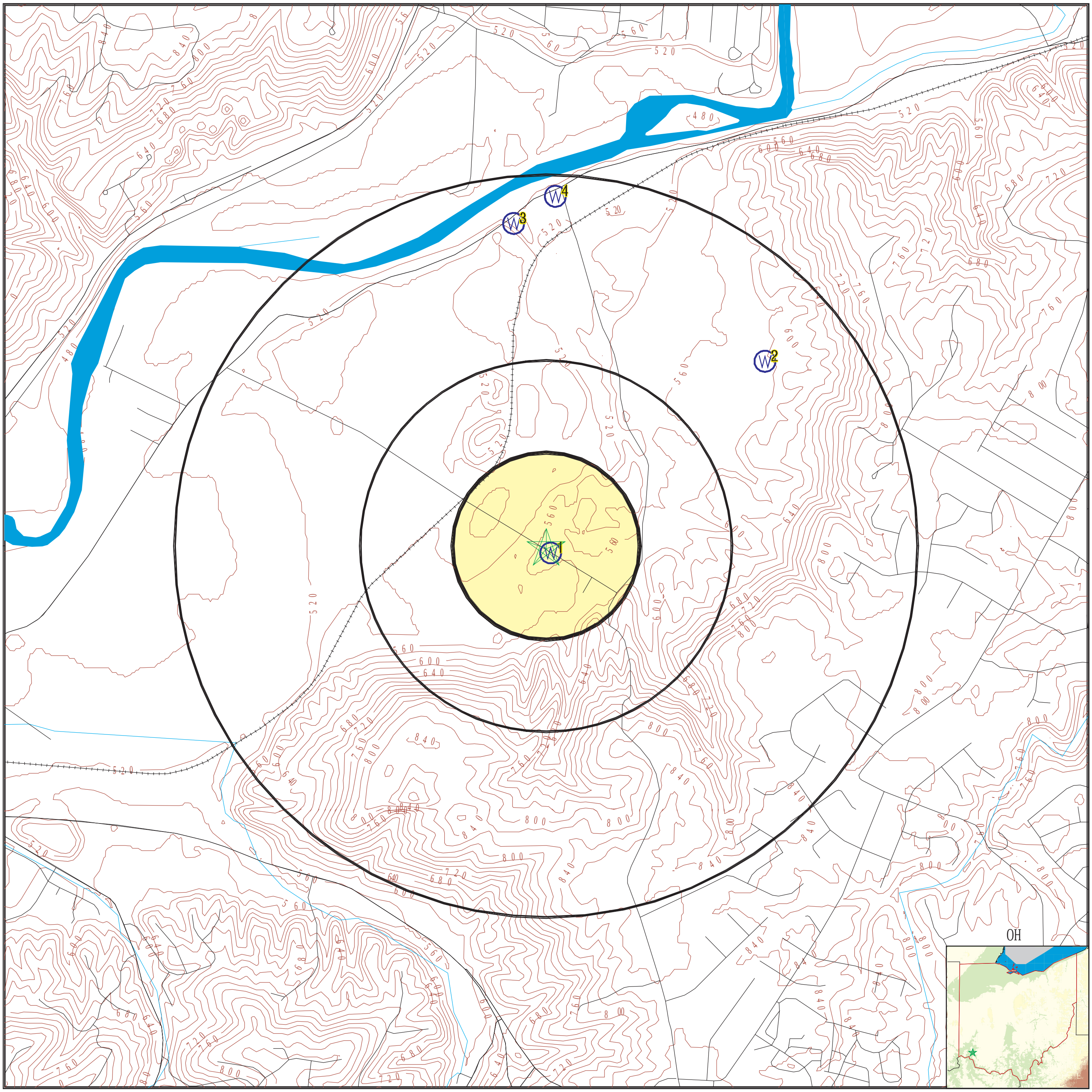
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	OHD500000610287	0 - 1/8 Mile SSE
2	OHD500000780760	1/2 - 1 Mile NE
3	OHPW50000000227	1/2 - 1 Mile North
4	OHWT30000000071	1/2 - 1 Mile North

PHYSICAL SETTING SOURCE MAP - 3901204.2s



County Boundary
Major Roads
Contour Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

Groundwater Flow Direction
GI Indeterminate Groundwater Flow at Location
GV Groundwater Flow Varies at Location

SITE NAME:	Senco	CLIENT:	TRC Environmental Corporation
ADDRESS:	8450 Broadwell Road Cincinnati OH 45244	CONTACT:	Joe Bruns
		INQUIRY #:	3901204.2s
LAT/LONG:	39.1353 / 84.3137	DATE:	April 04, 2014 12:26 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation		Database	EDR ID Number
1 **SSE** **0 - 1/8 Mile** **Higher**		**OH WELLS**	**OHD500000610287**

Well log n:	889817		
Well type :	W		
End user i:	602		
Cnty code:	61	Twp code:	55
Orig owner:	Not Reported	Orig own 1:	PAVERSTONE CO
Drill type:	CT	Test type :	P
Well use c:	IND	Aquifer ty:	UND
Loc map ye:	Not Reported	Loc area:	Not Reported
Loc no:	0		
Sub name:	Not Reported	Sub map ye:	Not Reported
Sub no:	Not Reported	Permit no:	Not Reported
Sec owner :	Not Reported	Lot no:	Not Reported
Sect no:	0		
St dir cod:	Not Reported		
St no:	8479		
St name:	BROADWELL	St type co:	RD
Sec add:	Not Reported		
Sec add no:	0		
City:	NEWTOWN	State code:	OH
Zip:	45224		
Zone code:	Not Reported		
Horiz x:	0		
Horiz y:	0		
Horiz datu:	NAD27		
Horiz acc :	0		
Horiz acc1:	0		
Horiz ac 1:	Not Reported		
Vert loc:	0		
Vert acc:	0		
Vert acc u:	Not Reported		
Latitude:	39.13497		
Longitude:	-84.31353		
Source of :	GEOCODE	Flowing we:	N
Test rate:	100		
Draw down:	5		
S water le:	65		
S water me:	G	S water 1:	28-FEB-00
Cas ht:	3		
Screen len:	0		
Total dept:	127		
Date of co:	28-FEB-00	Located in:	Not Reported
Assoc rpt :	Not Reported		
Depth to b:	0		
Drill year:	Not Reported		
Well seal :	0		
Screen slo:	0		
Screened i:	0		
Screened 1:	0		

Sustained :	100		
Attatch st:	Not Reported		
Screen dia:	0		
Screen typ:	Not Reported	Screen mat:	Not Reported
Pump type:	Not Reported		
Pump capac:	0		
Pump set a:	0		
Pitless ty:	Not Reported	Pump inst :	Not Reported
Elev sourc:	Not Reported		
Water leve:	0		
Well drill:	Not Reported	Subcon odh:	Not Reported
Site id:	OHD500000610287		

2
NE
1/2 - 1 Mile
Higher

OH WELLS **OHD500000780760**

Well log n:	2006314		
Well type :	W		
End user i:	1301		
Cnty code:	25	Twp code:	2900
Orig owner:	JASON	Orig own 1:	GORDON
Drill type:	CT	Test type :	B
Well use c:	D	Aquifer ty:	SGR
Loc map ye:	Not Reported	Loc area:	Not Reported
Loc no:	0		
Sub name:	Not Reported	Sub map ye:	Not Reported
Sub no:	Not Reported	Permit no:	Not Reported
Sec owner :	Not Reported	Lot no:	Not Reported
Sect no:	0		
St dir cod:	Not Reported		
St no:	4340		
St name:	MT. CARMEL	St type co:	RD
Sec add:	Not Reported		
Sec add no:	0		
City:	CINCINNATI	State code:	OH
Zip:	45244		
Zone code:	Not Reported		
Horiz x:	0		
Horiz y:	0		
Horiz datu:	Not Reported		
Horiz acc :	0		
Horiz acc1:	0		
Horiz ac 1:	Not Reported		
Vert loc:	598		
Vert acc:	25		
Vert acc u:	Not Reported		
Latitude:	39.14245		
Longitude:	-84.3028		
Source of :	GLOBAL POSITION SYSTEM	Flowing we:	N
Test rate:	10		
Draw down:	50		
S water le:	60		
S water me:	G	S water 1:	09-OCT-06
Cas ht:	2		
Screen len:	3		

Total dept:	140		
Date of co:	09-OCT-06	Located in:	Not Reported
Assoc rpt :	N		
Depth to b:	0		
Drill year:	Not Reported		
Well seal :	0		
Screen slo:	.015		
Screened i:	137		
Screened 1:	140		
Sustained :	10		
Attatch st:	Not Reported		
Screen dia:	6		
Screen typ:	CONTINOUS WIRE WOUND	Screen mat:	STAINLESS STEEL
Pump type:	Not Reported		
Pump capac:	0		
Pump set a:	0		
Pitless ty:	Not Reported	Pump inst :	Not Reported
Elev sourc:	GLOBAL POSITION SYSTEM		
Water leve:	0		
Well drill:	Not Reported	Subcon odh:	Not Reported
Site id:	OHD500000780760		

3
North
1/2 - 1 Mile
Lower

OH WELLS OHPW50000000227

Objectid:	2311		
County:	HAMILTON	Pwsid:	OH3132412
Well num:	13048		
Well name:	TOWNSHIP FIELDS & TAVERN WELL 0001		
Dnr wl log:	630326		
Wl avail:	PERMANENT	Act date:	15-OCT-99
Wl status:	Active	Sys status:	Active
Sys name:	TOWNSHIP FIELDS & TAVERN	Sys type:	Transient Non-Community water systems
Src type:	ground water		
Latitude:	39.147894		
Longitude:	-84.315322		
Accuracy:	1		
Ll colmeth:	GPS CODE MEASUREMENTS (PSEUDO RANGE) DIFFERENTIALLY CORRECTED		
Hdatum:	WGS 84		
Verify met:	VERIFIED RELATIVE TO MAP FEATURES (1:24,000)		
Site id:	OHPW50000000227		

4
North
1/2 - 1 Mile
Lower

OH WELLS OHWT30000000071

County:	HAMILTON	Pwsid:	OH3132412
Wtp num:	3745	Wtp name:	TOWNSHIP FIELDS & TAVERN
Tp avail:	PERMANENT	Wtr type:	ground water
Wtpdsn cap:	500		
Notreat in:	Not Reported	Wtr body n:	Not Reported
Wtp status:	Active	Sys status:	Active
Sys name:	TOWNSHIP FIELDS & TAVERN	Sys type:	Transient Non-Community water systems
Src type:	ground water	First name:	TOM
Last name:	SILL	Title:	Not Reported
Address1:	4575 MOUNT CARMEL RD		
Address2:	Not Reported		

City:	CINCINNATI	State:	OH
Zip:	45244	Phone:	513-831-0160
Emg phone:	513-319-7841		
Latitude:	39.148947		
Longitude:	-84.313225		
Accuracy:	1		
Ll colmeth:	GPS CODE MEASUREMENTS (PSEUDO RANGE) DIFFERENTIALLY CORRECTED		
Hdatum:	NAD 27		
Verify met:	VERIFIED RELATIVE TO MAP FEATURES (1:24,000)		
Site id:	OHWT30000000071		

AREA RADON INFORMATION

State Database: OH Radon

Radon Test Results

Zipcode	Num Tests	Maximum	Minimum	Arith Mean	Geo Mean
45244	289	18.6	0.1	3.48	2.31

Federal EPA Radon Zone for HAMILTON County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 45244

Number of sites tested: 3

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	Not Reported	Not Reported	Not Reported	Not Reported
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	2.800 pCi/L	67%	33%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Natural Resources
Telephone: 614-265-1044

HYDROGEOLOGIC INFORMATION

AQUIFLOW^R Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Public Water System Data
Source: Ohio Environmental Protection Agency
Telephone: 614-644-2752
The database includes community, transient noncommunity and nontransient noncommunity water wells; and source treatment unit locations.

Water Well Database
Source: Department of Natural Resources
Telephone: 614-265-6740

OTHER STATE DATABASE INFORMATION

RADON

State Database: OH Radon
Source: Department of Health
Telephone: 614-644-2727
Radon Statistics for Zip Code Areas

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

STREET AND ADDRESS INFORMATION

Appendix II

Historical Research Documentation

Senco
8450 Broadwell Road
Cincinnati, OH 45244

Inquiry Number: 3901204.5
April 04, 2014

The EDR-City Directory Abstract

EDR® Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Executive Summary

Findings

City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at five year intervals.

Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1920 through 2013. This report compiles information gathered in this review by geocoding the latitude and longitude of properties identified and gathering information about properties within 660 feet of the target property.

A summary of the information obtained is provided in the text of this report.

RECORD SOURCES

EDR is licensed to reproduce certain City Directory works. Reproduction of City Directories without permission of the publisher may be a violation of copyright.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

Year	***Source***	***TP***	***Adjoining***	***Text Abstract***	***Source Image***
2013	Cole Information Services	-	X	X	-
	Cole Information Services	X	X	X	-
2008	Haines Company, Inc.	-	X	X	-
2002	Haines Company	X	X	X	-
	Haines Company	X	X	X	X
	Haines & Company	X	X	X	X
1995	R. L. Polk Co.	-	X	X	X
	R. L. Polk Co.	X	X	X	X
1989	R. L. Polk Co.	-	-	-	-
1983	The Williams Directory Co.,	-	-	-	-
1979	The Williams Directory Co.,	-	-	-	-
1974	The Williams Directory Co.,	-	-	-	-
1969	THE WILLIAMS DIRECTORY CO.	-	-	-	-
1964	The Williams Directory Co.,	-	-	-	-
1961	THE WILLIAMS DIRECTORY CO.	-	-	-	-

EXECUTIVE SUMMARY

Year	Source	TP	Adjoining	Text Abstract	Source Image
1958	The Williams Directory Co.,	-	-	-	-
1952	The Williams Directory Co.,	-	-	-	-
1947	The Williams Directory Co.,	-	-	-	-
1940	The Williams Directory Co.,	-	-	-	-
1935	The Williams Directory Co.,	-	-	-	-
1930	The Williams Directory Co.,	-	-	-	-
1925	The Williams Directory Co.,	-	-	-	-
1920	The Williams Directory Co.,	-	-	-	-

FINDINGS

TARGET PROPERTY INFORMATION

ADDRESS

8450 Broadwell Road
Cincinnati, OH 45244

FINDINGS DETAIL

Target Property research detail.

BROADWELL RD

8450 BROADWELL RD

Year	*Uses*	*Source*	
2002	XXXX	Haines Company	
	XXXX	Haines & Company	Image pg. A1

8485 BROADWELL RD

Year	*Uses*	*Source*	
2013	GYMNASTICS CENTRAL	Cole Information Services	
	UNIVERSAL PACKAGING SYSTEM INCORPORA	Cole Information Services	
2002	SENCO PRODS INC	Haines Company	
	SENCO PRODS INC	Haines & Company	Image pg. A1
1995	SENCO PRODS INC	R. L. Polk Co.	Image pg. A2

FINDINGS

ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

BROADWELL RD

8361 BROADWELL RD

Year	Uses	Source	
2008	ALUFABINC	Haines Company, Inc.	
	NIMMO FLUID	Haines Company, Inc.	
	POWER	Haines Company, Inc.	
2002	INTERTEC	Haines Company	
	INTERSTOPCORP	Haines Company	
	REFRCTRY	Haines Company	
	NORTH AMER	Haines Company	
	REFRCTRY	Haines & Company	Image pg. A1
	NORTH AMER	Haines & Company	Image pg. A1
	INTERTEC	Haines & Company	Image pg. A1
	INTERSTOPCORP	Haines & Company	Image pg. A1
1995	REFRACTORIES COMPANY	R. L. Polk Co.	Image pg. A2
	NORTH AMERICAN	R. L. Polk Co.	Image pg. A2

8391 BROADWELL RD

Year	Uses	Source	
2002	XXXX	Haines & Company	Image pg. A1
	XXXX	Haines Company	

8445 BROADWELL RD

Year	Uses	Source	
2002	XXXX	Haines Company	
	XXXX	Haines & Company	Image pg. A1

8479 BROADWELL RD

Year	Uses	Source	
2013	PAVESTONE	Cole Information Services	
2008	PAVESTONE	Haines Company, Inc.	
2002	PAVESTONECO	Haines Company	
	PAVESTONECO	Haines & Company	Image pg. A1
1995	UNI STONE	R. L. Polk Co.	Image pg. A2
	INTERPAVE CORP UII STONE	R. L. Polk Co.	Image pg. A2

FINDINGS

Year	Uses	Source	
1995	PAYERS UNI STONE	R. L. Polk Co.	Image pg. A2

8497 BROADWELL RD

Year	Uses	Source	
2008	HUGHETTWillanrd	Haines Company, Inc.	
2002	BJOHNSTONJA	Haines Company	
	BJOHNSTONJA	Haines & Company	Image pg. A1
1995	Johnston J A	R. L. Polk Co.	Image pg. A2

8505 BROADWELL RD

Year	Uses	Source	
2008	o YOUNGMike	Haines Company, Inc.	
2002	BYOUNG Mike	Haines Company	
	BYOUNG Mike	Haines & Company	Image pg. A1
1995	Young Larry M	R. L. Polk Co.	Image pg. A2
	Young Mike	R. L. Polk Co.	Image pg. A2

FINDINGS

TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

Address Researched	**Address Not Identified in Research Source**
8450 Broadwell Road	2008, 1989, 1983, 1979, 1974, 1969, 1964, 1961, 1958, 1952, 1947, 1940, 1935, 1930, 1925, 1920

ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

Address Researched	**Address Not Identified in Research Source**
8361 BROADWELL RD	2013, 1989, 1983, 1979, 1974, 1969, 1964, 1961, 1958, 1952, 1947, 1940, 1935, 1930, 1925, 1920
8391 BROADWELL RD	2013, 2008, 1995, 1989, 1983, 1979, 1974, 1969, 1964, 1961, 1958, 1952, 1947, 1940, 1935, 1930, 1925, 1920
8445 BROADWELL RD	2013, 2008, 1995, 1989, 1983, 1979, 1974, 1969, 1964, 1961, 1958, 1952, 1947, 1940, 1935, 1930, 1925, 1920
8479 BROADWELL RD	2013, 1989, 1983, 1979, 1974, 1969, 1964, 1961, 1958, 1952, 1947, 1940, 1935, 1930, 1925, 1920
8479 BROADWELL RD	2008, 2002, 1995, 1989, 1983, 1979, 1974, 1969, 1964, 1961, 1958, 1952, 1947, 1940, 1935, 1930, 1925, 1920
8497 BROADWELL RD	2013, 1989, 1983, 1979, 1974, 1969, 1964, 1961, 1958, 1952, 1947, 1940, 1935, 1930, 1925, 1920
8505 BROADWELL RD	2013, 1989, 1983, 1979, 1974, 1969, 1964, 1961, 1958, 1952, 1947, 1940, 1935, 1930, 1925, 1920

Source Page Images Appendix

TP	Adjoining	Source
✓	✓	Haines & Company

BROADWELL RD 2002

BROADWAY 45202 CONT

ZIP CODE 45210 CINCINNATI OH

WEALTH CODE 0 5

X HAUSMAN ALY
1105 XXXX OO
1106 XXXX OO
1108 CRUTCHFIELD A D 513-929-4906 9
X ELLIOT
1111 ●DESGRANGE Robert OO 9
1112 SMITH Kristen 513-784-0292 +2
1114 XXXX OO
1115 ●DESGRANGE Robert OO 9
1117 JOHNSON Geo 513-929-4109 +2
1118 ALLEN B 513-621-3425 7
COATES M 513-721-0288 1
EVANS Janeene 513-784-9107 +2
STANFORD Sophie 513-784-9258 1
1120 XXXX OO
1121 XXXX OO
1122 XXXX OO
1123 LUBBERS Melissa 513-723-0321 1
ROGERS Jimmy Lee 513-651-2226 1
1124 WILLIAMS Betty 513-723-1954 5
1126 XXXX OO
1130 XXXX OO
X 12TH E
1201 BATCHELOR Diane 513-621-7986 +2
JONES Morris 513-241-8113 8
1204 BOLDEN L 513-381-0397 7
PEAKE R 513-723-0646 +2
WHITE Cynthia 513-784-0608 +2
1206 WHITE Wayne 513-579-1918 5
1211 CLARK Jesse 513-929-0312 +2
DAWSON Christian 513-651-1195 +2
1214 XXXX OO
1216 XXXX OO
1218 BORDERS Grady 513-721-3461 0
CLARK Lateicha 513-929-4754 +2
JOHNSON Tony 513-929-4824 +2
RUCKER Stephanie 513-651-5732 1
X GREAR ALY
X LEVERING ALY E
X 13TH E
1304 XXXX OO
1306 CURLEY Tobias J 513-723-0107 +2
●VAUGHT John 513-784-9839 4
1308 CHATTOPADHYAY Jessica 513-333-0004 +2
CHATTOPADHYAY Partha 513-241-4810 +2
●RONNEY Willa OO 9
1310 ●WATKINS Sil OO 1
1312 ●SWEENEY Zachary OO +2
1314 EDWARDS Christina L 513-241-1665 +2
●STARKEY Samuel OO 0
1316 KING Alex 513-621-6333 0
X WOODWARD RD E
1320 BYRD S 513-721-0820 1
●FAY J D 513-621-9508 5
1324 ●JONES Kenneth 513-721-2655 ♦ 8
KESSLER Mark 513-421-1011 0
PHILLIPS-Bootes Linda 513-651-5921 +2
1326 GRAHAM G 513-784-1537 +2
GRAHAM G 513-784-9575 +2
●HAMMELRATH W OO 9
RELIHAN Tim M 513-421-6247 8
1328 BORDWELL K 513-579-8951 0
RUPARD Jeffrey Edw 513-665-9095 0
1330 ●BACHEMIN Jay OO +2
1332 CREECH Jas 513-621-9886
THORNELL Barry 513-721-3513 8
ZEISLER Andrew 513-621-9886 8
1334 ●SMUTZ Brooks 513-421-5278
1336 XXXX OO
X 14TH E
1341 ●BRANDT Chas H 513-381-7877
1342 ●DOWNTON Chas E 3D 513-784-9494 9
●DOWNTON Meredith 513-784-9494 9
1343 ●JACOBSON S 513-381-1291 8
1344 ●TARBELL B 513-665-4455 +2
1345 CALHOUN Jas 513-421-5164 9
●DELUCO Joe 513-421-5163
DIETZ J 513-421-8044 1
1346 ●DURHAM Harriet 513-241-4411
1347 XXXX OO
1349 ●VONTZ Albert OO 8
1351 HENDRICKS Richard John 513-241-3414 +2
HOPPE Tobi 513-333-0411 +2
●SASSER William OO 1
1353 ●FITZGERALD Timothy J 513-621-8267 6
X LIBERTY E
1601 MEYERS Jennifer R 513-241-8886 +2
1603 GREEN Patricia 513-684-9295 +2
1605 HUTCHINSON K 513-651-9235 5
MOORE Marcus 513-929-4705 +2
1606 COLEMAN Brenda 513-421-0946 9
FREELAND Wm 513-684-0989 1
HARRISON Warren 513-421-4124
★LITTLE ROCK CHURCH GOD&CHRIST 513-651-9533 7
1607 ...... APARTMENTS
DEVINNEY Gordon N 513-784-1820 6
IMWALLE Stephen 513-241-3404 +2
LOWRY Victoria L 513-723-0847 +2
●MARCHAL Michael OO 1
1 POTTS Jonathan K 513-579-8536 0
1607 ....
1609 BONILLA Fabian 513-651-1491 +2
HALE Kelly R 513-369-0220 +2
1611 XXXX OO
1612 ●SCHNELL Glenn OO 9
WILKE A J 513-241-3989 +2
1614 ●WHEDON John 513-721-1922 7
1615 ●FIELDS Frank B 513-421-1615
1617 ●MATSON Ron J 513-721-4161
YOUNG Danl W 513-721-4161
1619 ●SASSER William OO 1
1620 SWEIMLER Keri 513-784-9206 +2
X MILTON
★ 32 BUS 201 RES 59 NEW

BROADWAY 45103 BATAVIA OH

WEALTH CODE 2 0

115 - 133
155 - 370
BATAVIA VILLAGE
BATAVIA LSD
148 - 148
LOVELAND CITY
LOVELAND CSD

BROADWAY 45103 CONT
100 BALLINGER Jackie 513-735-2591 9
KESTEL Susan 513-735-2911 +2
X RIVERSIDE DR S
115 ●GALLIMORE Bernadette 513-732-6701
●GALLIMORE Roger E 513-732-6701
133 ●BARNHART Mark OO 1
148 ●NUNN Earl OO 0
150 DRESEL Jas 513-735-9119 +2
155 ●WILSON Bert 513-735-9735 1
160 ●DIXON Johnetta OO +2
175 ●SCOTT S D 513-735-6156 +2
180 ●MILLER Robert OO 8
WHITAKER Marshall 513-732-6654
189 ★TRANS AMERICA INTELLITECH 513-735-6411 0
●TULLY Tim 513-735-9881 0
●TULLY Tonya 513-735-9881 0
190 ●MURPHY Frank OO 0
X 2ND S
210 CASH L N 513-732-1795 9
●ELLIS Thomas OO +2
215 ★BATAVIA PUBLIC SC 513-732-0780 9
★SC BATAVIA ELEM 513-732-0780 5
220 ●RUNCK Chas S 513-732-1712 0
X MARKET S
260 ●WALVOORD Linda R 513-735-2332 0
275 ●SHELTON Johny 513-732-6381
280 ●AVERY Bonfrese OO 1
HEADEN Chanel 513-732-6473 1
285 ●COURTS Donna OO 9
X 3RD S
299 ●BEVINS Karen 513-732-6364 8
BEVINS Karen Chld 513-732-6622 5
302 XXXX OO
313 XXXX OO
325 BERNARD Dean 513-732-6539 9
●NAEGEL Kimberly OO 9
X VICTORIA
326 ★CLERMONT CO PUBLIC LIBRARY ADM 513-732-2736 9
330 XXXX OO
340 ●SMITH Stephen OO 8
350 ●YOUNG Joyce OO 9
370 ●OGLETREE Ronald 513-732-3055 1
★ 4 BUS 33 RES 5 NEW

BROADWAY 45140 LOVELAND OH

WEALTH CODE 3 8

100 - 422
LOVELAND CITY
LOVELAND CSD

100 ●BAUER David G 513-683-7898 6
104 SCHEWE L 513-677-5263 5
105 XXXX OO
110 XXXX OO
X 2ND S
128 COOPER Barbara R 513-583-7649 +2
★UNITD SPIRITUALISTS 513-683-4926 1
131 XXXX OO
141 XXXX OO
148 XXXX OO
150 ●LUNSFORD Donald OO 9
X HANNA AV
205 ●MCCOY Harvey 513-683-6442
209 XXXX OO
210 ●SPRINGER Walter E 513-683-4254 4
219 XXXX OO
257 XXXX OO
258 XXXX OO
263 ●ELLIS M A 513-683-2379
●ELLIS Stephen 513-683-5257 5
267 XXXX OO
319 ●WILLIAMS William OO 9
325 FOOTE Jacquelyn 513-774-7782 +2
●KROEGER Donald 513-683-5611
●KROEGER Myra 513-683-5611
333 ...... APARTMENTS
BOWMAN Bonnie 513-677-3927 +2
7 BURNETT K 513-697-9833 1
3 DANIELS Steve F 513-677-1125 1
1 DUSING C 513-697-8270 8
KEITH Aladdin 513-697-6089 9
KEITH Cinda 513-697-6089 9
9 MCCANE Ted Jr 513-774-7325 +2
12 MINAUF Christine 513-677-0912 1
6 POINTS V M 513-677-2148 4
2 REUSS Cindy S 513-677-1056
333 ....
336 XXXX OO
342 ●SILVER Dan OO 8
343 ●BAO M Y 513-697-9913 ⊕ +2
346 ●SCHEBOR Chas 513-677-2273 ♦
●SCHEBOR Constance 513-677-2273 ♦
347 ●BOLIN Jeffrey 513-697-0726 8
350 BARBOUR Stephanie M 513-774-7242 +2
MUDD Wm E 513-683-8572
SCHUMACHER C 513-583-1594 0
WADE Gene 513-774-9372 1
387 HOCTOR Wm 513-697-7603 1
HOLLINGSWORTH Brian 513-683-3333 7
MCBRAYER Chas 513-583-9214 +2
MONHOLLEN Glenn 513-697-6370 +2
X WAKEFIELD AV
401 ●MCNESS Irvin OO +2
402 ●MOREY A W 513-677-0037
405 ●HAMILL Alex 513-683-0578
●HAMILL Rebecca 513-683-0578
418 ●ROLKE David OO +2
419 ●WILSON Ellen OO +2
422 ●HOLDEN Sandra K 513-683-2147
WOLFF Vicki 513-683-4012 6
X WILLIAMS
NO # ★BIBLE BELIEVERS BAPT CHURCH 513-683-4148 8
★ 2 BUS 54 RES 11 NEW

BROADWAY 45039 MAINEVILLE OH

WEALTH CODE 8 0

140 - 500
HAMILTON TWP
LITTLE MIAMI LSD

140 ●BURNS Diana 513-677-5140
●BURNS Rob 513-677-5140
X MULBERRY
208 ●SNIDER Stanley 513-683-4834
246 ●ROOSA Mark OO 9
257 ●MCKEEHAN Kevin 513-683-9098
●MCKEEHAN Lynn 513-683-9098
272 ●BISHOP Kevin OO 9

BROADWAY 45039 CONT
WOLF Jean 513-677-5463 +2
282 ●MCCLAIN James OO 9
291 ●DAVENPORT Alvis 513-677-3407
X SYCAMORE
346 XXXX OO
353 ●BARTLETT Wallace 513-683-6182
354 ●HUNTLEY Eiko T 513-774-7449 1
377 ●KROENER Rhonda 513-677-2198 5
●KROENER Stan 513-677-2198 5
390 ●WALLACE Brian OO 8
391 ●GHEEN Ernest 513-677-5182 6
400 ●ROBINSON Brad OO 9
415 ●CORNETT Michael OO 9
WIBBELS R J 513-677-0896
420 CORNETT D G 513-683-8255
●WIBBELS Robert OO 9
437 ●AUSTIN Lynette OO 0
455 ●SMITH Jack B 513-683-7130
471 ●URTON Dani 513-683-3532
489 ●WILSON Karen OO 9
490 SCHUCHART Jim 513-677-9132 +2
●URTON Daniel OO 1
500 KOLLSTEDT Susan 513-677-0989 ⊕ +2
●LANE Vera OO 9
★ 0 BUS 30 RES 3 NEW

BROADWAY 45144 MANCHESTER OH

23 GROOMS J 937-549-1788
28 LAYNE Hazel 937-549-3816
200 ROSS Jack 937-549-3596
202 MCGRAW Charles 937-549-3253
205 EDGINGTON Jerry 937-549-8634
206 STRUNK Jeff 937-549-3349
301 REED P J 937-549-3338
502 ●CARTER Ethel R 937-549-3852
508 WINANT William Mrs 937-549-3171
510 MOON Janet 937-549-2507 ♦
511 CREAMER Patricia 937-549-2756
604 CARTER Don 937-549-2005
607 CARTER Herman 937-549-3122
611 RIGDON Teri 937-549-8287
704 FRYE Frank 937-549-3594
706 ●BOWMAN Victor 937-549-3691
708 BUTTS Jerry 937-549-3166
BUTTS Maureen 937-549-3166
711 ●BLYTHE Garnet 937-549-2458
713 JONES Evelyn 937-549-2751
JONES Kelly 937-549-2412
806 HATFIELD Jerry 937-549-3791
★ 0 BUS 22 RES 0 NEW

BROADWAY 45153 MOSCOW OH

WEALTH CODE 2.0

81 - 116
MOSCOW VILLAGE
NEW RICHMOND EVSD

1 XXXX OO
2 NIEHOFF L 513-553-4047 0
81 ●SKEENE Dennis C 513-553-6144 6
82 ●WEST Larry 513-553-3971
83 ●BECKLER Louis W 513-553-4050
84 BRILL Edwin L 513-553-4422
●BRILL Gail D 513-553-4422
86 ●BONHAM David 513-553-2575 0
87 ●HOGAN Richard OO 8
88 ●CARTER Linda 513-553-3994
CARTER Wm 513-553-3994
89 ●LAVELY Jeffrey 513-553-2610 7
90 ★MOSCOW CHURCH OF GOD 513-553-1100 +2
91 ●POLLARD Virgil E 513-553-6340
92 NICOLACI T L 513-553-7627 ♦ 0
93 FREE Laura 513-553-2142 6
FREE Rick 513-553-2142 6
●RICKETT Robert OO 9
94 ●FISCHER Marilyn OO 9
96 ●MARTIN Bill 513-553-0222
99 ●HANSELMAN Mic 513-553-9797
●HANSELMAN Rick 513-553-9797
100 XXXX OO
101 HENDRICKS T L 513-553-6489 9
104 O'Neill Richard M 513-553-3022 8
106 ●MOORE Gary OO 9
POE Rodney 513-553-1322 +2
SHRIVER J 513-553-1224 1
107 ●KAPPES George OO +2
110 XXXX OO
111 ★POST OFFICES 513-553-3223 1
★US POSTAL SERV OH ASC MOSCOW 513-553-3223 7
112 ★RIVER EDGE PUB 513-553-2703 5
115 ●BEASLEY Rick 513-553-3517
116 ●DALE Vicky L 513-553-1313 0
200 XXXX OO
★ 4 BUS 32 RES 3 NEW

BROADWAY 45679 SEAMAN OH

26 CARROLL Denver Mrs 937-386-2171
33 SHELBY Evelyn 937-386-2327
40 GROOMS Wilbur 937-386-2148
56 CURRENT Pam 937-386-2337
63 ★SEAMAN UNITED METHODIST CHURCH 937-386-2467
66 BUTTS Steve 937-386-2139
76 YOUNG James K 937-386-2193
83½ SHUPERT Gerald 937-386-2271
100 GARRISON Shannon 937-386-2804
101 YOUNG Harold W 937-386-2459
116 CHILDERS Billy Jr 937-386-2834
CHILDERS Marie 937-386-2834
130 HUMPHREY Holly 937-386-0812
141 BARRETT Ernest L 937-386-2520
146 HILL Mark 937-386-2675
181 SILCOTT Nancy 937-386-2210
191 RICHENDOLLAR Richard 937-386-1052
200 GINN Jerry E 937-386-2152
209 JOHNSON Kenneth Rev 937-386-2467
JOHNSON Rev 937-386-3372
213 CAMPBELL Green 937-386-2544
223 CAMPBELL Teri 937-386-3326
234 STERN Cecil 937-386-2976
247 ●ZIMMERMAN D B 937-386-2543
287 GROOMS Sam 937-386-2978
300 ★SEAMAN CHURCH OF CHRIST 937-386-3251
320 FETTERS Leonard M 937-386-2828

BROADWAY 45679 CONT
330 SINGLETON Harry Jr 937-386-2079
355 ★NORTH ADAMS SC ELEMENTARY 937-386-2516
★SC OH VLY NORTH ADAMS ELEM 937-386-2516
380 COOK W J 937-386-2330
500 HORD Paul 937-386-2606
★ 4 BUS 28 RES 0 NEW

BROADWAY E 45140 LOVELAND OH

WEALTH CODE 3 8

104 - 285
LOVELAND CITY
LOVELAND CSD

X STATE S
102 ★TRUE HOLINESS CHURCH OF GOD 513-683-1226 6
104 ●CRUTCHFIELD Joan OO 9
105 XXXX OO
110B BENTLEY P 513-697-0060 1
110 ★HOLE IN THE WALL ANTIQUES 513-683-7319 3
●SCHMIDT Louis OO 9
117 XXXX OO
128 SPARKS Dewey 513-677-9552 +2
131 ★NISBET LUMBER&HARDWARE 513-683-0380
139 ●LEE Buster 513-683-4578
LEE Kelly 513-774-7943 +2
141 ●TOBIAS Mary 513-683-4588
●TOBIAS Tim 513-683-4588
148 BOWATER Jonathan 513-583-5416 +2
HORTONSANDMAYR Patricia L 513-697-8371 8
150 ...... APARTMENTS
HALL Janet 513-774-8406 +2
HATFIELD David 513-774-7236 +2
23 HOWINGTON Dianna 513-774-9913 1
HOWINGTON J 513-774-7455 1
MARSH Jeff 513-697-1923 +2
2 MILLER Daniel 513-774-9590 1
19 PORTER David 513-774-7619 +2
150 ....
X WALNUT S
205 XXXX OO
207 ●KALTENHAUSER J M 513-774-8030 0
X MILL
209 ●SHURTS Diane OO 8
211 ●KALTENHAUSER John F 513-683-1276
250 MELVIN Dan 513-677-3530 0
●MELVIN Diane 513-677-3530 0
254 ●ROSS J D 513-683-8724
ROSS Laurie 513-683-8724
255 ●ERBELE Frank 513-683-2459
258 COLLINS A 513-677-0567 8
●HAINES Bob OO 9
261 ●OSBORNE Atheline OO +2
262 ●STEVENS Wayne 513-683-6692 8
264 ●SMITH Yuletide 513-683-2061
267 ●LINZ C 513-677-5407
273 ●KESSLER Bob 513-683-7527 ⊕
●KESSLER Cindy 513-683-7527 ⊕
★KESSLER STUDIOS 513-683-7500 ⊕
285 ●LAY Gary OO 9
SHOPE Rebecca 513-677-3064 +2
X SYCAMORE S
321 ●WILLIAMS W Woodrow 513-677-0924
333 FANNIN Wendy 513-683-7409 1
YOUNG D A 513-683-8238
336 ●ORR Derek W 513-677-1805 7
X VINE S
★ 4 BUS 42 RES 9 NEW

BROADWAY N 45160 OWENSVILLE OH

WEALTH CODE 7 0

175 - 309
OWENSVILLE VILLAGE
CLERMONT-NORTHEASTERN LSD

110 XXXX OO
135 TURNER Karen 513-732-2696 +2
175 ●MASON Amy 513-735-6770 +2
MASON Kevin 513-735-6770 +2
185 ●BURRIS Carl OO 9
MCDEVITT Danl J 513-732-3342 8
190 ●ALTER Karl OO 9
PERRY Carol 513-732-0551
PERRY Jas 513-732-0551
201 ●BOSCH Jos J 513-732-0170 9
210 PEAKER Jas N Rev 513-732-2218
★ST LOUIS CHURCH 513-732-2218 9
215 ●RILEY Peggy 513-732-5842 4
235 ●LAMMERS B 513-732-1569
250 ★SC ST LOUIS 513-732-0636
★ST LOUIS CHURCH CAFETERIA 513-732-2580 9
★ST LOUIS CHURCH SCHOOL 513-732-0636 9
★ST LOUIS SC 513-732-0657 0
255 HILAND Gerard P 513-732-0649 +2
265 ●GRAF Gary OO +2
273 BAUER Michael 513-732-3691 9
BAUER Michael Chld 513-732-3690 8
275 XXXX OO
302 ●DURBIN Josh 513-732-6115 0
●DURBIN Tara 513-732-6115 0
305 ●PLAZARIN Charles OO 9
309 NELSON Sophia Stringer 513-735-6643 1
●SIBERT Earl OO 0
313 PAINTER Melinda 513-735-2993 0
X JOHNS W
419 XXXX OO
X ORCHARD VIEW LN
★ 5 BUS 25 RES 5 NEW

BROADWAY N 45176 WILLIAMSBURG OH

WEALTH CODE 1.6

112 - 271
WILLIAMSBURG VILLAGE
WILLIAMSBURG LSD

X MAIN W
112 ●SMITH Leslie 513-724-1057
117 ●ADAMS Chester OO 9
127 ●DALTON James OO 8

BROADWAY N 45176 CONT.
136 MOORE Marshalynn 513-724-8661 0
●MOORE Volney OO +2
137 ●BOOTH Janet 513-724-1121 1
161 ●SCHWEICKERT Robert OO 1
WELLS E 513-724-6314 1
164 ●PARK David 513-724-7371 ♦
●PARK David 513-724-6239 1
WOOD Kimberly 513-724-7376 0
182 SIMS Danny 513-724-2433 5
●STORER Daniel OO 9
X GAY
214 XXXX OO
221 ●FORD Charlene 513-724-5532
●FORD Lawrence 513-724-5532
224 ●STORER Daniel OO 9
234 ●LUDWICK Judith 513-724-2004 5
●LUDWICK Wm 513-724-2004 5
235 ●SMITH Larry 513-724-7686 0
251 ●TAYLOR Shelby OO 8
261 ●HORTON J 513-724-7299 1
262 ●PARTIN Genetta 513-724-7769 7
271 ●WOLFE Kenneth OO +2
★ 0 BUS 24 RES 2 NEW

BROADWAY S 45160 OWENSVILLE OH

WEALTH CODE 7 0

115 - 444
OWENSVILLE VILLAGE
CLERMONT-NORTHEASTERN LSD

115 MATHIS Michael F Jr 513-735-6724 1
SCHUSTER B M 513-735-6184 0
125 XXXX OO
127 XXXX OO
145 ●SAUNDERS Milton L 513-732-0281
162 XXXX OO
165 XXXX OO
202 XXXX OO
203 ●MATHEWS John L 513-732-1411
MATHEWS John L Chld 513-732-1494
210 XXXX OO
216 ●SHIPLEY Shirley 513-732-0081 ♦
●SHIPLEY Walter 513-732-0081 ♦
222 ●CARNEY M T 513-732-9410 9
235 XXXX OO
250 XXXX OO
302 ●ALLEN S J 513-732-3152 0
306 ALLEN Chris 513-735-0770 +2
●BEHLER Daniel OO +2
SINGLER Jas 513-735-6841 +2
307 ●MALLALEY Marvin Jr 513-732-9212
★OWENSVILLE ARTS&ANTIQUES 513-732-1177 9
310 ●MAYNARD H 513-735-0450 +2
314 ●ISON Alton OO 9
318 ●MONROE Debbie A 513-735-6673 0
●MONROE Jim A 513-735-6673 0
319 XXXX OO
410 GAUCHE Stanley E 513-732-0135
414 ●PERRY Glen OO 9
★PERRY MICHAEL LANDSCAPING 513-732-1555
416 XXXX OO
419 XXXX OO
421 XXXX OO
425 ●STRUNK Lourene 513-735-6501 +2
427 XXXX OO
431 ●CAUDILL Mark OO 1
434 ●ROBINSON Gary OO 1
435 XXXX OO
440 ●KEENAN Charles OO 9
WILSON B 513-732-9625
444 ●THORNBERRY Jerry 513-732-6293
445 MCHENRY Richard E 513-732-2745
475 ★STONELICK TOWNSHIP TRUSTEES 513-732-3299 9
NO # ★CLERMONT SC PRIMARY 513-732-0661 1
NO # ★CLERMONT SC TRANSPRTN OFC 513-732-3957 1
NO # ★SC CLERMONT PRIMARY 513-732-0661
★ 6 BUS 40 RES 5 NEW

BROADWAY S 45176 WILLIAMSBURG OH

WEALTH CODE 1 7

141 - 523
WILLIAMSBURG VILLAGE
WILLIAMSBURG LSD

X MAIN W
111 XXXX OO
117 PANGALLO Traci 513-724-8868 1
120 XXXX OO
141 ●FIELDS Ruth 513-724-3464
●FIELDS Walker 513-724-3464
157 ●STEINHAUS D 513-724-5653 1
177 XXXX OO
191 ●TUDOR Orville OO 8
X SPRING
201 XXXX OO
204 XXXX OO
205 ●MILLER Bob 513-724-7636
218 ●RAGSDALE K 513-724-6568 4
221 ●ROBERTS Lloyd OO +2
234 ●GUY Don OO +2
237B HAMILTON Bill 513-724-7368 0
237 ●HILL Wanda OO 9
238 XXXX OO
246 ●CARTER Timmy OO 0
PONTZ Dale 513-724-7138 4
252 ●LUNG Shirley 513-724-1935 +2
257 ●BRATER Joanne OO +2
BUCHER M H 513-724-2480 6
260 ●LUNG Ruth OO 8
271 VINING Jamie 513-724-1695 +2
WOLFE Wes 513-724-1695 +2
272 COOPER T M 513-724-3227 3
●OTTEN Howard OO 9
278 ●MEINHARDT Jeffrey OO +2
283 ●WEAVER Ora L 513-724-6330
286 ●KROGMANN Rita OO +2
292 ●CAMPBELL Darlene OO 9
293 ●MCCLELLAN Patricia 513-724-6385
X WILLOW
307 ●HETRICK Ralph C 513-724-6540
314 ●MILEWSKI Thomas OO 8
315 ●PROFITT Micheal 513-724-2432 1
325 ●WAITS Gary OO 9
335 ●COWDREY Wendell C 513-724-2000
338 ●KNAUER Chas 513-724-7890
●KNAUER Leona 513-724-7890
350 ●BAINUM Guy N 513-724-6553

..BROADWAY S 45176 CONT
360 ●GAUL Keith OO 9
X LYTLE AV
416 ●OSBORNE Kenneth 513-724-6244
434 ●ADAMS Chester 513-724-2997 0
437 ●BENDER Pete 513-724-7649
445 ●WHITEMAN Teresa 513-724-5353 0
455 ●LEWIS L R 513-724-6210
456 DITTO Dennis 513-724-7879
465 ●SEXTON Chas 513-724-7438
●SEXTON Ellamae 513-724-7438
473 ●APPLEGATE Jas 513-724-7835
481 ●OTTEN Michael G 513-724-3210 +2
482 ●COOK Ted OO 9
499 ●WOODRUFF T 513-724-8577 0
X CARR
507 ●PERKINS Eugene 513-724-7650
523 ●ACKELS Oran OO 9
★ 0 BUS 55 RES 9 NEW

BROADWELL RD 45244 CINCINNATI OH

WEALTH CODE 5 0

7968 - 8559
ANDERSON TWP
FOREST HILLS LSD

NEWTOWN OH AREA

7968 ●EVANS Doug OO 9
JONES Kirk 513-474-2124 9
7973 ●ARNOLD Stephen M 513-474-9209 5
8010 XXXX OO
8057 MCLAUGHLIN Douglas G 513-474-5917 ♦
●NEELEY Jeffrey OO 9
8067 BODLEY W J 513-474-6102 9
●NEELEY Michael OO 9
8121 ●AICHHOLZ C OO 9
8131 ●GIBBS Char 513-474-1572 ♦ 8
●GIBBS Randy 513-474-1572 ♦ 8
8139 ●LATHAM Robt L 513-474-1865 8
8155 ●BOWEN Robert OO 9
8161 ●STEWART Robert OO 9
X ROUND BOTTOM RD
8200 ★BWAY CORP 513-388-2200 +2
8311 XXXX OO
8330 XXXX OO
8331 XXXX OO
8361 ★INTERSTOP CORP 513-388-4445 9
★INTERTEC 513-474-5200 6
★NORTH AMER REFRCTRY 513-388-2100
8391 XXXX OO
8445 XXXX OO
8450 XXXX OO
8479 ★PAVESTONE CO 513-474-3783 7
8485 ★SENCO PRODS INC 513-388-2829 4
★SENCO PRODS INC 513-388-2000
8497 ●JOHNSTON J A 513-474-3197
8505 ●YOUNG Mike 513-474-9340 5
8517 TAYLOR Wm B 513-474-1077 6
8527 ●CLARK Donald OO +2
8537 ●BOETTGER John 513-474-9078
8549 ●PERKINS Bobby M 513-474-3361
8553 ●EDMONSON Wood Craig 513-474-7145 0
8555 ●CLARK John Jr 513-474-0930
8557 ●MENKE Bill 513-474-5039
●MENKE Jane 513-474-5039
8559 XXXX OO
X MOUNT CARMEL RD
★ 7 BUS 31 RES 2 NEW

BROERMAN AV 45217 CINCINNATI OH

WEALTH CODE 5 0

5117 - 5184
ST BERNARD
ST BERNARD-ELMWD PLC CSD

SAINT BERNARD OH AREA

X ROSS AV E
5117 ●NEWTON Tim V 513-242-6344
5119 ●SWOPE Jas 513-242-4945
5120 ...... APARTMENTS
BEGLEY Katie 513-242-7065 1
BROWN Wayne 513-242-5376 +2
4D DUBOSE Quintin L 513-641-4997 1
5C HAYES Rodney 513-242-9147 1
6B MANN Chadd 513-641-2107 0
MAST Clarence 513-242-2481 +2
MAYS B 513-641-4057 +2
SCOGGINS L M 513-641-4848 +2
1B TALAMANTES Simon 513-242-4700 0
3D WONSON Johnny 513-242-2780 0
4C YOUNG D L 513-242-6020 0
5120 ....
5121 HAZELBAKER Jerry A 513-242-8050 7
5122 ●HAUSFELD Ronald OO +2
5123 ●BEDINGHAUS Jeff 513-641-3823 +2
5124 ●HAUSFELD Mary Beth 513-242-9036
●HAUSFELD Ron 513-242-9036
X TENNIS LN
5125 CARROLL M C 513-242-8590 9
5128 ADAMS Guy 513-242-9013 +2
HELTON H W 513-242-6770
●MCMANUS Corrine OO 1
5129 ●DAHLING Dorothy E 513-242-5778
5130 ●HELLER Jas M 513-641-0192
5132 ●WILKING Robt 513-242-5745
5133 ●FUGIKAWA Geo T 513-242-0737
5136 CASTOR Voris L 513-242-4012
●SAMS Yvonne OO 0
5137 ●PRICE Ralph C 513-242-4176
5141 ●ROBERTS Dave 513-641-4437
X MOELLER AV
5145 ●VONDERMEULEN Elmer 513-242-5884
5146 ●DERRENKAMP Robt Jr 513-242-8022 6
SCHNATZ Nicholas J 513-641-2294 6
5148 ●HART Myron 513-242-4498
5149 ●CARTER Jos R 513-242-2726
5150 ●WONG Steve 513-641-4452 0
5153 ●WOODS Gary 513-641-3962
5157 ●VONWAHLDE Alvin E 513-242-4230
5161 ●GOANS Diane OO 8
POWELL Kenneth 513-242-0536
5162 ★CINTI FLOOR CO INC 513-641-4500
5165 ●YOUNG Max E 513-242-3299
5167 ●GROW Jas 513-641-5167 9
5170 ★SERVICE STEEL 513-242-6000
5172 XXXX OO
5173 ●HOLDEN Melody OO +2

♦=DO NOT CALL ⊕=DO NOT MAIL ⌀=DO NOT CALL OR MAIL

TP	Adjoining	Source
✓	✓	R. L. Polk Co.

BROADWELL RD 1995

Broadwell Ave *(CINCINNATI)* *(cont'd)*

Address	Name	Zip+4	CarrRt	Phone
3284	Eggerding Henry M	-6507	C083	662-0488
3285	Bockerstette Russ	-6504	C083	481-2570
3287	Feeback Wm	-6504	C083	481-5784
3291	Schube Harry P	-6504	C083	662-7407
3298	**BENTLEY MILLS INC**	-6507	C083	661-2281
3298	Morgan Larry	-6507	C083	481-6514
3298	Morgan S P	-6507	C083	481-6534
3299	Phelps Julie	-6504	C083	661-3893
3300	Blackburn Brian	-6509	C083	661-4317
3300	Ellis Karen L	-6509	C083	661-4317
3302	Schreiber D M	-6509	C083	481-5787
3304	Everman Ronald	-6509	C083	661-1612
3306	Essell Amor K	-6509	C083	662-1902
3309	Ginn John R	-6508	C083	661-7525
3311	Martin Robt C	-6508	C083	481-0780
3411	Aieta Vito	-6564	C085	661-2189
3411	Belew R	-6564	C085	661-0261
3411	Hagarty Colleen M	-6564	C085	662-1555
3411	Heman Howard H	-6564	C085	662-5640
3411	Kazmierski Michael P	-6564	C085	662-0470
3411	Klemish John & Virginia	-6564	C085	662-5236
3411	Lupascu Garofita	-6564	C085	481-7465
3411	Maret A	-6564	C085	662-3578
3411	Reichert Bill	-6564	C085	481-2799
3411	Reid Philip	-6564	C085	661-1906
3411	Shook Mark	-6564	C085	661-1359

RESIDENTS 42 BUSINESSES 1

Broadwell Rd *(CINCINNATI)* 45244

Address	Name	Zip+4	CarrRt	Phone
7968	Carr Larry J	-1602	C069	474-9592
7973	Arnold Stephen M	-1601	C069	474-9209
8057	McLaughlin Douglas G	-1603	C069	474-5917
8099	**MAIL PLUS**	-1603	C069	474-5951
8099	Weeks B S	-1603	C069	474-5951
8121	Aichholz Calvin	-1605	C069	474-3178
8139	Ogletree Kevin	-1605	C069	474-2322
8155	Weierman M	-1605	C069	474-4435
8200	**BALL CORP**	-1608	C069	388-2200
8333	**ANDERSON TOWNSHIP**	-1609	C069	474-3151
8361	**NORTH AMERICAN REFRACTORIES COMPANY**	-1609	C069	388-2100
8479	**INTERPAVE CORP UNI-STONE**	-1611	C069	474-3783
8479	**PAVERS UNI-STONE**	-1611	C069	474-3783
8479	**UNI-STONE**	-1611	C069	474-3783
8485	**SENCO PRODS INC**	-1611	C069	388-2000
8497	Johnston J A	-1611	C069	474-3197
8505	Young Larry M	-1613	C069	474-2857
8505	Young Mike	-1613	C069	474-9340
8537	Boettger John	-1613	C069	474-9078
8549	Perkins Bobby M	-1613	C069	474-3361
8553	Erwin John	-1613	C069	474-3690
8555	Clark John Jr	-1613	C069	474-0930
8557	Menke Bill & Jane	-1613	C069	474-5039
8749	**UNISTONE**			474-3783

RESIDENTS 15 BUSINESSES 9

Brocdorf Dr *(CINCINNATI)* 45215

Address	Name	Zip+4	CarrRt	Phone
163	Hollander Gary E	-4103	C086	948-8126
167	Pridonoff Eugene	-4103	C086	948-1367
171	Tepe Andrew C	-4103	C086	761-0125
175	Ziegler Jos & Penny	-4103	C086	821-3648
179	Neupauer John C	-4103	C086	761-4882
194	Kreuzmann J J	-4103	C086	821-3437
200	Tenney Robt & Zoe	-4105	C086	821-8061
202	Dippold R A	-4105	C086	821-9579
209	Magnotta Michael J	-4104	C086	761-2042
212	Peerless G	-4105	C086	821-7396
213	Balnes David	-4104	C086	761-3899
216	Schmid Peter A	-4105	C086	821-5416
218	Buell K	-4105	C086	821-4712
222	Tepper Emanuel	-4105	C086	761-2225
224	Papa Wm C	-4105	C086	761-4159
227	Hendricks Lamar & Beth	-4139	C086	821-7546
228	Purdy T & C	-4105	C086	761-8616
231	Hauser Donald	-4139	C086	821-9497
236	Kapernaros C L	-4105	C086	821-7049
237	Ritchey Michael G	-4139	C086	821-5513
359	Drake Richard L	-4106	C086	821-0611
360	Wood Frank	-4106	C086	821-6825
364	Young Eric	-4106	C086	948-9245
369	Alper J	-4106	C086	761-0504
372	Cochran Jas W	-4106	C086	761-3396

RESIDENTS 25

Brockton Dr *(CINCINNATI)* 45251

Address	Name	Zip+4	CarrRt	Phone
3586	Johnson B C	-2410	C049	385-8134
3592	Milliken E C	-2410	C049	385-7387
3592	**SYSTEMS VISION CONSLTG**	-2410	C049	385-3635
3593	Lipp M	-2409	C049	385-7649
3607	Rub Wm Thos Jr	-2411	C049	923-4406
3610	Garland Wm	-2412	C049	385-7272
3613	Swagart Jas E	-2411	C049	741-8862
3616	Krummen Ronald P	-2412	C049	385-7684
3619	Dickhaus John	-2411	C049	385-6824
3622	Wheeler Herbert Earl & Deborah	-2412	C049	385-5255
3625	Michel Danl	-2411	C049	741-2845
3631	Gebing Eugene F	-2411	C049	385-7023
3634	Goodale J	-2412	C049	385-7882
3646	Johnson M A	-2412	C049	385-6980
3652	Sheffel Donald D	-2412	C049	385-2101
3658	Engleman Howard G	-2412	C049	741-4570
3661	Kiefer Kenneth	-2455	C049	385-7801
3664	Lake E	-2412	C049	385-8928
3667	Formes Karl S	-2455	C049	385-7617
3673	Robinson J W	-2455	C049	385-5228
3676	Sander Edw R	-2412	C049	385-6916
3682	Martini Ronald	-2412	C049	385-3923
3685	Coombs Theresa & Kevin	-2455	C049	245-9456
3688	Urso Benj	-2412	C049	385-8127
3691	Schlachter J A	-2455	C049	385-8367
3697	Stewart Janet L	-2455	C049	385-0165
3697	Sunders C	-2455	C049	385-3645
3699	Mullins Ralph J	-2455	C049	385-9267
3703	Robbins Jas J Jr	-2413	C049	385-8165
3706	Mattingly Jos & Demarus	-2407	C049	385-7164
3707	Mieling John A	-2413	C049	385-6173
3711	Sizer Wm Leo	-2413	C049	385-6296
3719	Kruthaupt Ron	-2413	C049	385-3630
3734	Miramont R C	-2407	C049	385-8339
3735	Harrison Wm	-2413	C049	385-2323
3742	Reardon Bruce	-2407	C049	741-8093
3745	Inderhees H Norman	-2413	C049	385-9468
3750	Bierman Jack	-2407	C049	385-9739

Brockton Dr *(CINCINNATI)* *(cont'd)*

Address	Name	Zip+4	CarrRt	Phone
3767	Wilson Edwin C	-2413	C049	385-7219
3768	Dick J M	-2407	C049	385-7093
3786	Taylor Carroll	-2407	C049	385-3217
3870	Shah Nalin B	-2910	C042	385-2920
3890	McNanie Jas B	-2910	C042	923-3556
3900	Durkin Mike J	-2933	C042	741-3739
3918	Moser Mike & Melanie	-2933	C042	741-7313
3924	Vehr Eric J	-2933	C042	245-0546
3925	Trimble Gary	-2934	C042	923-3276
3954	Thatcher Dale	-2933	C042	245-0792
3984	**DREES COMPANY THE**	-2933	C042	385-4765

RESIDENTS 47 BUSINESSES 2

Brockton Dr *(FAIRFIELD)* 45014

Address	Name	Zip+4	CarrRt	Phone
2204	Reichardt Gene F	-3848	C071	829-0660
2218	Bohler Thos P	-3848	C071	829-3755
2221	Best John S	-3847	C071	829-0272
2230	Postell Kenneth R	-3848	C071	829-5818
2233	Royer Richard K & Shirley	-3847	C071	829-0191
2238	Spaeth Keith M	-3848	C071	829-6619
2238	Spaeth Keith M Lwyr	-3848	C071	829-6619
2245	Payne Robt A	-3847	C071	829-2014
2246	Larbes Bob & Judy	-3848	C071	829-6201

RESIDENTS 9

Broerman Ave *(CINCINNATI)* 45217

Address	Name	Zip+4	CarrRt	Phone
5117	Newton Tim V	-1111	C072	242-6344
5119	Swope Jas	-1111	C072	242-4945
5120	Holden Leslie T	-1150	C072	242-5189
5120	Maughmer Natasha	-1150	C072	641-2348
5120	Sandman G R	-1150	C072	242-2701
5120	Slone Carol A	-1150	C072	242-8029
5120	Smith Christopher	-1150	C072	242-3583
5120	Tirado Hermes	-1150	C072	242-3479
5120	Weitz Mark T	-1150	C072	242-6208
5120	Young Joyce	-1150	C072	242-3626
5123	Singleton Steve & Teri	-1111	C072	641-3656
5124	Hausfeld Ron & Mary Beth	-1144	C072	242-9036
5125	Bedinghaus Gerald L	-1111	C072	641-4756
5128	Adams Guy	-1144	C072	641-5354
5128	Helton H W	-1144	C072	242-6770
5129	Dahling Dorothy E	-1145	C072	242-5778
5130	Heller Jas M	-1144	C072	641-0192
5132	Wilking Robt	-1144	C072	242-5745
5136	Castor Voris L	-1144	C072	242-4012
5141	Geeding Leona	-1145	C072	641-0877
5141	Roberts Dave	-1145	C072	641-4437
5148	Hart Myron	-1140	C072	242-4498
5149	Carter Jos R	-1145	C072	242-2726
5150	Wong C M	-1140	C072	641-4452
5153	Woods Gary	-1145	C072	641-3962
5157	Vonwahlde Alvin E	-1145	C072	242-4230
5161	Powell Kenneth	-1145	C072	242-0536
5162	**CINTI FLOOR CO INC**	-1140	C072	641-4500
5165	Young Max E	-1145	C072	242-3299
5170	**SERVICE STEEL**	-1140	C072	242-6000
5172	**4 X 4 PULLING BALL INC**	-1140	C072	641-3344
5172	**METRO ELEC INC**	-1140	C072	242-0553
5177	Booth B A	-1145	C072	641-0277
5178	**MORSCO MACHINERY SERV**	-1140	C072	242-7179
5180	**CINTI READY MIX CONCRETE**	-1140	C072	242-7526
5181	Meale A	-1145	C072	242-4894
5183	Meale A J	-1145	C072	641-2237
5200	**DELTA TRANSFORMER CO**	-1181	C072	242-9400

RESIDENTS 31 BUSINESSES 7

Brofield Dr *(HAMILTON)* 45011

Address	Name	Zip+4	CarrRt	Phone
6033	Dyer R	-5154	C029	896-4749
6038	Lindquist Tim & Kim	-5149	C029	844-8427
6050	Oler Alan	-5149	C029	896-5052
6051	Stapleton Phillip M	-5154	C029	856-9429
6061	Kuhn Jas & Sid	-5154	C029	867-9716
6081	Bentley J G	-5154	C029	867-0124
6087	Norfleet Austin	-5154	C029	887-2184
6095	Bertsche David	-5154	C029	844-6137
6100	White Gary L	-5180	C029	896-4764
6103	Edds Michael	-5182	C029	844-8492
6117	Braswell Danny	-5182	C029	844-6203
6127	Dinsmore Dwight	-5182	C029	867-1202
6136	Sharpshair P A	-5180	C029	844-8185
6137	Wolgast Gerald	-5182	C029	887-0376
6142	Teague M & L	-5180	C029	868-0193
6145	Adleta Laura	-5182	C029	896-7553
6145	Adleta Rick & Laura	-5182	C029	896-1403
6156	Barrows Kevin & Patti	-5180	C029	863-8923
6157	Schauer Stephen	-5182	C029	887-7028
6167	Bishop Glen	-5182	C029	896-4545
6176	May Shirley	-5180	C029	868-1970
6177	Vandeneynden Jim & Kate	-5182	C029	844-6234
6187	Collins Ben & Krista	-5182	C029	844-6674
6188	Pack Jeffrey	-5180	C029	844-2866
6197	Kraus Dick	-5182	C029	856-7145
6207	McConnell T	-5183	C029	868-1961
6217	Rorer David & Vivian	-5183	C029	863-6602

RESIDENTS 27

Brokaw Ave *(CINCINNATI)* 45225

Address	Name	Zip+4	CarrRt	Phone
2324	Johnson Tommy	-1106	C021	662-7544
2341	Bourn Harold	-1105	C021	481-4620
2346	Carpenter Saml	-1106	C021	481-2309
2349	Harmon W B	-1105	C021	662-3579
2354	Bauer D J	-1106	C021	662-4795
2364	Freytag Edw	-1106	C021	661-2589
2383	Fahey Thos	-1105	C021	662-4775
2384	McMillan Paul	-1106	C021	662-3514
2387	Scheidler R Scott	-1105	C021	661-2410
2395	Paul Edw G	-1105	C021	662-8406
2400	**DECORATIVE RESTORATIONS**	-1108	C021	481-9338

RESIDENTS 10 BUSINESSES 1

Brokensound Ln *(CINCINNATI)* 45242

Address	Name	Zip+4	CarrRt	Phone
9150	McKenna Lori A	-4657	C025	792-9646

RESIDENTS 1

Bromley Crescent Sprg Rd *(COVINGTON)* 41017

Address	Name	Zip+4	CarrRt	Phone
	Weiss T			331-5691
692	Clark G C	-3803	C074	581-4551
693	Black J A	-3804	C074	291-4675
693	**CORKY MOORE CONTRG**	-3804	C074	581-3675

Bromley Crescent Sprg Rd *(COVINGTON)* *(cont'd)*

Address	Name	Zip+4	CarrRt	Phone
693	Moore Geo Corky	-3804	C074	581-7185
701	Moore Chas	-3739	C074	291-5659
717	Lewis Jas R	-3739	C074	341-2285
717	Lewis John J	-3739	C074	344-8796
719	Baker Mary A	-3740	C074	578-0512
719	Hampson H	-3740	C074	344-1799
719	Howard Bert	-3740	C074	331-6984
719	Phillips Wm	-3740	C074	331-2230
719	Smith Gregory	-3740	C074	331-6592
719	Wallace Geo	-3740	C074	341-1640
719	Weiss J	-3740	C074	341-7766
719	Woody Alex	-3740	C074	344-0318
719	Woody Marcella	-3740	C074	341-9367
728	Bahr Thos Curt	-3738	C074	341-8695
760	Tomlinson Thos R	-3738	C074	331-4616
771	Reinhart Harold C	-3739	C074	331-1189
772	Schneider Gerald E	-3738	C074	331-2829
784	Kruse Margaret	-3738	C074	331-7604
790	Ahlers Bill	-3738	C074	331-9018
792	Schaffer Frank	-3738	C074	331-1847
794	Harrell Fred W Jr	-3738	C074	331-6827
796	Labare Fred A	-3738	C074	331-2781
799	Harman Ruby	-3739	C074	331-3082
2101	Watkins C	-3813	C074	331-2216
2133	Huffman David O	-3813	C074	331-5314
2158	Remley S	-3813	C074	344-9316
2244	Dunagan Carl			331-4639

RESIDENTS 30 BUSINESSES 1

Bromley Rd *(BRUMLEY)*

Address	Name	Phone
607	Collins Ronald	291-2692
607	Lawson Anthony J	581-3982
607	Wren Robt	581-9736
635	Schneider Phillip	581-7733
657	Foulks Chas	291-7215

RESIDENTS 5

Bromley Rd *(COVINGTON)* 41017

Address	Name	Phone
607	Ames Elizabeth	431-5548
607	Hammons Leo	491-2809
607	Hatfield Mark L	431-1050
641	Wartman Frank Jr	491-9051
667	Moore Brian K	491-6256

RESIDENTS 5

Brompton Ln *(CINCINNATI)* 45218

Address	Name	Zip+4	CarrRt	Phone
1	Dillenburger Phillip F	-1314	C071	825-4210
2	Donohue Peter	-1314	C071	825-9766
6	Wolke Stephen	-1314	C071	825-0590
7	Hagedorn Wm H	-1314	C071	825-4226
8	Kuhn Fred J Jr	-1314	C071	825-6541
9	Willis Francis H	-1314	C071	825-1758
10	Wolke H A	-1314	C071	825-1207
11	Gallagher L B	-1314	C071	851-9853
12	Hooper Wm	-1314	C071	825-7687
13	Swallow G & S	-1314	C071	825-3060
14	Brandt Wm F	-1314	C071	825-1365
16	Ernst Irwin	-1314	C071	825-5087
17	Gentry Tim & Beth	-1314	C071	825-7719
18	Hill John C	-1314	C071	851-4266
21	Sansone Anthony J II	-1314	C071	825-6284
22	Hooper Jas C	-1314	C071	825-7843
23	Engelman Mary	-1314	C071	742-3162
24	Humbert Greg	-1314	C071	825-1343
25	Kamp Robt	-1314	C071	851-2999
28	Stankiewicz Allen	-1314	C071	825-1152
30	Lawlor T J	-1314	C071	825-2659
31	Allen Robt E Jr	-1314	C071	742-5542
32	Wernecke Henry F	-1314	C071	825-6077
33	Walkenhorst Richard M	-1314	C071	742-1541
34	Daumeyer Geo J	-1314	C071	825-4279
35	Gerard John E	-1314	C071	825-6755

RESIDENTS 26

Bromwell Ln *(CINCINNATI)* 45249

Address	Name	Zip+4	CarrRt	Phone
10856	Miller Chas M	-3610	C040	489-3422
10857	Gazdik John L	-3610	C040	489-2351
10862	Jinkinson H & K	-3610	C040	530-0403
10863	**PAUL HOMES INC**	-3610	C040	489-3939
10863	Paul Thos A	-3610	C040	489-3838
10868	Warner Victor D	-3610	C040	489-3397
10869	Patterson Robt L	-3610	C040	489-6133

RESIDENTS 6 BUSINESSES 1

Bromyard Ave *(CINCINNATI)* 45241

Address	Name	Zip+4	CarrRt	Phone
4325	Yan M J	-3681	C019	777-0397
4330	Miller SW Jr	-3609	C019	777-2351
4331	Alf Jas R	-3681	C019	777-8471
4338	Ullrich Jerald & Mary Lou	-3609	C019	779-2264
4341	McManus Chas G & Patricia L	-3681	C019	777-0023
4348	Quilty Scott	-3609	C019	779-8455
4377	Augat Wm	-3610	C019	779-3068
4388	Pride P S & S D	-3682	C019	755-0929
4389	Seger Mark J	-3610	C019	779-8775
4397	Hentges Wm J	-3610	C019	779-6516
4398	Coggin Jas C Jr	-3682	C019	779-1064
4407	Morris Jas	-3610	C019	779-8055
4412	Baker Mark J	-3682	C019	779-9984
4436	Galati Jas & Nancy	-3682	C019	777-4159
4437	Sykes Thos M	-3610	C019	755-2963
4455	Trivedi Alex & Nayana	-3610	C019	777-9670
4462	Petersen John M	-3682	C019	779-1049

RESIDENTS 17

Brook Knoll Dr *(WEST CHESTER)* 45069

Address	Name	Zip+4	CarrRt	Phone
8820	Busch Becky & Steve	-3272	R007	755-1664
8829	Martini Richard & Lynne	-3273	R007	779-7501
8839	McCormick Steven & Susan	-3273	R007	779-4553
8840	Dwertman Jos E	-3272	R007	779-7978
8849	Sommer Shirley	-3273	R007	779-4866
8850	Heenan Tim	-3272	R007	777-7733
8859	Herr Joene	-3273	R007	755-0927
8860	Conley L	-3272	R007	779-2339
8869	Watson Dennis	-3273	R007	777-0791
8870	Winstel Edw F	-3272	R007	777-2721
8879	Ransick Mark H	-3273	R007	777-0650
8880	Morabito Enzo	-3272	R007	777-9303
8889	Dopp Douglas A	-3273	R007	777-8273
8890	Sieber Wm P	-3272	R007	779-4260
8895	Furterer D	-3273	R007	779-2514
8896	Stiftar E J & B G	-3272	R007	779-2916

RESIDENTS 16

Brook Ct *(BATAVIA)* 45103

Address	Name	Phone
1519	Rowland Perry	753-5988
1521	Milam Jeffrey	752-4489
1522	Coyle Jas	753-7292
1526	Davenport Carl G	752-4187

RESIDENTS 4

Brook Ct *(FAIRFIELD)* 45014

Address	Name	Zip+4	CarrRt	Phone
825	Hassler Don L	-2707	C054	863-4677
830	Meeker Wm & Eileen	-2707	C054	867-0238
831	Lakes Bobby A	-2707	C054	868-2329
840	Bowling Willie B	-2707	C054	892-6628
841	Skillman D	-2707	C054	896-1208

RESIDENTS 5

E Brook Dr *(WEST CHESTER)* 45069

Address	Name	Phone
9441	Hamilton B J	777-6922
9447	Cebulskie Graham & Andy	777-8626
9447	King Walter & Sue	777-8626
9448	Owens J A	777-1894
9455	Edwards Karen & Larry	777-2676
9481	Steffen Brent & Kim	779-2731
9503	Rennegarbe Jas	777-3345
9506	Williams E A	777-9115
9511	**AWNINGS BY HAMEN**	779-0913
9511	Hamen John	777-8389
9563	Ulland Kerry	779-4256
9564	Nicely Paul C	777-3295

RESIDENTS 11 BUSINESSES 1

Brookbridge Dr *(CINCINNATI)* 45249

Address	Name	Zip+4	CarrRt	Phone
11102	Cook John & Marlene	-2261	C016	489-8268
11104	Miccoli Peter & Lisa	-2261	C016	530-9067
11105	Meyer Louis Jr & Lea	-2262	C016	489-1950
11111	Walker Dennis E & Beverly H	-2262	C016	489-3895
11122	Davis Michael B	-2261	C016	489-6601
11122	Kindberg B A	-2261	C016	247-0729
11173	Stark P	-2271	C016	489-4430
11176	Juran Steve	-2200	C016	489-3532
11205	Scherocman Jas A	-2267	C016	489-3338
11212	Sampson Dean R	-2201	C016	489-7286
11215	Ball Chas Rick	-2267	C016	489-8381
11220	Stouffer Richard H	-2201	C016	489-1663
11227	Cron Keith & Carol	-2267	C016	489-9076
11244	Bruns Edw C	-2201	C016	489-7303
11252	Meyer Jack Andrew	-2201	C016	489-7361
11260	Smalara Jerome S	-2201	C016	489-8089
11265	Niehaus Terry S	-2267	C016	469-0999
11265	Purdom Terry S	-2267	C016	530-0303
11266	Weyers Jas A & Jeanne	-2201	C016	489-7372
11271	Suidan Makram & Randa	-2267	C016	489-1230
11272	Driver Edw	-2201	C016	489-7308

RESIDENTS 21

Brookcrest Dr *(CINCINNATI)* 45237

Address	Name	Zip+4	CarrRt	Phone
1012	**CREW PLUMBING**			779-7391
7200	Burton Kenneth	-3426	C023	351-7342
7200	Fagan Wm E	-3426	C023	531-0039
7200	Keene M	-3426	C023	841-0190
7200	Shannon Stephen W	-3426	C023	631-7290
7213	Lucas Mildred	-3405	C023	631-3455
7213	Nowell B J	-3405	C023	841-0240
7221	Gray Rodney C	-3405	C023	631-5331
7221	Neal Ricardo	-3405	C023	631-2577
7225	Clark L	-3405	C023	841-0257
7229	Ward Elizabeth	-3405	C023	731-4972
7230	Tarver G W	-3449	C023	841-1292
7233	Kerber K	-3405	C023	631-2430
7233	Whitworth M K	-3405	C023	351-0836
7237	Ash Glenn D	-3405	C023	351-4756
7241	Itkoff Irvin R	-3405	C023	351-2250
7241	Kasee Jas L	-3405	C023	731-3696
7245	Lott E O	-3405	C023	531-5519
7246	Rivers Shepherd	-3449	C023	396-7419
7246	Tolbert Loretta R	-3449	C023	351-9687
7249	Wilking Steven	-3405	C023	351-8612
7253	Goldberg P	-3405	C023	396-6586
7253	Spitz Wm	-3405	C023	731-4345
7257	Doroshko Georgiy	-3405	C023	396-7650
7261	Landman P	-3405	C023	351-8308
7261	Moody R L	-3405	C023	631-6211
7265	Leher Morris J	-3405	C023	631-7516
7265	Weinstein Deborah Leher & Sanford L	-3405	C023	531-5063
7269	**SALKIND**	-3405	C023	351-3510
7269	**SALKIND ELEANOR INC**	-3405	C023	351-2510
7273	Bryant Alvin	-3405	C023	631-6804
7300	Wilson M	-3408	C023	631-4202
7301	Austin David J	-3407	C023	531-8560
7305	Larkin Shirley	-3407	C023	731-3042
7309	Atkinson D	-3407	C023	531-1650
7309	Ernst F J	-3407	C023	531-1650
7313	Jarson Saml	-3407	C023	351-0891
7313	Meier C J	-3407	C023	631-0592
7317	Green Margie A	-3407	C023	351-2628
7321	Arays Edmund	-3407	C023	351-3954
7321	Mezhvinsky Ronan	-3407	C023	531-2404
7325	Bortz Saml	-3407	C023	351-0715
7325	Kravitz Max	-3407	C023	351-0984
7329	Langford John E	-3407	C023	631-7829
7333	Trevathan B F	-3407	C023	351-5322
7337	Boulding A A	-3407	C023	631-8846
7337	Childs B	-3407	C023	731-8720
7341	Gibson Karl A Jr	-3407	C023	731-6780
7345	Dunsker Shiel	-3407	C023	531-7264
7345	Fegelman A	-3407	C023	731-8131
7350	Ackerman Stuart & Jenny	-3445	C023	731-4984
7357	**DENTECH**	-3407	C023	631-5400
7360	Palmer Carl & Janice	-3443	C023	631-3065
7360	Palmer Janice & Carl	-3443	C023	631-3065
7365	**JANE LEE'S HAIR FASHNS**	-3407	C023	631-5635
7365	**PRETTY AS A PICTURE**	-3407	C023	731-3647
7369	**MARTINELLI'S BARBER SHOP**	-3407	C023	351-7272
7373	**A VOICE-TEL**	-3407	C023	531-8200
7373	**A W STAMPS**	-3407	C023	631-4737
7373	**BECKER ROBT ENGRG GROUP INC**	-3407	C023	351-3355
7373	**BELL-MASSEY-KROL INC**	-3407	C023	531-2155
7373	**CENTER FOR MEDCL SERVICES**	-3407	C023	631-7315
7373	**FUTURE ENTERPRISE CO**	-3407	C023	396-7870
7373	**LORETTA'S CHANGES**	-3407	C023	631-5740

Senco
8450 Broadwell Road
Cincinnati, OH 45244

Inquiry Number: 3901204.9
April 07, 2014

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Date EDR Searched Historical Sources:

Aerial Photography April 07, 2014

Target Property:

8450 Broadwell Road

Cincinnati, OH 45244

Year	***Scale***	***Details***	***Source***
1938	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: January 01, 1938	EDR
1949	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: April 09, 1949	EDR
1952	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: January 01, 1952	EDR
1956	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: January 01, 1956	EDR
1962	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: January 01, 1962	EDR
1968	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: January 01, 1968	EDR
1975	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: January 01, 1975	EDR
1985	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: January 01, 1985	EDR
1988	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: January 01, 1988	EDR
1994	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Date: January 01, 1994	EDR
2001	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/DOQQ - acquisition dates: September 23, 2001	EDR
2005	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Year: 2005	EDR
2006	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Year: 2006	EDR
2009	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Year: 2009	EDR
2010	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Year: 2010	EDR
2011	Aerial Photograph. Scale: 1"=500'	Panel #: 39084-B3, Madeira, OH;/Flight Year: 2011	EDR

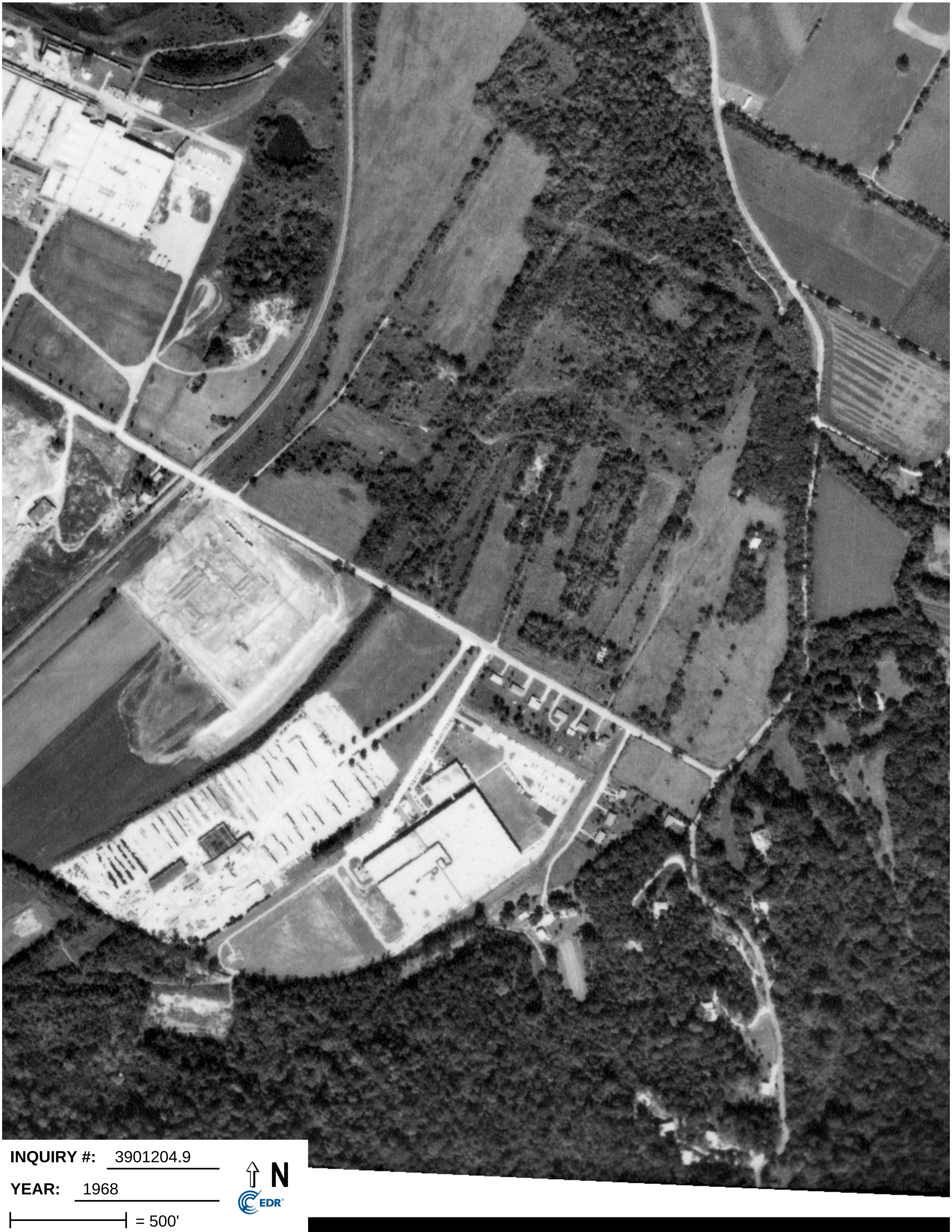
INQUIRY #: 3901204.9
YEAR: 1938
= 500'
N
EDR


INQUIRY #: 3901204.9
YEAR: 1949
= 500'
N
EDR


INQUIRY #: 3901204.9
YEAR: 1952
= 500'
N
EDR


INQUIRY #: 3901204.9
YEAR: 1956
= 500'
N
EDR


INQUIRY #: 3901204.9
YEAR: 1962
= 500'
N
EDR



INQUIRY #: 3901204.9

YEAR: 1968

= 500'

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EDR


INQUIRY #: 3901204.9
YEAR: 1975
= 500'
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EDR


INQUIRY #: 3901204.9
YEAR: 1985
= 500'
N
EDR

INQUIRY #: 3901204.9

YEAR: 1988

= 500'

N

EDR

INQUIRY #: 3901204.9

YEAR: 1994

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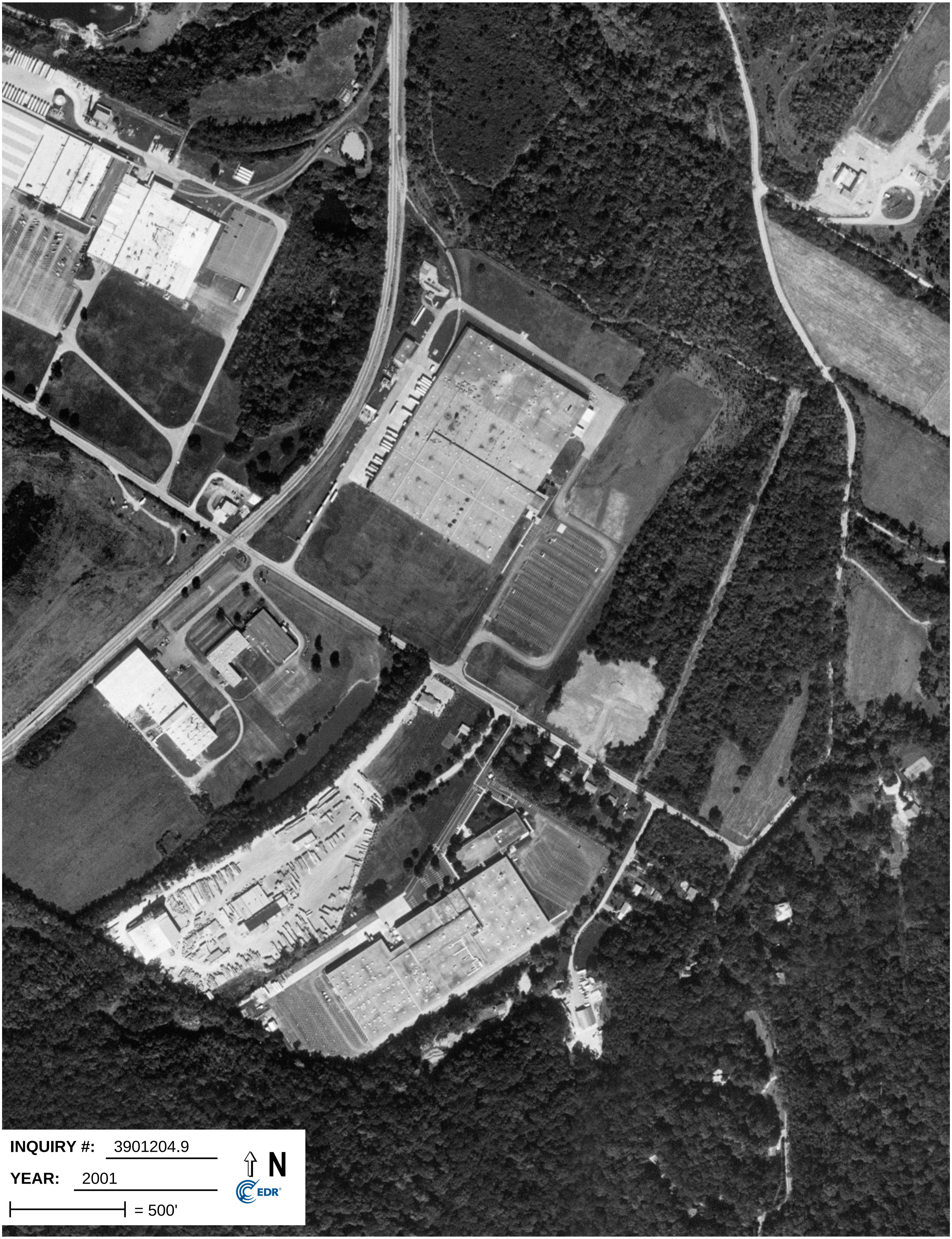
EDR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EDR


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EDR


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YEAR: 2006
= 500'
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EDR


INQUIRY #: 3901204.9
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YEAR: 2010
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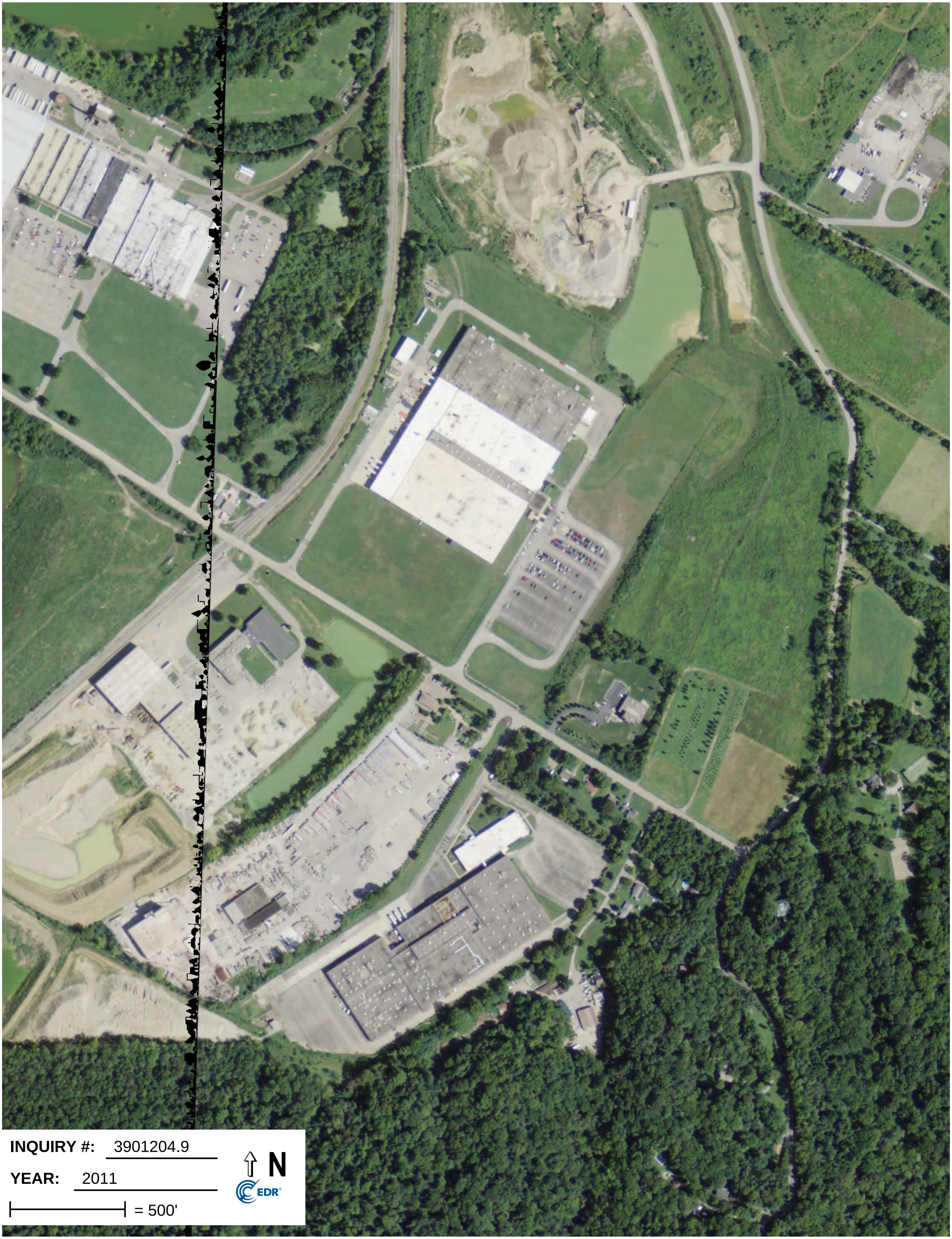
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YEAR: 2011
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EDR

Senco
8450 Broadwell Road
Cincinnati, OH 45244

Inquiry Number: 3901204.3
April 04, 2014

Certified Sanborn® Map Report

EDR®

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

4/04/14

Site Name:	**Client Name:**
Senco	TRC Environmental
8450 Broadwell Road	11231 Cornell Park Drive
Cincinnati, OH 45244	Cincinnati, OH 45242
EDR Inquiry # 3901204.3	Contact: Joe Bruns

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by TRC Environmental Corporation were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

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Certified Sanborn Results:

Site Name:	Senco
Address:	8450 Broadwell Road
City, State, Zip:	Cincinnati, OH 45244
Cross Street:	
P.O. #	Pending
Project:	214114.0000
Certification #	0EE1-4896-8146

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results
Certification # 0EE1-4896-8146

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- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

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Senco
8450 Broadwell Road
Cincinnati, OH 45244

Inquiry Number: 3901204.4
April 04, 2014

EDR Historical Topographic Map Report

EDR®

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Historical Topographic Map

N ↑	TARGET QUAD NAME: EAST CINCINNATI MAP YEAR: 1900 SERIES: 15 SCALE: 1:62500	SITE NAME: Senco ADDRESS: 8450 Broadwell Road Cincinnati, OH 45244 LAT/LONG: 39.1353 / -84.3137	CLIENT: TRC Environmental Corporation CONTACT: Joe Bruns INQUIRY#: 3901204.4 RESEARCH DATE: 04/04/2014

Historical Topographic Map

N

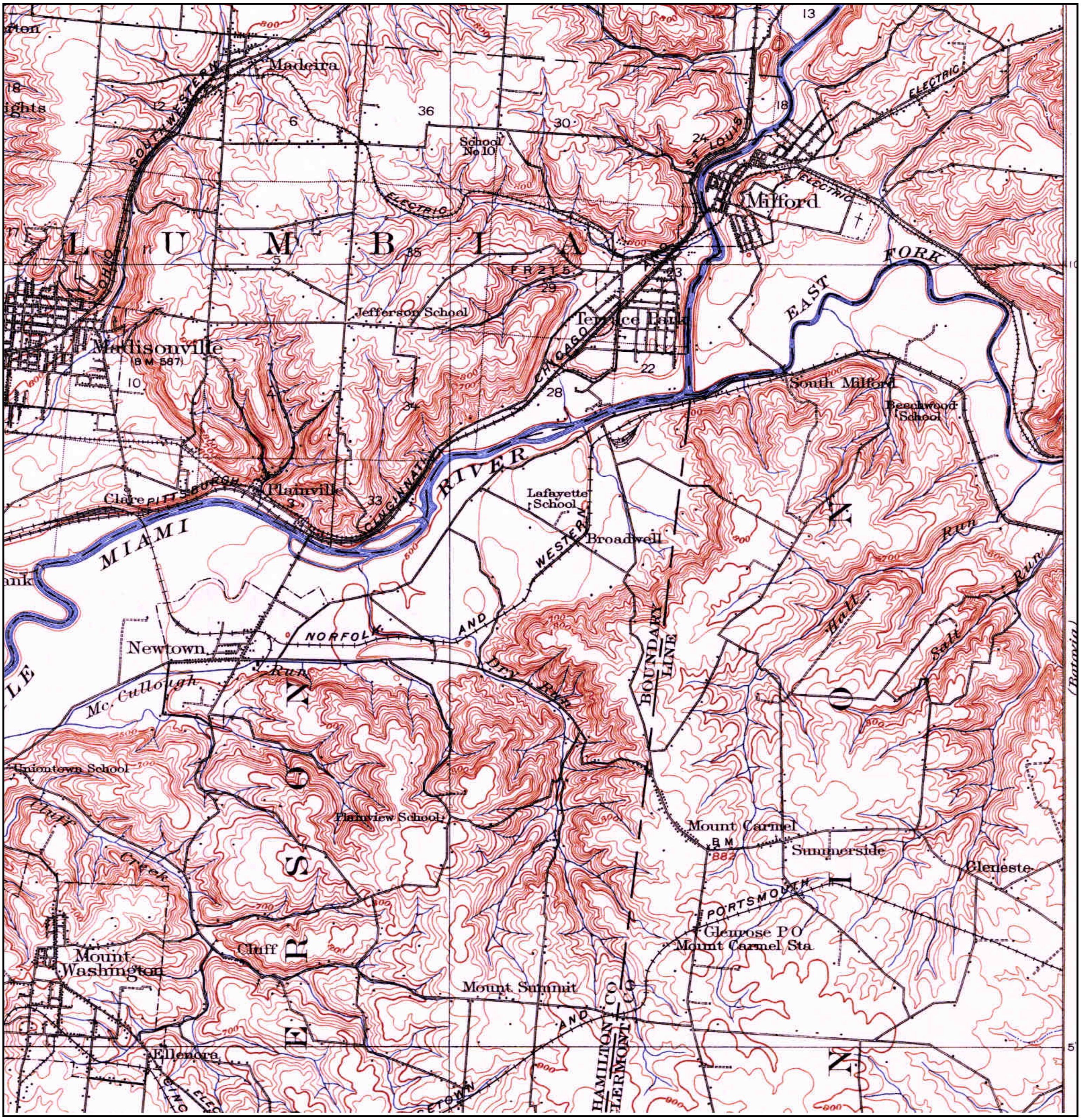
TARGET QUAD
NAME: CINCINNATI
MAP YEAR: 1914

SERIES: 15
SCALE: 1:62500

SITE NAME: Senco
ADDRESS: 8450 Broadwell Road
Cincinnati, OH 45244
LAT/LONG: 39.1353 / -84.3137

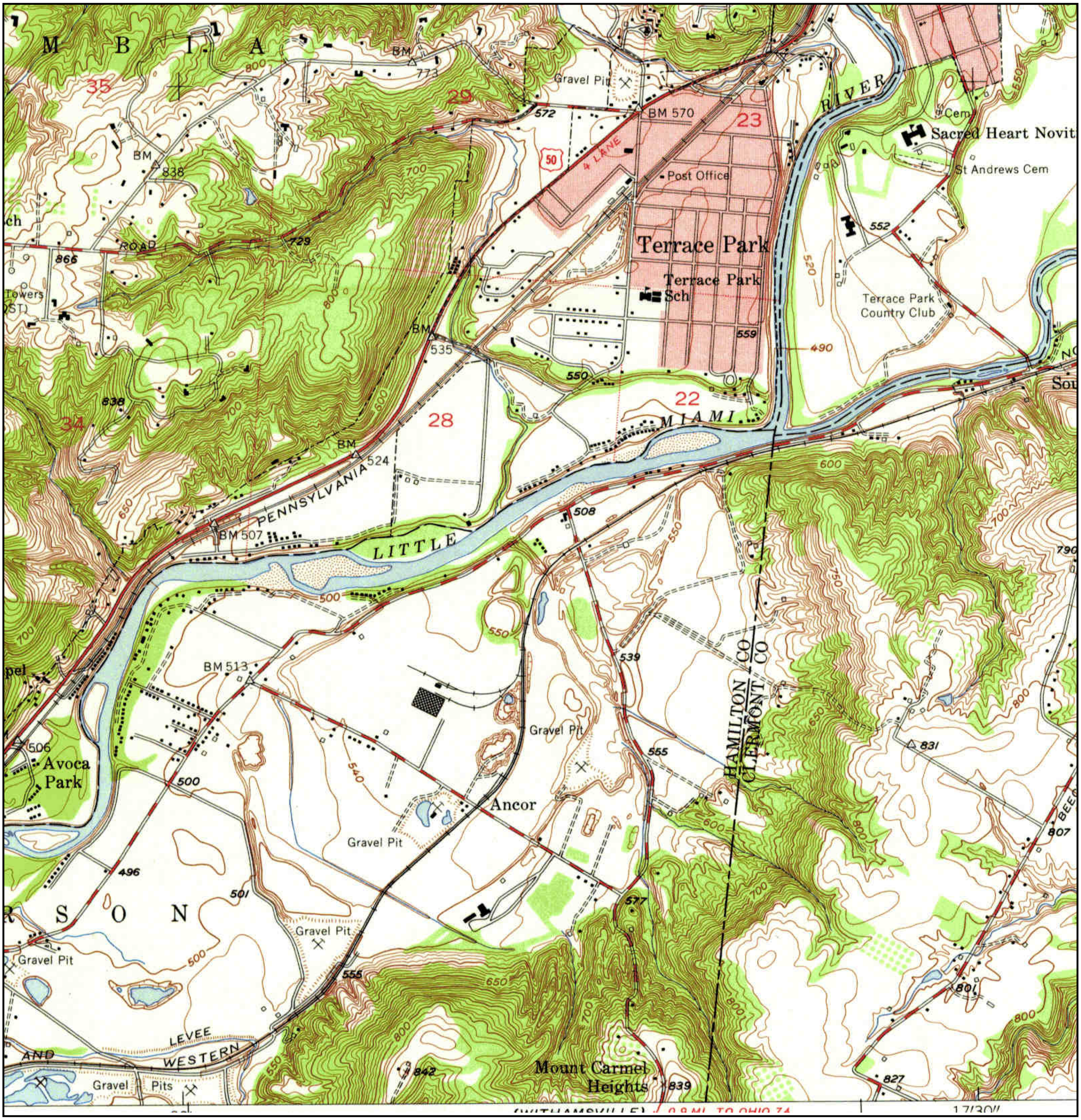
CLIENT: TRC Environmental Corporation
CONTACT: Joe Bruns
INQUIRY#: 3901204.4
RESEARCH DATE: 04/04/2014

Historical Topographic Map



N	TARGET QUAD NAME: EAST CINCINNATI MAP YEAR: 1914 SERIES: 15 SCALE: 1:62500	SITE NAME: Senco ADDRESS: 8450 Broadwell Road Cincinnati, OH 45244 LAT/LONG: 39.1353 / -84.3137	CLIENT: TRC Environmental Corporation CONTACT: Joe Bruns INQUIRY#: 3901204.4 RESEARCH DATE: 04/04/2014

Historical Topographic Map

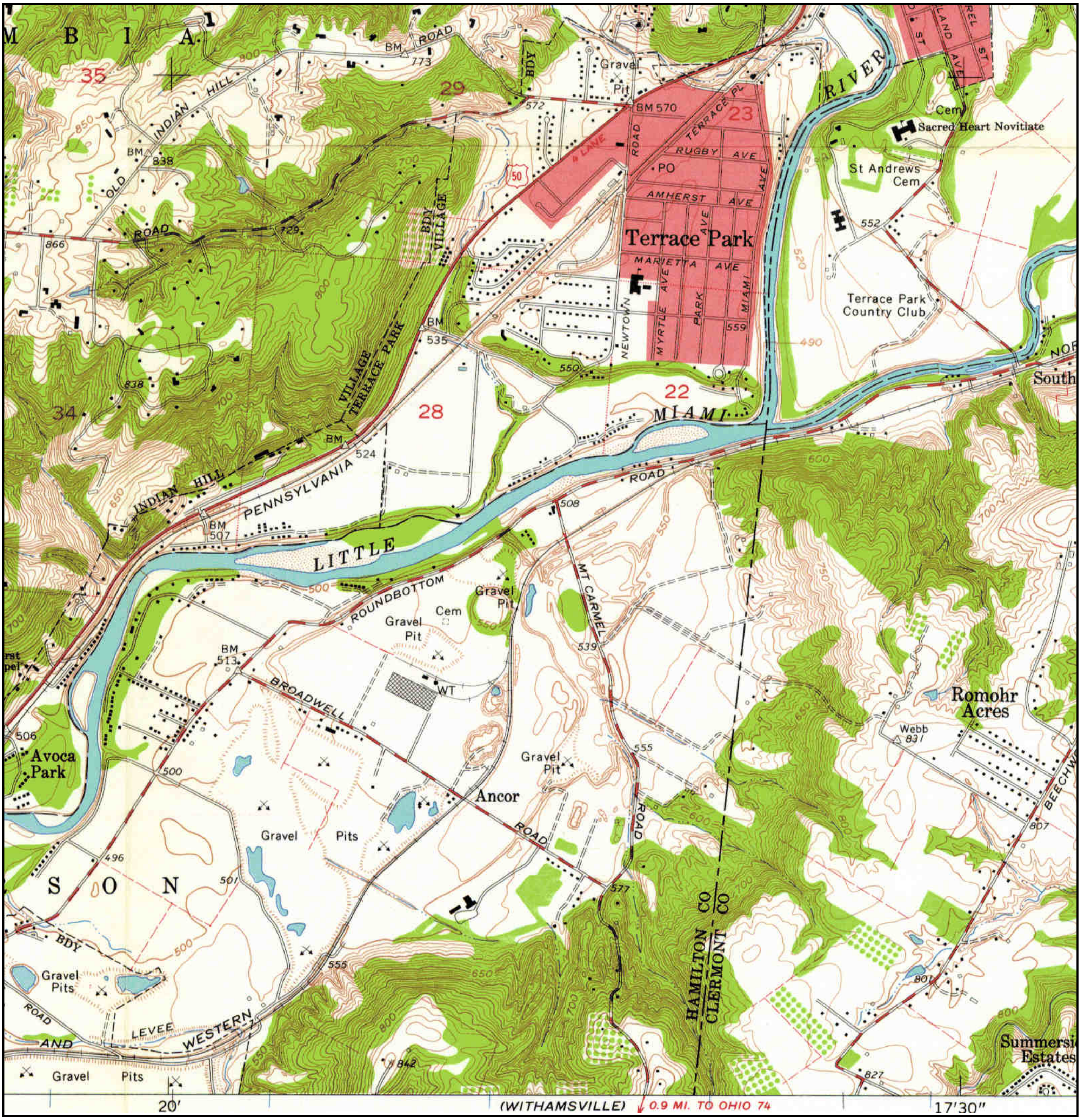


N	TARGET QUAD NAME: MADEIRA MAP YEAR: 1953 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Senco ADDRESS: 8450 Broadwell Road Cincinnati, OH 45244 LAT/LONG: 39.1353 / -84.3137	CLIENT: TRC Environmental Corporation CONTACT: Joe Bruns INQUIRY#: 3901204.4 RESEARCH DATE: 04/04/2014

Historical Topographic Map

N	TARGET QUAD	SITE NAME:	Senco	CLIENT:	TRC Environmental Corporation
	NAME: CINCINNATI VICINITY 1 OF 4	ADDRESS:	8450 Broadwell Road Cincinnati, OH 45244	CONTACT:	Joe Bruns
	MAP YEAR: 1955	LAT/LONG:	39.1353 / -84.3137	INQUIRY#:	3901204.4
	SERIES: 7.5			RESEARCH DATE:	04/04/2014
	SCALE: 1:24000				

Historical Topographic Map



N	TARGET QUAD NAME: MADEIRA MAP YEAR: 1961 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Senco ADDRESS: 8450 Broadwell Road Cincinnati, OH 45244 LAT/LONG: 39.1353 / -84.3137	CLIENT: TRC Environmental Corporation CONTACT: Joe Bruns INQUIRY#: 3901204.4 RESEARCH DATE: 04/04/2014

Historical Topographic Map

N	TARGET QUAD NAME: MADEIRA MAP YEAR: 1970 PHOTOREVISED FROM :1961 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Senco ADDRESS: 8450 Broadwell Road Cincinnati, OH 45244 LAT/LONG: 39.1353 / -84.3137	CLIENT: TRC Environmental Corporation CONTACT: Joe Bruns INQUIRY#: 3901204.4 RESEARCH DATE: 04/04/2014

Historical Topographic Map

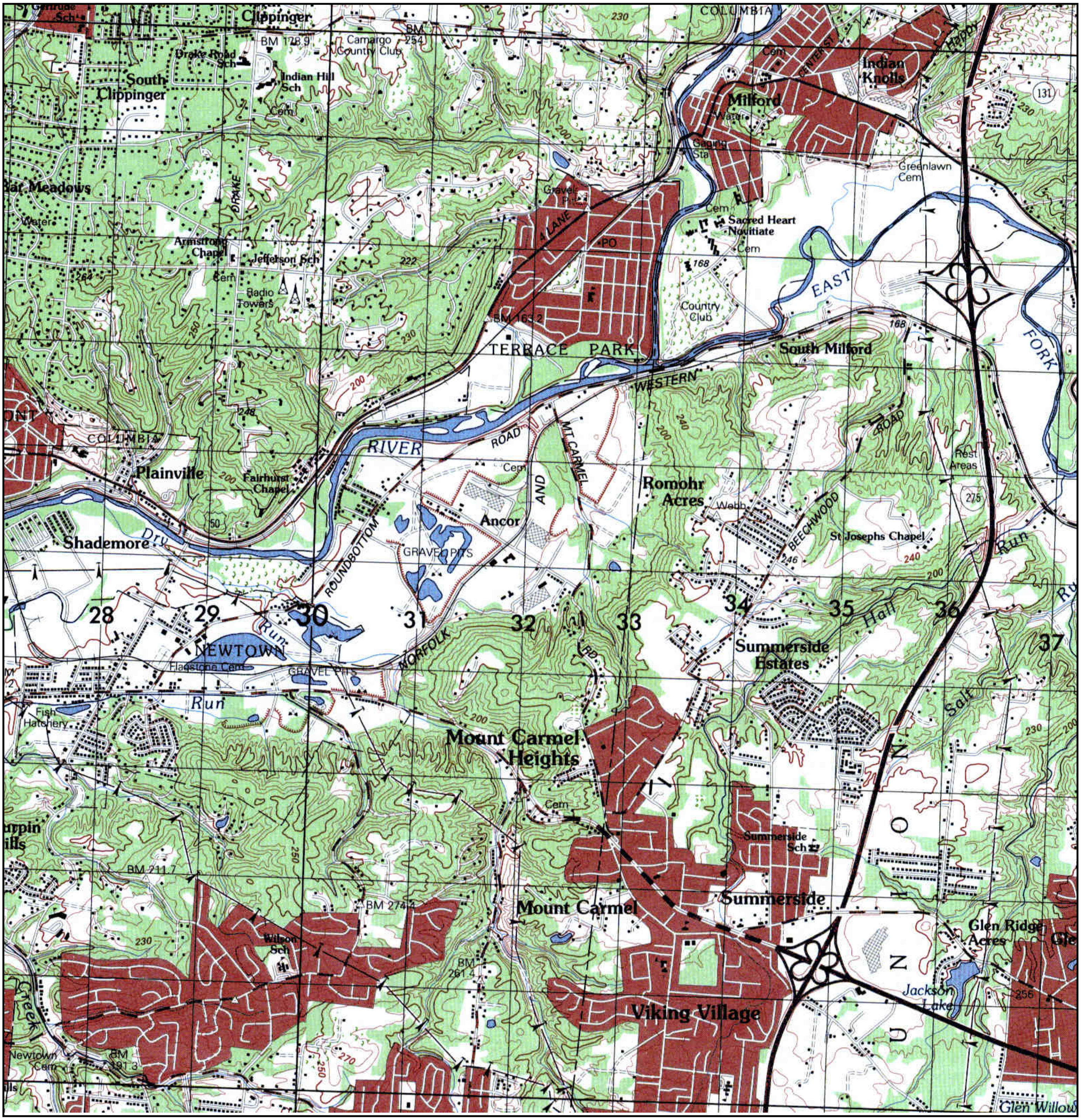
N

TARGET QUAD
NAME: MADEIRA
MAP YEAR: 1974
PHOTOREVISED FROM :1961
SERIES: 7.5
SCALE: 1:24000

SITE NAME: Senco
ADDRESS: 8450 Broadwell Road
Cincinnati, OH 45244
LAT/LONG: 39.1353 / -84.3137

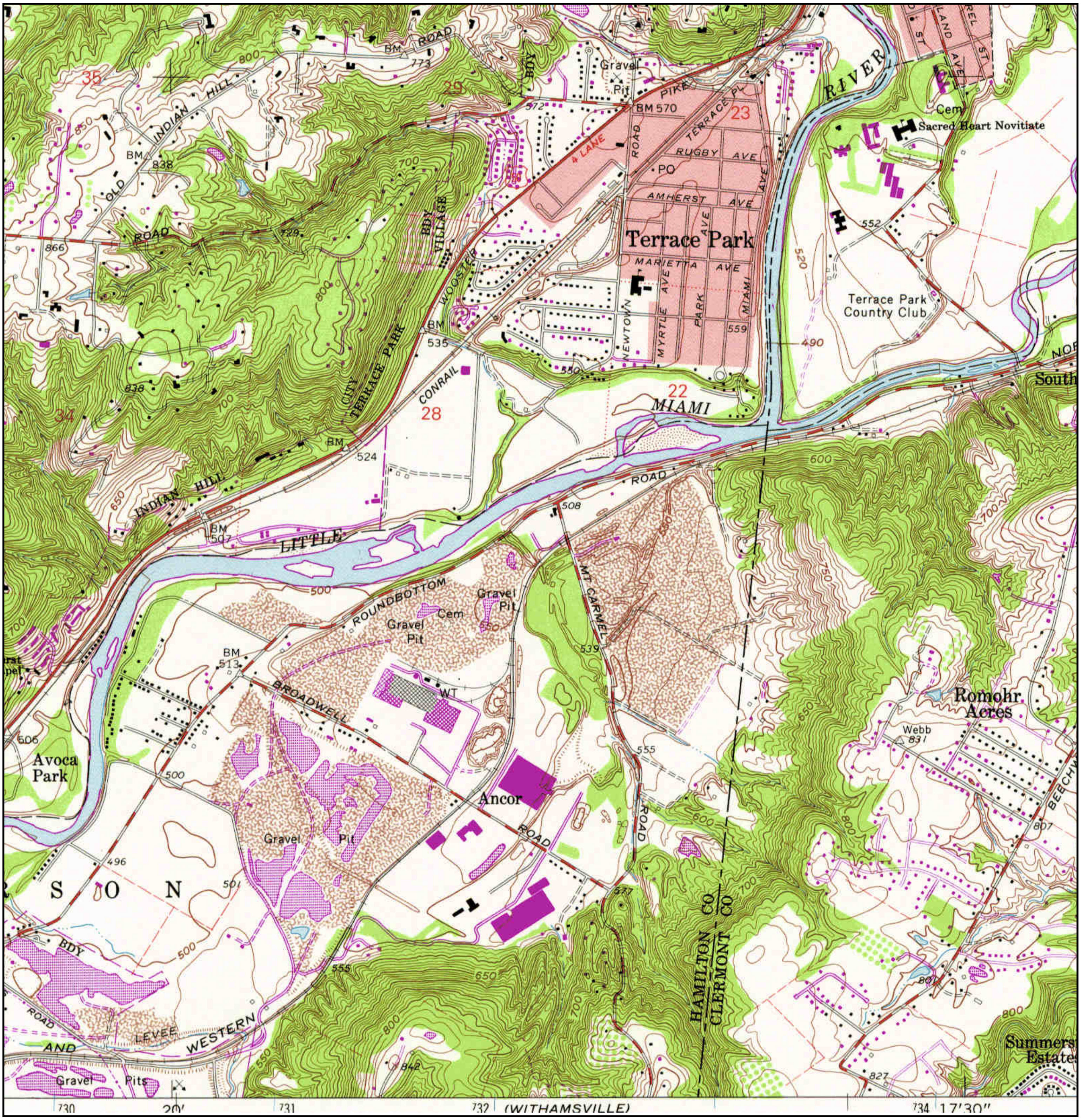
CLIENT: TRC Environmental Corporation
CONTACT: Joe Bruns
INQUIRY#: 3901204.4
RESEARCH DATE: 04/04/2014

Historical Topographic Map



N	TARGET QUAD NAME: EAST CINCINNATI MAP YEAR: 1979 SERIES: 15 SCALE: 1:50000	SITE NAME: Senco ADDRESS: 8450 Broadwell Road Cincinnati, OH 45244 LAT/LONG: 39.1353 / -84.3137	CLIENT: TRC Environmental Corporation CONTACT: Joe Bruns INQUIRY#: 3901204.4 RESEARCH DATE: 04/04/2014

Historical Topographic Map



TARGET QUAD NAME: MADEIRA MAP YEAR: 1982 PHOTOREVISED FROM :1961 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Senco ADDRESS: 8450 Broadwell Road Cincinnati, OH 45244 LAT/LONG: 39.1353 / -84.3137	CLIENT: TRC Environmental Corporation CONTACT: Joe Bruns INQUIRY#: 3901204.4 RESEARCH DATE: 04/04/2014

Historical Topographic Map

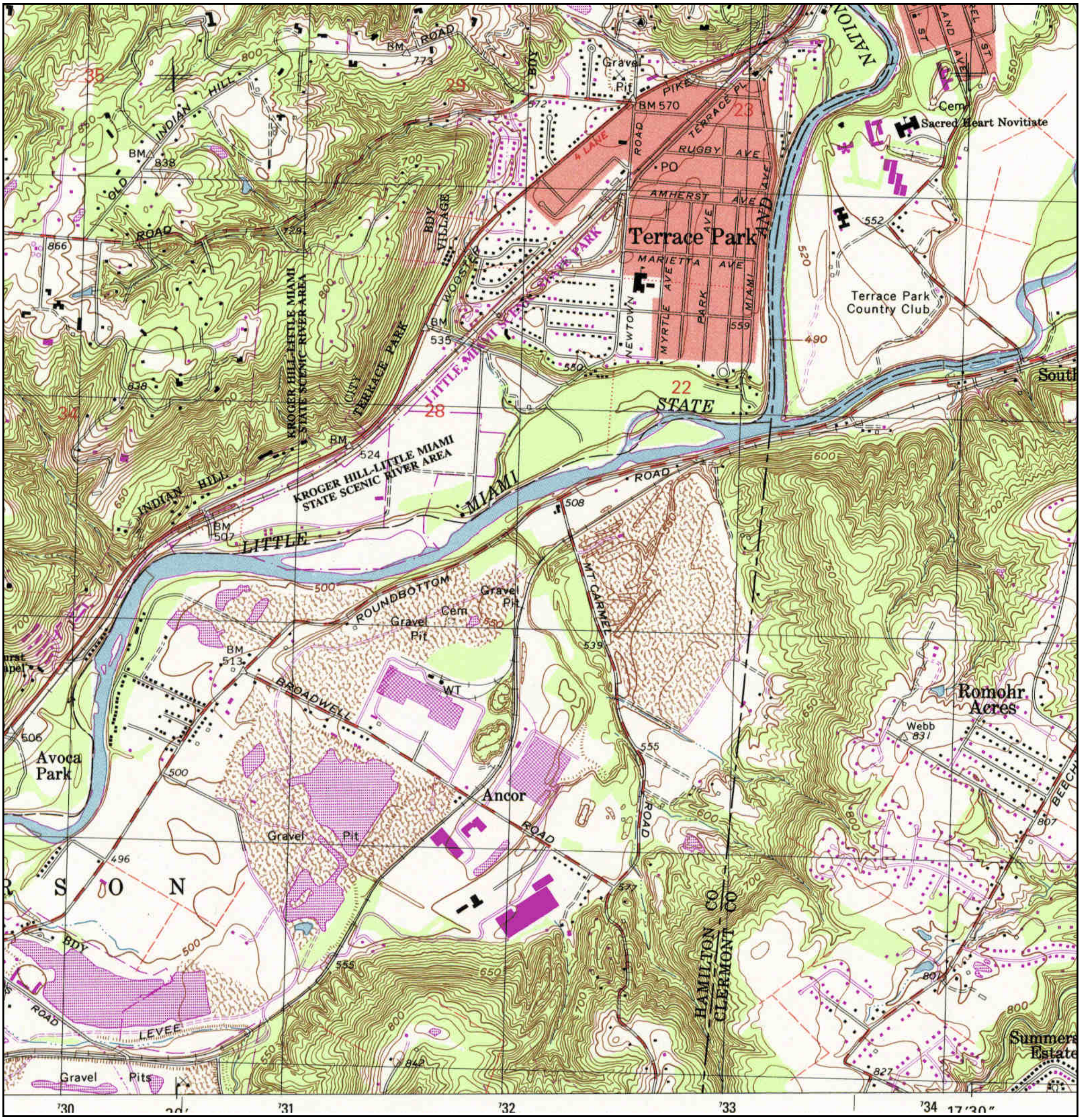
N

TARGET QUAD
NAME: MADEIRA
MAP YEAR: 1988
PHOTOREVISED FROM :1961
SERIES: 7.5
SCALE: 1:24000

SITE NAME: Senco
ADDRESS: 8450 Broadwell Road
Cincinnati, OH 45244
LAT/LONG: 39.1353 / -84.3137

CLIENT: TRC Environmental Corporation
CONTACT: Joe Bruns
INQUIRY#: 3901204.4
RESEARCH DATE: 04/04/2014

Historical Topographic Map



N	TARGET QUAD NAME: MADEIRA MAP YEAR: 1996 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Senco ADDRESS: 8450 Broadwell Road Cincinnati, OH 45244 LAT/LONG: 39.1353 / -84.3137	CLIENT: TRC Environmental Corporation CONTACT: Joe Bruns INQUIRY#: 3901204.4 RESEARCH DATE: 04/04/2014

SENCO
8450 Broadwell Road
Cincinnati, OH 45244

Inquiry Number: 3901204.11s
April 4, 2014

EDR-Industrial Site Package™

Air, Water, OSHA Report

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

The EDR Industrial Site Addendum is a comprehensive presentation of government filings on a facility
The report is divided into three sections:

Section 1: Facility Summary . . . . Page 3

Summary of facility filings including a review of the following areas: air emissions, water discharges, and health & safety issues.
Due to inconsistent name and/or locational information, records on the same facility may be listed in separate facility columns.

Section 2: Facility Detail Reports . . . . Page 4

All available detailed information from databases where sites are identified.

Section 3: Databases Searched and Update Information. . . . . Page 15

Name, source, update dates, contact phone number and description of each of the databases searched for this report.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

SECTION 1: FACILITY SUMMARY

Due to inconsistent name and/or locational information, records on the same facility may be listed in separate facility columns.

	RECORD 1 **SENCO PRODUCTS INC.** 8450 BROADWELL RD. CINCINNATI, OH EDR ID #I-5396119
AIR EMISSIONS Permitted air emissions (AIRS)	**YES - p5**
Reported emergency releases to air (ERNS/A)	NO
Compliance data (AIRS/COM)	**YES - p5**
WATER DISCHARGES Permitted waste water discharges (NPDES/PCS)	NO
Reported emergency releases to water (ERNS/W)	NO
Enforcement actions (NPDES/PCS-ENF)	NO
Inactive waste water discharges (NPDES-PCS INACT)	NO
Stormwater permit (STORMWATER)	NO
HEALTH AND SAFETY Inspected by the Occupational Safety and Health Administration (OSHA)	NO
Violations under OSHA (OSHA/VIOL)	NO
Facility has had accidents according to the Occupational Safety and Health Administration (OSHA/ACC)	NO
TOTAL (YES)	2

- A "NO" indicates that no findings were identified based on an exact name, address and/or EPA facility identification number search. Facility information may be available under an alternate name, address and/or EPA identification number.
- NR = Not Requested

SECTION 2: FACILITY DETAIL REPORTS

Record 1: SENCO PRODUCTS INC.
CINCINNATI, OH (EDR ID# I-5396119)

AIR EMISSIONS

Facility has permitted air emissions . . . . . YES

Facility has reported emergency releases to air. . . . . NO

Facility has compliance data . . . . . YES

WATER DISCHARGES

Facility has permitted waste water discharges. . . . . NO

Facility has reported emergency releases to water. . . . . NO

Facility has enforcement actions . . . . . NO

Facility has an inactive waste water permit. . . . . NO

Facility has stormwater discharges . . . . . NO

HEALTH AND SAFETY

Facility has been inspected by the Occupational Safety and Health Administration . . . . . NO

Facility has violations cited by the Occupational Safety and Health Administration. . . . . NO

Facility has had accidents according to the Occupational Safety and Health Administration. . . . . NO

TOTALS (YES) 2

AIR EMISSIONS

Facility has emitted air emissions

Facility has compliance data

DATABASE: Aerometric Information Retrieval System (AIRS)

SENCO PRODUCTS INC.
8450 BROADWELL RD.
CINCINNATI, OH
EDR ID #I-5396119

AIRS (AFS):

Compliance and Violation Data Major Sources:

EPA plant ID:	110000393887
Plant name:	SENCO PRODUCTS INC.
Plant address:	8450 BROADWELL RD. CINCINNATI, OH 452441611
County:	HAMILTON
Region code:	05
Dunn & Bradst #:	004251070
Air quality cntrl region:	079
Sic code:	3495
Sic code desc:	WIRE SPRINGS
North Am. industrial classf:	332612
NAIC code description:	Spring (Light Gauge) Manufacturing
Default compliance status:	Not reported
Default classification:	ACTUAL OR POTENTIAL EMISSIONS ARE ABOVE THE APPLICABLE MAJOR SOURCE THRESHOLDS
Govt facility:	ALL OTHER FACILITIES NOT OWNED OR OPERATED BY A FEDERAL, STATE, OR LOCAL GOVERNMENT
Current HPV:	Not reported

Compliance and Enforcement Major Issues:

Air program:	SIP SOURCE
National action type:	MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved:	000215
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	ST SOURCE TEST CONDUCTED
Date achieved:	000808
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	030318
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	030318
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	030318
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	030318
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved:	030318
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	NXXXXX
Date achieved:	030430
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	NXXXXX
Date achieved:	030430
Penalty amount:	000000000

Air program:	SIP SOURCE
National action type:	FINAL COMPLIANCE
Date achieved:	030508
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	FINAL COMPLIANCE
Date achieved:	030508
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved:	030509
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	030518
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED PCE/ ON-SITE
Date achieved:	030518
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE DAY 0
Date achieved:	030604
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE DAY 0
Date achieved:	030604
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	EPA CONDUCTED PCE/ ON-SITE
Date achieved:	030624
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	EPA CONDUCTED PCE/ ON-SITE
Date achieved:	030624
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	EPA CONDUCTED FCE / ON-SITE
Date achieved:	030624
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	EPA CONDUCTED FCE / ON-SITE
Date achieved:	030624
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	STATE REPORTED AS ADDED
Date achieved:	030728
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE REPORTED AS ADDED
Date achieved:	030728
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	030729
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	SV RESOLVED
Date achieved:	030729
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	030729
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	SV RESOLVED
Date achieved:	030729
Penalty amount:	000000000

Air program: SIP SOURCE
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 030729
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE SV REPORTED AS ADDRESSED
Date achieved: 030729
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPL BY STATE, NO ACT REQ
Date achieved: 030729
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION EPA REVIEW
Date achieved: 040218
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / OFF-SITE
Date achieved: 040309
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 040309
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED FCE / OFF-SITE
Date achieved: 040309
Penalty amount: 000000000

Air program: MACT (SECTION 63 NESHAPS)
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 040309
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 040309
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V COMPLIANCE CERT DUE/RECEIVED BY
Date achieved: 040505
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 040524
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 040524
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: FINAL COMPLIANCE
Date achieved: 040629
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: FINAL COMPLIANCE
Date achieved: 040629
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: NXXXXX
Date achieved: 040708
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: NXXXXX
Date achieved: 040708
Penalty amount: 000000000

Air program: TITLE V PERMITS
National action type: STATE REPORTED AS ADDED
Date achieved: 040730
Penalty amount: 000000000

Air program:	SIP SOURCE
National action type:	STATE REPORTED AS ADDED
Date achieved:	040730
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE DAY 0
Date achieved:	040822
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE DAY 0
Date achieved:	040822
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	SV RESOLVED
Date achieved:	040829
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	040829
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	040829
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	SV RESOLVED
Date achieved:	040829
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	040829
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	040829
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	040829
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	040829
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	050902
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	050902
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	051214
Penalty amount:	Not reported
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	051214
Penalty amount:	Not reported
Air program:	TITLE V PERMITS
National action type:	STATE CONDUCTED FCE / OFF-SITE
Date achieved:	051214
Penalty amount:	Not reported
Air program:	SIP SOURCE
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	060118
Penalty amount:	000000000

Air program:	TITLE V PERMITS
National action type:	FINAL COMPLIANCE
Date achieved:	060118
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	060118
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	FINAL COMPLIANCE
Date achieved:	060118
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	060118
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	FINAL COMPLIANCE
Date achieved:	060118
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	FINAL COMPLIANCE
Date achieved:	060119
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	060119
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	060119
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	FINAL COMPLIANCE
Date achieved:	060119
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	COMPL BY STATE, NO ACT REQ
Date achieved:	060119
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	FINAL COMPLIANCE
Date achieved:	060119
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	060410
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	060410
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	STATE SV REPORTED AS ADDRESSED
Date achieved:	060410
Penalty amount:	000000000
Air program:	TITLE V PERMITS
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	060517
Penalty amount:	000000000
Air program:	MACT (SECTION 63 NESHAPS)
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	060517
Penalty amount:	000000000
Air program:	SIP SOURCE
National action type:	COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved:	060517
Penalty amount:	000000000

Air program: SIP SOURCE
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 070122
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: OWNER/OPERATOR CONDUCTED SOURCE TEST
Date achieved: 070122
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 070122
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 070122
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 070427
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 070427
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 070430
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 070430
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED FCE / OFF-SITE
Date achieved: 080313
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / OFF-SITE
Date achieved: 080313
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 080430
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 080430
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 080505
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 080505
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 080905
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED PCE/ ON-SITE
Date achieved: 080905
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 090202
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 090202
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 090414
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 090414
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 100301
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 100301
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 100510
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 100510
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 100524
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 100524
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 110426
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 110426
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 110509
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 110509
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 120424
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 120424
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 120509
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 120509
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 120619
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: STATE CONDUCTED FCE / ON-SITE
Date achieved: 120619
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: TITLE V ANN COMPL CERT DUE/RCV BY PERMIT AUTHORITY
Date achieved: 130724
Penalty amount: Not reported

Air program: TITLE V PERMITS
National action type: COMPLIANCE CERTIFICATION STATE REVIEW
Date achieved: 130806
Penalty amount: Not reported

Air program: SIP SOURCE
National action type: MULTI MEDIA INSPECTION - LEVEL 2 OR GREATER
Date achieved: 970212
Penalty amount: 000000000

Air program: SIP SOURCE
National action type: EPA INSPECTION - LEVEL 2 OR GREATER
Date achieved: 981105
Penalty amount: 000000000

Historical Compliance Minor Sources:

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1004
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1101
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1104
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1204
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1303
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: Not reported
Hist compliance date: 1103
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1201
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1202
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1204
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1302
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1303
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1004
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1004
Air prog code hist file: TITLE V PERMITS

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1101
Air prog code hist file: SIP SOURCE

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1101
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1102
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1103
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1201
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1202
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1203
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1301
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: IN COMPLIANCE - INSPECTION
Hist compliance date: 1302
Air prog code hist file: MACT (SECTION 63 NESHAPS)

State compliance status: Not reported
Hist compliance date: 1102
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1102
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1103
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1104
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1104
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1201
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1202
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1203
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1203
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1204
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1301
Air prog code hist file: SIP SOURCE

State compliance status: Not reported
Hist compliance date: 1301
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported

Hist compliance date: 1302
Air prog code hist file: TITLE V PERMITS

State compliance status: Not reported
Hist compliance date: 1303
Air prog code hist file: SIP SOURCE

SECTION 3: DATABASES SEARCHED AND UPDATE DATES

To maintain currency of the following federal, state and local databases, EDR contacts the appropriate government agency on a monthly or quarterly basis as required.

Elapsed ASTM days: Provides confirmation that this report meets or exceeds the 90-day updating requirement of the ASTM standard.

FACILITY RELATED DATABASES

AIR EMISSIONS

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
Source: EPA
Telephone: 202-564-5962
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/23/2013
Database Release Frequency: Annually
Date of Last EDR Contact: 03/31/2014
Date of Next Scheduled Update: 07/14/2014

ERNS: Emergency Response Notification System
Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/30/2013
Database Release Frequency: Annually
Date of Last EDR Contact: 04/04/2014
Date of Next Scheduled Update: 07/14/2014

WATER DISCHARGES

PCS: Permit Compliance System
Source: EPA, Office of Water
Telephone: 202-564-2496
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/17/2014
Date of Next Scheduled Update: 06/30/2014

PCS: Permit Compliance System
Source: EPA, Office of Water
Telephone: 202-564-2496
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 03/17/2014
Date of Next Scheduled Update: 06/30/2014

PCS INACTIVE: Listing of Inactive PCS Permits
Source: EPA
Telephone: 202-564-2496
An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 07/29/2011
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 01/10/2014
Date of Next Scheduled Update: 04/28/2014

ERNS: Emergency Response Notification System
Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/30/2013
Database Release Frequency: Annually
Date of Last EDR Contact: 04/04/2014
Date of Next Scheduled Update: 07/14/2014

HEALTH AND SAFETY

OSHA: Occupational Safety and Health Administration
Source: DOL, OSHA, Office of Mgmt Data
Telephone: 202-693-1700
Specific inspection, violation and fatality/catastrophe information regarding inspections of interest.

Date of Government Version: 12/31/2010
Database Release Frequency: Annually
Date of Last EDR Contact: 03/24/2014
Date of Next Scheduled Update: 07/07/2014

Appendix III

November 17, 2008 Public Records Request for Senco Products

OhioEPA

State of Ohio Environmental Protection Agency

Southwest District Office

401 E. Fifth St.
Dayton, Ohio 45402

TELE: (937) 285-6357 FAX: (937) 285-6249
www.epa.state.oh.us

Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director

November 28, 2008

Ms. Jessica Penetar
Environ International
213 Carnegie Center
Princeton, New Jersey 08540

Dear Ms. Penetar:

Enclosed are copies of EPA's Southwest District Office files which respond to your November 17, 2008 public records request for Senco Products. These files were given to me after the file review.

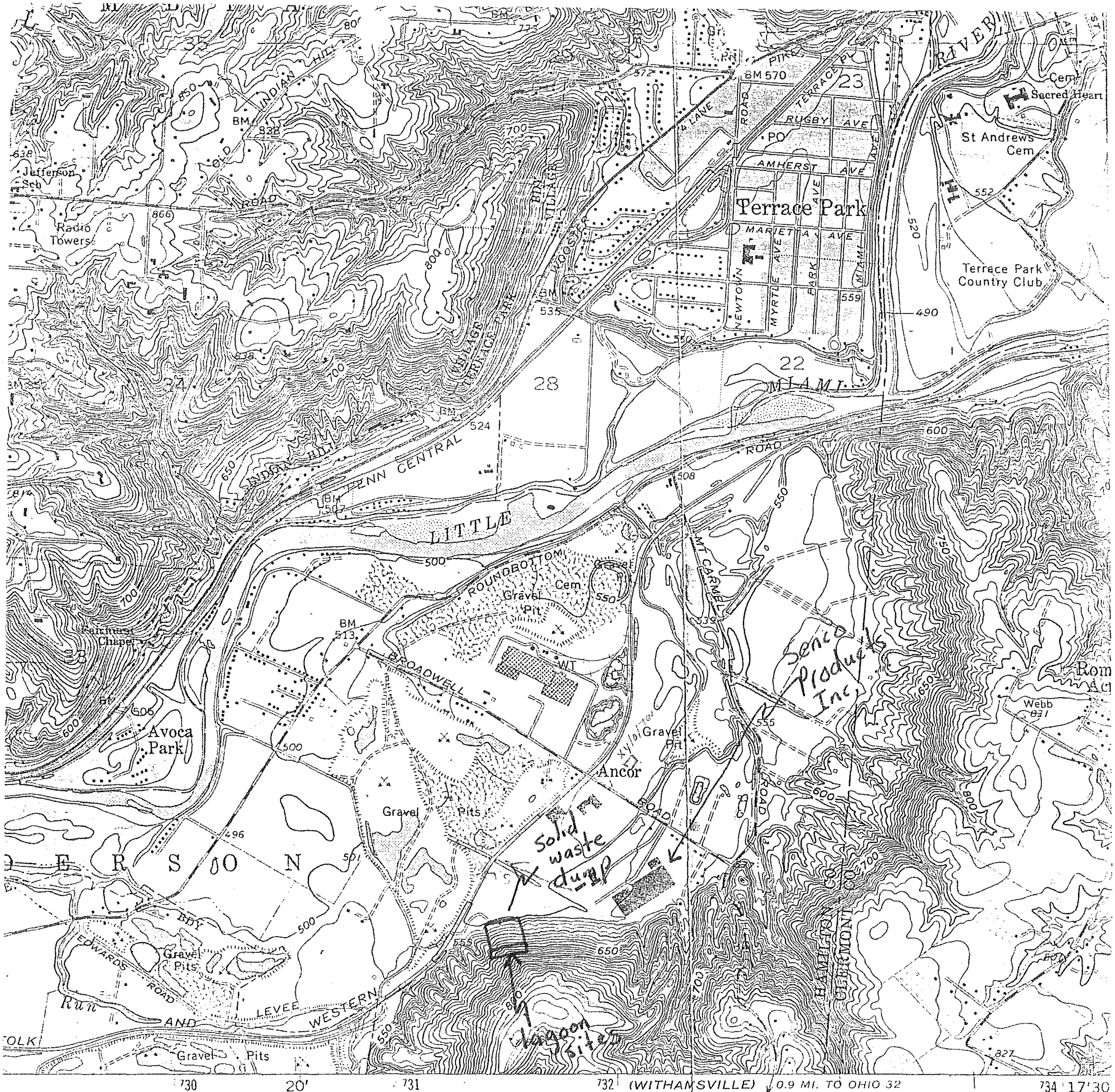
If you have any questions, please contact me at (937) 285-6025. Thank you.

Sincerely,

Sally Brown

Sally Brown
Public Information Specialist

Enclosures



MADIERA QUAD. 179NE

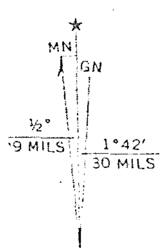
SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL



UTM GRID AND 1970 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, WASHINGTON, D.C. 20242
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

KZF

ENVIRONMENTAL DESIGN CONSULTANTS INC
ARCHITECTS • ENGINEERS • PLANNERS • SURVEYORS
2830 Victory Parkway, Cincinnati, Ohio. 45206 (513)281-7723

May 1, 1978

O.E.P.A.
7 East Fourth Street
Dayton, Ohio 45402

RECEIVED
MAY 3 1978
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

Attn: Mr. James Pennino

Re: Senco Nail Cleaning Waste
Newtown, Ohio
KZF Comm. No. 1018 VB

Dear Sir:

Enclosed is one copy of the data and analysis sheets (Sheet No. 1-13) regarding Senco's Nail Cleaning operations. Please note the asterisk shown under the detergent row indicates a very high level of detergents.

We have been commissioned by Senco to develop various alternatives of disposal for their nail cleaning waste other than their present lagoon system. One such method is to treat the waste for on site discharge. Please advise what levels of concentration and parameter would be required for on site discharge.

Thank you.

Very truly yours,

KZF, INCORPORATED

Michael M. Powell

Michael M. Powell, P.E.

MMP/as

Enclosure

cc T. Haskell - Senco
R. Staub - Senco
G. Bates - KZF
N. Tsimaras - KZF

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SHEET NO. 1 OF 13
JOB NO.
PROJECT Senco Nail Cleaning
SUBJECT Test Analysis of Nail Cleaning Waste
BY ... DATE ...
CHKD. BY ... DATE ...

RANSOHOFF SAMPLING BEFORE PURGE

IDENTIFICATION	RAN #1	RAN #1	RAN #2	RAN #2	RAN #2
DATE	10/7/77	10/21/77	10/1/77	10/15/77	11/3/77
TIME	12:15 AM	1:15 AM	12:00 Mid	12:30 AM	12:05 AM
TEMP. DEGREES F	164°	152°	136°	180°	140°
VOLUME, GALS.	650	650	625	375	400
PH	5.9	5.5	6.3	5.7	5.5
BOD (5)	1109	2485	6265	5602	3304
TOT. SUSP. SLDS.	1190	3796	6530	12,428	3460
CADMIUM	0.1	0.1	0.1	0.2	0.1
ZINC	25.5	5.4	8.7	224.5	115
TOTAL CHROMIUM	1.7	0.1	0.3	0.2	0.75
HEXAVALENT CHROM.	< 0.2	< 0.2	< 0.2	< 0.2	0.2
OIL & GREASE	25,740	6204	6957	28,464	2614
COD	11,420	21,504	24,192	34,496	14,336
TKN	5,200	8,250	2,900	10,250	6,250
CYANIDE	< 0.1	< 0.1	< 0.1	< 0.1	< 1.0
CALCIUM	7.5	68		100.8	22.1
MAGNESIUM	7.4	10.2		11.9	11.6
ALUMINUM	2.7	2.4		2.4	2.0

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BY........ DATE........ PROJECT Senco Nail Cleaning

CHKD. BY........ DATE........ SUBJECT Test Analysis of Nail Cleaning Waste

JOB NO.........

RANSOHOFF SAMPLING BEFORE PURGE

IDENTIFICATION	RAN #1	RAN #1	RAN #2	RAN #2	RAN #2
IRON	210.9	220		272.0	271
LEAD	0.95	0.8		0.9	0.6
TOTAL DISSOL. SOL.	121,926	130,666		120,360	96,932
NITRITE NITROGEN	<1.0	<1.0		<1.0	2.0
PHOSPHATES	3490	3620		4230	5460
SULPHATES	1432	1241		1543	1826
CHLORIDES	400	205		235	325
FLUORIDES	1.2	0.9		1.0	1.1
MBAS	<1.0	<1.0		<1.0	<1.0
DETERGENTS	*	*		*	

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SHEET NO. 3 OF 13
JOB NO.
PROJECT Senco Nail Cleaning
SUBJECT Test Analysis of Nail Cleaning Waste
BY .... DATE ....
CHKD. BY .... DATE ....

RANSOHOFF SAMPLING AFTER PURGE

IDENTIFICATION	RAN #1	RAN #2			
DATE	10/22/77	11/4/77			
TIME	12:23 AM	11:30 PM			
TEMP. DEGREES F	143°	165°			
VOLUME, GALS.	700	400			
PH	13.2	13.0			
BOD (5)	3739	11,979			
TOT. SUSP. SLDS.	2200	7750			
CADMIUM	0.2	0.15			
ZINC	163.2	615			
TOTAL CHROMIUM	0.6	1.8			
HEXAVALENT CHROM.	< 0.2	0.0			
OIL & GREASE	611	2638			
COD	32,256	38,304			
TKN	23.3	43.8			
CYANIDE	< 0.1*	< 1.0			
CALCIUM	297.6	465			
MAGNESIUM	57.6	19.2			
ALUMINUM	14.4	7.5			

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BY .... DATE ....
CHKD. BY .... DATE ....

PROJECT Senco Nail Cleaning
SUBJECT Test Analysis of Nail Cleaning Waste

SHEET NO. 4 OF 13
JOB NO. ....

RANSOHOFF SAMPLING AFTER PURGE

IDENTIFICATION	RAN #1	RAN #2
IRON	3360	1050
LEAD	1.1	3.1
TOTAL DISSOL. SOL.	86,786	85,218
NITRITE NITROGEN	< 1.0	< 1.0
PHOSPHATES	5200	2570
SULPHATES	6674	6981
CHLORIDES	3330	1630
FLUORIDES	< 1.4	1.5
MBAS	< 1.0	< 1.0
DETERGENTS	*	*

SHEET NO. 5 OF 13
JOB NO.

ENVIRONMENTAL DESIGN CO. SULTANTS INC
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PROJECT Senco Nail Cleaning
SUBJECT Test Analysis of Nail Cleaning Waste

BY .... DATE ....
CHKD. BY .... DATE ....

RANSOHOFF SAMPLING AFTER RINSE

IDENTIFICATION	RAN #2				
DATE	11/4/77				
TIME	5:30 AM				
TEMP. DEGREES F	140°				
VOLUME, GALS.	400				
PH	10.4				
BOD (5)	324				
TOT. SUSP. SLDS.	500				
CADMIUM	0.0				
ZINC	4.8				
TOTAL CHROMIUM	0.1				
HEXAVALENT CHROM.	0.0				
OIL & GREASE	560				
COD	428				
TKN	6.1				
CYANIDE	< 1.0				
CALCIUM	18.75				
MAGNESIUM	7.35				
ALUMINUM	1.0				

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BY........ DATE........
CHKD. BY........ DATE........

PROJECT Senco Nail Cleaning
SUBJECT Test Analysis of Nail Cleaning Waste

JOB NO.

	RANSOHOFF SAMPLING AFTER RINSE				
IDENTIFICATION	RAN #2				
IRON	26				
LEAD	0.0				
TOTAL DISSOL. SOL.	792				
NITRITE NITROGEN	<1.0				
PHOSPHATES	130				
SULPHATES	167.9				
CHLORIDES	50				
FLUORIDES	0.8				
MBAS	<1.0				
DETERGENTS	*				

SHEET NO. 7 OF 13
JOB NO.

ENVIRONMENTAL DESIGN CONSULTANTS INC
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PROJECT Senco Nail Cleaning
SUBJECT Test Analysis of Nail Cleaning Waste
BY DATE
CHKD. BY DATE

	#3 NAIL CLEANER OVERFLOW				
IDENTIFICATION	#3 NC	#3 NC	#3 NC		
DATE	8/3/77	8/25/77	8/30/77		
TIME	11:15 PM	3:00 AM	7:00 AM		
TEMP. DEGREES F	60°	84°	105°		
VOLUME, GALS.	100	100	100		
PH	5.85	5.98	6.53		
BOD (5)	2666	2363	2679		
TOT. SUSP. SLDS.	4784	2824	2836		
CADMIUM	0.0	0.0	0.0		
ZINC	4.8	18.7	28.5		
TOTAL CHROMIUM	0.3	0.5	1.1		
HEXAVALENT CHROM.	0.0	0.0	0.0		
OIL & GREASE	7947	9490	6156		
COD	14,112	19,040	19,040		
TKN	816	1200	360		
CYANIDE	< 0.1	< 0.1	< 0.1		
CALCIUM					
MAGNESIUM					
ALUMINUM					

SHEET NO. 8 OF 13
JOB NO.

PROJECT Senco Nail Cleaning
SUBJECT Test Analysis of Nail Cleaning Waste

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2830 Victory Parkway, Cincinnati, Ohio, 45206 (513)281-7723

BY .... DATE ....
CHKD. BY .... DATE ....

	#3 NAIL CLEANER BEFORE PURGE				
IDENTIFICATION	#3 NC	#3 NC			
DATE	10/21/77	11/8/77			
TIME	7:16 AM	12:30 PM			
TEMP. DEGREES F	143°	74°			
VOLUME, GALS.	350	1000			
PH	6.2	5.7			
BOD (5)	3293	3076			
TOT. SUSP. SLDS.	752	92			
CADMIUM		0.0			
ZINC		0.35			
TOTAL CHROMIUM		0.0			
HEXAVALENT CHROM.		0.0			
OIL & GREASE		645			
COD		2554			
TKN		8.9			
CYANIDE		<1.0			
CALCIUM		1165			
MAGNESIUM		7.0			
ALUMINUM		0.5			

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BY .... DATE .... PROJECT Senco Nail Cleaning

CHKD. BY .... DATE .... SUBJECT Test Analysis of Nail Cleaning Waste

SHEET NO. 9 OF 13

JOB NO. ....

	#3 NAIL CLEANER BEFORE PURGE				
IDENTIFICATION	#3 NC	#3 NC			
IRON		2.0			
LEAD		0.0			
TOTAL DISSOL. SOL.		488			
NITRITE NITROGEN		<1.0			
PHOSPHATES		37			
SULPHATES		181.7			
CHLORIDES		10			
FLUORIDES		0.6			
MBAS		<1.0			
DETERGENTS		*			

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BY........ DATE........ PROJECT Senco Nail Cleaning
CHKD. BY........ DATE........ SUBJECT Test Analysis of Nail Cleaning Waste

SHEET NO. 10 OF 13
JOB NO.

#3 NAIL CLEANER AFTER PURGE

IDENTIFICATION	#3 NC				
DATE	11/8/77				
TIME	12:48 PM				
TEMP. DEGREES F	121°				
VOLUME, GALS.	1000				
PH	12.9				
BOD (5)	1894				
TOT. SUSP. SLDS.	2071				
CADMIUM	0.2				
ZINC	16.2				
TOTAL CHROMIUM	2.8				
HEXAVALENT CHROM.	1.9				
OIL & GREASE	1984				
COD	26,432				
TKN	160				
CYANIDE	< 1.0				
CALCIUM	--				
MAGNESIUM	26.25				
ALUMINUM	27.5				

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2830 Victory Parkway, Cincinnati, Ohio. 45206 (513)281-7723

BY .... DATE ....

CHKD. BY .... DATE ....

PROJECT Senco Nail Cleaning

SUBJECT Test Analysis of Nail Cleaning Waste

JOB NO. ....

#3 NAIL CLEANER AFTER PURGE

IDENTIFICATION	#3 NC				
IRON	1200				
LEAD	1.45				
TOTAL DISSOL. SOL.	40,553				
NITRITE NITROGEN	<1.0				
PHOSPHATES	2520				
SULPHATES	7248				
CHLORIDES	380				
FLUORIDES	1.3				
MBAS	23				
DETERGENTS	*				

SHEET NO. 12 OF 13

JOB NO.

ENVIRONMENTAL DESIGN CO. ...ULTANTS INC
ARCHITECTS · ENGINEERS · PLANNERS · SURVEYORS
2630 Victory Parkway, Cincinnati, Ohio. 45206 (513)281-7723

PROJECT Senco Nail Cleaning

SUBJECT Test Analysis of Nail Cleaning Waste

BY .... DATE ....

CHKD. BY .... DATE ....

TANK TRUCK BEFORE PURGE

IDENTIFICATION	TANK TRUCK	TANK TRUCK	TANK TRUCK	TANK TRUCK	
DATE	8/23/77	8/25/77	8/30/77	11/3/77	
TIME	11:15 PM	3:00 AM	7:00 AM	4:30 AM	
TEMP. DEGREES F	86°	71°	85°	80°	
VOLUME, GALS.	2000	1200	1600	2000	
PH	5.90	5.70	5.98	5.60	
BOD (5)	2394	2515	1938	2125	
TOT. SUSP. SLDS.	1056	540	640	732	
CADMIUM	0.0	0.0	0.0		
ZINC	5.0	2.5	0.7		
TOTAL CHROMIUM	0.3	0.4	0.2		
HEXAVALENT CHROM.	0.0	0.0	0.0		
OIL & GREASE	742	1110	1135		
COD	2240	4301	2240		
TKN	744	732	876		
CYANIDE	<0.1	<0.1	<0.1		
CALCIUM					
MAGNESIUM					
ALUMINUM					

JOB NO.

ENVIRONMENTAL DESIGN CONSULTANTS INC
ARCHITECTS · ENGINEERS · PLANNERS · SURVEYORS
2830 Victory Parkway, Cincinnati, Ohio, 45206 (513)281-7723

PROJECT Senco Nail Cleaning
SUBJECT Test Analysis of Nail Cleaning Waste

BY ____ DATE ____
CHKD. BY ____ DATE ____

	TANK TRUCK AFTER PURGE				
IDENTIFICATION	RAN #2 TANK TRUCK	#3 NC TANK TRUCK			
DATE	11/4/77	11/8/77			
TIME	12:40 PM	12:53 PM			
TEMP. DEGREES F	98°	124°			
VOLUME, GALS.	1000	3000			
PH	12.5	12.9			
BOD (5)	8415	1206			
TOT. SUSP. SLDS.	5610	1460			
CADMIUM					
ZINC					
TOTAL CHROMIUM					
HEXAVALENT CHROM.					
OIL & GREASE					
COD					
TKN					
CYANIDE					
CALCIUM					
MAGNESIUM					
ALUMINUM					

senco fastening systems

January 3, 1978

Mr. James D. Pennino
State of Ohio
Environmental Protection Agency
Southwest District Office
7 East Fourth Street
Dayton, Ohio 45402

RECEIVED
JAN 9 1978
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

Dear Mr. Pennino:

Attached to my letter are the final analytical results of our liquid waste which was performed by W. E. Gates and Associates. As we now have the analytical section of this project done, we have turned to KZF to begin work on alternative solutions to the problem.

When we have received the preliminary report from KZF, I will call a meeting so that we can discuss their recommendations. If you have any questions, please don't hesitate to contact me.

Sincerely,

P. A. Eberle

Peter A. Eberle
Corporate Risk Manager

PAE:jkw
cc: N. Day
R. Staub
T. Haskell
M. Powell - KZF
E. Rehme - OEPA

Attachment

senco products inc. · 8485 broadwell rd · cincinnati · ohio 45244 · (513) 474-3000

w.e. gates and associates, inc.
1515 cincinnati-batavia pike / batavia ohio 45103 / 513-732-1212

14 December 1977

Mr. Thomas Haskell
SENCO Products
8485 Broadwell Road
Cincinnati Ohio 45244

Dear Mr. Haskell:

Enclosed are the results of the sampling program conducted on the #3 nail cleaner, the tank truck and the #1 and #2 Rausahoff wastes. If you have any questions, please contact me at any time. I have also enclosed an invoice for these analyses.

Sincerely yours,

Paul D. Koch

Paul D. Koch
Executive Vice President
W.E. Gates & Assoc.

SENCO Industrial Waste Analyses

1Sample I.D.	#2 RANSAHOFF	#1 RANSAHOFF	#2 RANSAHOFF	#1 RANSAHOFF
Date	10-1-77	10-7-77	10-15-77	10-21-77
Time	12:00	12:15	12:30	1:15
Temp. Degress F	136°	164°	180°	152°
Volume, gal	625	650	315	650
PH	6.3	5.9	5.7	5.5
BOD_5, mg/1	6265	1109	5602	2485
Tot. Susp. Slds, mg/1	6530	1190	12,428	3796
Cadmium, mg/1	0.1	0.1	0.2	0.1
Zinc, mg/1	8.7	25.5	224.5	5.4
Total Chromium, mg/1	0.3	1.7	0.2	0.1
Hexavalent Chromium, mg/1	<0.2	<0.2	<0.2	<0.2
Oil & Grease, mg/1	6957	25,740	28,464	6,204
COD, mg/1	24,192	11,420	34,496	21,504
TKN, mg/1	2900	5,200	10,250	8,250
Cyanide, mg/1	<0.1	<0.1	<0.1	<0.1
Calcium, mg/1		7.5	100.8	68
Magnesium, mg/1		7.4	11.9	10.2
Aluminium, mg/1		2.7	2.4	2.4
Iron, mg/1		210.9	272.0	220
Lead, mg/1		0.95	0.9	0.8
Total Dissol. Sol. mg/1		121,926	120,360	130,666
Nitrate Nitrogen, mg/1		<1.0	<1.0	<1.0
Phosphates (DO_4), mg/1		3490	4,230	3620
Sulphates, mg/1		1432	1543	1241
Chlorides, mg/1		400	235	205
Fluorides, mg/1		1.2	1.0	0.9
MBAS, mg/1		<1.0	<1.0	<1.0
Detergents, mg/1		*	*	*

SENCO Industrial Waste Analyses

Sample I.D.	#3 N.C. Aft. Purge	#1 Ransahoff	#2 Ransahoff Before Purge.	Tank Truck
Date	10-21-77	10-22-77	11-3-77	11-3-77
Time	7:16 AM.	12-23 AM	12:05	4:30
Temp. Degress F	143°	143°	140°	80°
Volume, gal	350	700	400	2000
PH	6.2	13.2	5.5	5.6
BOD_5, mg/l	3293	3739	3304	2125
Tot. Susp. Slds, mg/l	752	2200	3460	732
Cadmium, mg/l		0.2	0.1	
Zinc, mg/l		163.2	115	
Total Chromium, mg/l		0.6	0.75	
Hexavalent Chromium, mg/l		<0.2	0.2	
Oil & Grease, mg/l		611	264	
COD, mg/l		32256	14336	
TKN, mg/l		23.3	6250	
Cyanide, mg/l		<1.0	<1.0	
Calcium, mg/l		297.6	22.1	
Magnesium, mg/l		57.6	11.6	
Aluminium, mg/l		14.4	2	
Iron, mg/l		3360	271	
Lead, mg/l		1.1	06	
Total Dissol. Sol. mg/l		86786	96932	
Nitrate Nitrogen, mg/l		<1.0	2.0	
Phosphates (DO_4), mg/l		5200	5460	
Sulphates, mg/l		6674	1826	
Chlorides, mg/l		3330	325	
Fluorides, mg/l		1.4	1.1	
MBAS, mg/l		<1.0	<1.0	
Detergents, mg/l		*	*	

SENCO Industrial Waste Analyses

Sample I.D.	#2 Raw. After Purge.	#2 Raw Aft. Purge.	Tank Truck.	#3 N.C. Bef. Purge.
Date	11-4-77	11-4-77	11-4-77	11-8-77
Time	11:30	5:30	12:40	12:30
Temp. Degress F	165°	140°	98°	63°-74°
Volume, gal	400	400	1000	1000
PH	13.0	10.4	12.5	5.7
BOD_5, mg/l	11979	324	8415	3076
Tot. Susp. Slds, mg/l	7750	500	5610	92
Cadmium, mg/l	0.15	0.0		0.0
Zinc, mg/l	615	4.8		0.35
Total Chromium, mg/l	1.8	0.1		0.0
Hexavalent Chromium, mg/l	0.0	0.0		0.0
Oil & Grease, mg/l	2638	560		645
COD, mg/l	38304	428		2554
TKN, mg/l	43.8	6.1		8.9
Cyanide, mg/l	<1.0	<1.0		<1.0
Calcium, mg/l	465	18.75		11.65
Magnesium, mg/l	19.2	7.35		7.0
Aluminium, mg/l	7.5	1.0		0.5
Iron, mg/l	1050	26		2.0
Lead, mg/l	3.1	0.0		0.0
Total Dissol. Sol. mg/l	85218	792		488
Nitrate Nitrogen, mg/l	<1.0	<1.0		<1.0
Phosphates (DO_4), mg/l	2570	130		37
Sulphates, mg/l	6981	167.9		181.1
Chlorides, mg/l	1630	50		10
Fluorides, mg/l	1.5	0.8		0.6
MBAS, mg/l	<1.0	<1.0		<1.0
Detergents, mg/l	*	*		*

SENCO Industrial Waste Analyses

Sample I.D.	#3NCOFT. Purge	Tank Truck		
Date	11-8-77	11-8-77		
Time	12:48	12:53		
Temp. Degress F	121°	124°		
Volume, gal	1000	3000		
PH	12.9	12.9		
BOD_5, mg/1	1894	1206		
Tot. Susp. Slds, mg/1	2071	1460		
Cadmium, mg/1	0.2			
Zinc, mg/1	16.2			
Total Chromium, mg/1	2.8			
Hexavalent Chromium, mg/1	1.9			
Oil & Grease, mg/1	1984			
COD, mg/1	26,432			
TKN, mg/1	160			
Cyanide, mg/1	<1.0			
Calcium, mg/1				
Magnesium, mg/1	26.25			
Aluminium, mg/1	27.5			
Iron, mg/1	1200			
Lead, mg/1	1.45			
Total Dissol. Sol. mg/1	40553			
Nitrate Nitrogen, mg/1	<1.0			
Phosphates (DO_4), mg/1	2520			
Sulphates, mg/1	7248			
Chlorides, mg/1	380			
Fluorides, mg/1	1.3			
MBAS, mg/1	23			
Detergents, mg/1	*			

LIQUID WASTE ANALYSES SHEET

EQUIPMENT	DATE	TIME	TEMP.	VOLUME	PH	BOD	SS	TKH
...il Cleaner Tank	8/23	11:15	60°	100 gal.	5.85	SEE		
" Tank	8/23	11:15	86°	2000 gal.	5.90			
...il cleaner tank	8/25	3:00 AM	84°	1800 gal.	5.98	ATTACHED		
...il cleaner tank	8/25	3:00 AM	71°	1200 gal.	5.70			
... Tank	8/30	7:00 AM	84°	1600 gal.	5.98	SHEET		
... Tank	8/30	7:00 AM	85°	1600 gal.		FOR		
...il Cleaner	8/30	7:00 AM	105°	100 gal.	6.53	REMAINING		RESULTS
...ing Tank	8/30	7:00 AM	106°	100 gal.				

SENCO SAMPLING PROGRAM

ANALYTICAL RESULTS

Hexavalent Chromium	0.0	0.0	0.0	0.0	0.0	0.0
Total Chromium	0.3	0.3	0.4	0.5	0.2	1.1
Total Kjeldahl Nitrogen	744	816	732	1200	876	360
Cadmium	0.0	0.0	0.0	0.0	0.0	0.0
Zinc	5.0	4.8	2.5	18.7	0.7	28.5
Chemical Oxygen Demand	2240	14112	4301	19040	2240	19040
Oil, Wax and Grease	742	7947	1110	9490	1135	6156
Cyanide	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BOD_5	2394	2666	2515	2363	1959	2679
Total Suspended Solids	1056	4784	540	2824	640	2836
Date	8/23	8/23	8/25	8/25	8/30	8/30
Source	Tank Trk.	# 3 Mall Cle.	Tank Trk.	# 3 Mall Cle.	Tank Trk.	#3 Mall Cle.

ALL RESULTS ARE EXPRESSED IN mg/l

senco fastening systems

memorandum

senco products, inc. • 8485 broadwell rd. • cincinnati, ohio 45244 • (513) 474-3000

attention: Plant Engineering

date: September 30, 1977

from: Larry Bickel

subject: LIQUID TRASH DISPOSAL

Liquid trash disposal from 21st July through the 31st August:

July 21 -	6,000	gallons
22 -	5,000	"
23 -	3,000	"
25 -	6,000	"
26 -	6,000	"
27 -	5,000	"
28 -	6,000	"
29 -	5,000	"
30 -	3,000	"
August 1 -	3,000	"
2 -	3,000	"
3 -	6,000	"
4 -	5,000	"
5 -	3,000	"
6 -	3,000	"
8 -	3,000	"
9 -	3,000	"
10 -	6,000	"
11 -	3,000	"
12 -	5,000	"
13 -	3,000	"
15 -	3,000	"
16 -	6,000	"
17 -	6,000	"
18 -	5,000	"
19 -	5,000	"
20 -	3,000	"
22 -	3,000	"
23 -	3,000	"
24 -	6,000	"
25 -	6,000	"
26 -	6,000	"
27 -	3,000	"
29 -	3,000	"
30 -	3,000	"
31 -	9,000	"

Larry K. Bickel

LARRY K. BICKEL
BLD. & GROUNDS SUPT.

LB:gc

OHIO DEPARTMENT OF HEALTH
WATER QUALITY DATA

Date Received ______________________

Date Reported ______________________

Laboratory ______________________

Laboratory Number ______________________

Analyst ______________________

Station ______________________ Station Code [ ][ ][ ][ ][ ]

County ______________________

Collected by: ______________________ Phone:

Identification of Sample ______________________ Sample Code [ ]

Date of grab sample (or last date of composite sample): Year | Month | Day | Hour | Minute — Composite Type [ ][ ]

Sample Types: ☐ Ground Water ☐ Industrial ☐ Sewage ☐ Comp Mon ☐ Water Supply ☐ Stream

Beginning Date of Composite Sample: Year | Month | Day | C | Hour | Minute — Frequency [ ][ ]

Analysis to be Reported to: ☐ CO ☐ CDO ☐ SE ☐ NE ☐ SW ☐ NW

REASON FOR TAKING SAMPLE — ADDITIONAL INFORMATION — REMARKS BY ANALYST:
PRESERVATIVE:
- ☐ NaOH
- ☐ $CuSO_4$
- ☐ H_2SO_4
- ☐ HNO_3
- ☐ OTHER

☐ Regular (or indicate by checking boxes)			☐ Fluoride Diss. F	H1	mg/l	☐ Cyanide, CN	N1	mg/l
☐ Flow	Y2	CFS	☐ Calcium Total, Ca	H2	mg/l	☐ MBAS	N2	mg/l
☐ Water Temperature, Field	Y3	C°	☐ Magnesium Total, Mg	H3	mg/l	☐ Oil-Grease, Total	N3	mg/l
☐ pH, Field	Y4	S. U.	☐ Potassium Total, K	H4	mg/l	☐ Phenols	N4	ug/l
☐ Dissolved Oxygen, Field	Y5	mg/l	☐ Sodium Total, Na	H5	mg/l	☐ Tannin Lignin	N5	mg/l
☐ Hydrogen Sulfide, Field	Y6	mg/l	☐ Aluminum Total, Al	H6	ug/l	☐ Aldrin, Whl Smpl	N6	ug/l
☐ Chlorine Free Avl, Field	Y7	mg/l	☐ Antimony Total, Sb	H7	ug/l	☐ DDD, Whl Smpl	N7	ug/l
☐ Chlorine Tot Resd, Field	Y8	mg/l	☐ Arsenic Total, As	H8	ug/l	☐ DDE, Whl Smpl	N8	ug/l
☐ Color	Y9	Pt-Co	☐ Barium Total, Ba	H9	ug/l	☐ DDT, Whl Smpl	N9	ug/l
☐ Odor	Y0	T. N.	☐ Berylium Total, Be	H0	ug/l	☐ Dieldrin, Whl Smpl	N0	ug/l
☐ Turbidity	U1	FTU	☐ Bismuth Total, Bi	J1	ug/l	☐ Chlordane, Whl Smpl	M1	ug/l
☐ Conductivity at 25 C°	U2	U-MHO	☐ Boron Total, B	J2	ug/l	☐ Endrin, Whl Smpl	M2	ug/l
☐ pH, Lab	U3	S. U.	☐ Cadmium Total, Cd	J3	ug/l	☐ Heptachlor, Whl Smpl	M3	ug/l
☐ pH, $CaCO_3$ Stability	U4	S. U.	☐ Chromium Total, Cr	J4	ug/l	☐ Hchlr-Epoxide, Whl Smpl	M4	ug/l
☐ Alkalinity Total, $CaCO_3$	U5	mg/l	☐ Chromium Hex, Cr	J5	ug/l	☐ Lindane, Whl Smpl	M5	ug/l
☐ Alkalinity Phth. $CaCO_3$	U6	mg/l	☐ Cobalt Total, Co	J6	ug/l	☐ Methoxychlor, Whl Smpl	M6	ug/l
☐ Alkalinity, $CaCO_3$ Stabl	U7	mg/l	☐ Copper Total, Cu	J7	ug/l	☐ Malathion, Whl Smpl	M7	ug/l
☐ Carbon Dioxide, CO_2	U8	mg/l	☐ Iron Total, Fe	J8	ug/l	☐ Parathion, Whl Smpl	M8	ug/l
☐ Acidity Total, $CaCO_3$	U9	mg/l	☐ Iron Diss. Fe	J9	ug/l	☐ Methyl Parathn, Whl Smpl	M9	ug/l
☐ Acidity M.O., $CaCO_3$	U0	mg/l	☐ Iron Ferrous, Fe	J0	ug/l	☐ Beta, Total	M0	pc/l
☐ Hardness Total, $CaCO_3$	I1	mg/l	☐ Lead Total, Pb	K1	ug/l	☐ Beta, Diss	,1	pc/l
☐ Residue, Total	I2	mg/l	☐ Lithium Total, Li	K2	ug/l	☐ Beta, Suspd	,2	pc/l
☐ Residue, Total Volatile	I3	mg/l	☐ Manganese Total, Mn	K3	ug/l	☐ Alpha, Total	,3	pc/l
☐ Residue, Total Nflt (Sus)	I4	mg/l	☐ Mercury Total, Hg	K4	ug/l	☐ Alpha, Diss	,4	pc/l
☐ Residue, Vol Nflt	I5	mg/l	☐ Molybdenum Total, Mo	K5	ug/l	☐ Alpha, Suspd	,5	pc/l
☐ Residue, Total Flt (Diss)	I6	mg/l	☐ Nickel Total, Ni	K6	ug/l	☐ Radium 226, Total	,6	pc/l
☐ Residue, Vol Flt	I7	mg/l	☐ Selenium Total, Se	K7	ug/l	☐ Strontium 90, Total	,7	pc/l
☐ Residue, Settlable	I8	mg/l	☐ Silver Total, Ag	K8	ug/l	☐ Coliform Total, MF	,8	#/100ml
☐ Nitrogen Organic, N	I9	mg/l	☐ Strontium Total, Sr	K9	ug/l	☐ Coliform Total MPN, Conf	,9	#/100ml
☐ Nitrogen Ammonia, N	I0	mg/l	☐ Thallium Total, Tl	K0	ug/l	☐ Fecal Coli Total, MF	,0	#/100ml
☐ Nitrite, N	01	mg/l	☐ Tin Total, Sn	L1	ug/l	☐ Fecal Strep Total, MF	.1	#/100ml
☐ Nitrate, N	02	mg/l	☐ Titanium Total, Ti	L2	ug/l	☐ Plate Count, Total	.2	#/ml
☐ Phosphorus Total, P	03	mg/l	☐ Tungsten Total, T	L3	ug/l	☐ Algae, Total	.3	#/ml
☐ Phosphorus Soluble, P	04	mg/l	☐ Vanadium Total, V	L4	ug/l	☐ TOD	.4	mg/l
☐ Phosphate Total, PO_4	05	mg/l	☐ Zinc Total, Zn	L5	ug/l	☐ BHC	.5	ug/l
☐ Phosphate Ortho, PO_4	06	mg/l	☐ Zirconium Total, Zr	L6	ug/l	☐ TKN	.6	mg/l
☐ Sulfate, SO_4	07	mg/l	☐ BOD, 5-Day	L7	mg/l	☐ Conductivity, Field	.7	U-MHO
☐ Sulfite, SO_3	08	mg/l	☐ COD	L8	mg/l	☐		
☐ Sulfide, S	09	mg/l	☐ Chlorine Demand, 15 min	L9	mg/l	☐		
☐ Chloride, Cl	00	mg/l	☐ Carbon Total Org, C	L0	mg/l	☐		

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OHIO DEPARTMENT OF HEALTH
WATER QUALITY DATA

Date Received

Date Reported

Laboratory

Laboratory Number

Analyst

Station

Station Code

County

Collected by: Phone:

Identification of Sample

Sample Code

Date of grab sample (or last date of composite sample) — Year / Month / Day / Hour / Minute — Composite Type

Sample Types: ☐ Ground Water ☐ Industrial ☐ Sewage ☐ Comp Mon ☐ Water Supply ☐ Stream

Beginning Date of Composite Sample — Year / Month / Day / C / Hour / Minute — Frequency

Analysis to be Reported to: ☐ CO ☐ CDO ☐ SE ☐ NE ☐ SW ☐ NW

REASON FOR TAKING SAMPLE — ADDITIONAL INFORMATION — REMARKS BY ANALYST:

PRESERVATIVE:

- ☐ NaOH
- ☐ $CuSO_4$
- ☐ H_2SO_4
- ☐ HNO_3
- ☐ OTHER

☐ Regular (or indicate by checking boxes)			☐ Fluoride Diss. F	H1	mg/l	☐ Cyanide, CN	N1	mg/l
☐ Flow	Y2	CFS	☐ Calcium Total, Ca	H2	mg/l	☐ MBAS	N2	mg/l
☐ Water Temperature, Field	Y3	C°	☐ Magnesium Total, Mg	H3	mg/l	☐ Oil-Grease, Total	N3	mg/l
☐ pH, Field	Y4	S. U.	☐ Potassium Total, K	H4	mg/l	☐ Phenols	N4	ug/l
☐ Dissolved Oxygen, Field	Y5	mg/l	☐ Sodium Total, Na	H5	mg/l	☐ Tannin Lignin	N5	mg/l
☐ Hydrogen Sulfide, Field	Y6	mg/l	☐ Aluminum Total, Al	H6	ug/l	☐ Aldrin, Whl Smpl	N6	ug/l
☐ Chlorine Free Avl, Field	Y7	mg/l	☐ Antimony Total, Sb	H7	ug/l	☐ DDD, Whl Smpl	N7	ug/l
☐ Chlorine Tot Resd, Field	Y8	mg/l	☐ Arsenic Total, As	H8	ug/l	☐ DDE, Whl Smpl	N8	ug/l
☐ Color	Y9	Pt-Co	☐ Barium Total, Ba	H9	ug/l	☐ DDT, Whl Smpl	N9	ug/l
☐ Odor	Y0	T. N.	☐ Berylium Total, Be	H0	ug/l	☐ Dieldrin, Whl Smpl	N0	ug/l
☐ Turbidity	U1	FTU	☐ Bismuth Total, Bi	J1	ug/l	☐ Chlordane, Whl Smpl	M1	ug/l
☐ Conductivity at 25 C°	U2	U-MHO	☐ Boron Total, B	J2	ug/l	☐ Endrin, Whl Smpl	M2	ug/l
☐ pH, Lab	U3	S. U.	☐ Cadmium Total, Cd	J3	ug/l	☐ Heptachlor, Whl Smpl	M3	ug/l
☐ pH, $CaCO_3$ Stability	U4	S. U.	☐ Chromium Total, Cr	J4	ug/l	☐ Hchlr-Epoxide, Whl Smpl	M4	ug/l
☐ Alkalinity Total, $CaCO_3$	U5	mg/l	☐ Chromium Hex, Cr	J5	ug/l	☐ Lindane, Whl Smpl	M5	ug/l
☐ Alkalinity Phth, $CaCO_3$	U6	mg/l	☐ Cobalt Total, Co	J6	ug/l	☐ Methoxychlor, Whl Smpl	M6	ug/l
☐ Alkalinity, $CaCO_3$ Stabl	U7	mg/l	☐ Copper Total, Cu	J7	ug/l	☐ Malathion, Whl Smpl	M7	ug/l
☐ Carbon Dioxide, CO_2	U8	mg/l	☐ Iron Total, Fe	J8	ug/l	☐ Parathion, Whl Smpl	M8	ug/l
☐ Acidity Total, $CaCO_3$	U9	mg/l	☐ Iron Diss, Fe	J9	ug/l	☐ Methyl Parathn, Whl Smpl	M9	ug/l
☐ Acidity M.O., $CaCO_3$	U0	mg/l	☐ Iron Ferrous, Fe	J0	ug/l	☐ Beta, Total	M0	pc/l
☐ Hardness Total, $CaCO_3$	I1	mg/l	☐ Lead Total, Pb	K1	ug/l	☐ Beta, Diss	,1	pc/l
☐ Residue, Total	I2	mg/l	☐ Lithium Total, Li	K2	ug/l	☐ Beta, Suspd	,2	pc/l
☐ Residue, Total Volatile	I3	mg/l	☐ Manganese Total, Mn	K3	ug/l	☐ Alpha, Total	,3	pc/l
☐ Residue, Total Nflt (Sus)	I4	mg/l	☐ Mercury Total, Hg	K4	ug/l	☐ Alpha, Diss	,4	pc/l
☐ Residue, Vol Nflt	I5	mg/l	☐ Molybdenum Total, Mo	K5	ug/l	☐ Alpha, Suspd	,5	pc/l
☐ Residue, Total Flt (Diss)	I6	mg/l	☐ Nickel Total, Ni	K6	ug/l	☐ Radium 226, Total	,6	pc/l
☐ Residue, Vol Flt	I7	mg/l	☐ Selenium Total, Se	K7	ug/l	☐ Strontium 90, Total	,7	pc/l
☐ Residue, Settlable	I8	mg/l	☐ Silver Total, Ag	K8	ug/l	☐ Coliform Total, MF	,8	#/100ml
☐ Nitrogen Organic, N	I9	mg/l	☐ Strontium Total, Sr	K9	ug/l	☐ Coliform Total MPN, Conf	,9	#/100ml
☐ Nitrogen Ammonia, N	I0	mg/l	☐ Thallium Total, Tl	K0	ug/l	☐ Fecal Coli Total, MF	,0	#/100ml
☐ Nitrite, N	01	mg/l	☐ Tin Total, Sn	L1	ug/l	☐ Fecal Strep Total, MF	.1	#/100ml
☐ Nitrate, N	02	mg/l	☐ Titanium Total, Ti	L2	ug/l	☐ Plate Count, Total	.2	#/ml
☐ Phosphorus Total, P	03	mg/l	☐ Tungsten Total, T	L3	ug/l	☐ Algae, Total	.3	#/ml
☐ Phosphorus Soluble, P	04	mg/l	☐ Vanadium Total, V	L4	ug/l	☐ TOD	.4	mg/l
☐ Phosphate Total, PO_4	05	mg/l	☐ Zinc Total, Zn	L5	ug/l	☐ BHC	.5	ug/l
☐ Phosphate Ortho, PO_4	06	mg/l	☐ Zirconium Total, Zr	L6	ug/l	☐ TKN	.6	mg/l
☐ Sulfate, SO_4	07	mg/l	☐ BOD, 5-Day	L7	mg/l	☐ Conductivity, Field	.7	U-MHO
☐ Sulfite, SO_3	08	mg/l	☐ COD	L8	mg/l	☐		
☐ Sulfide, S	09	mg/l	☐ Chlorine Demand, 15 min	L9	mg/l	☐		
☐ Chloride, Cl	00	mg/l	☐ Carbon Total Org, C	L0	mg/l	☐		

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Identification of Sample

Sample Code

Date of grab sample (or last date of composite sample) — Year Month Day Hour Minute

Composite Type

Sample Types: ☐ Ground Water ☐ Industrial ☐ Sewage ☐ Comp Mon ☐ Water Supply ☐ Stream

Beginning Date of Composite Sample — Year Month Day C Hour Minute

Frequency

Analysis to be Reported to: ☐ CO ☐ CDO ☐ SE ☐ NE ☐ SW ☐ NW

REASON FOR TAKING SAMPLE — ADDITIONAL INFORMATION — REMARKS BY ANALYST:

PRESERVATIVE:

- ☐ NaOH
- ☐ $CuSO_4$
- ☐ H_2SO_4
- ☐ HNO_3
- ☐ OTHER

☐ Regular (or indicate by checking boxes)			☐ Fluoride Diss. F	H1	mg/l	☐ Cyanide, CN	N1	mg/l
☐ Flow	Y2	CFS	☐ Calcium Total, Ca	H2	mg/l	☐ MBAS	N2	mg/l
☐ Water Temperature, Field	Y3	C°	☐ Magnesium Total, Mg	H3	mg/l	☐ Oil-Grease, Total	N3	mg/l
☐ pH, Field	Y4	S. U.	☐ Potassium Total, K	H4	mg/l	☐ Phenols	N4	ug/l
☐ Dissolved Oxygen, Field	Y5	mg/l	☐ Sodium Total, Na	H5	mg/l	☐ Tannin Lignin	N5	mg/l
☐ Hydrogen Sulfide, Field	Y6	mg/l	☐ Aluminum Total, Al	H6	ug/l	☐ Aldrin, Whl Smpl	N6	ug/l
☐ Chlorine Free Avl, Field	Y7	mg/l	☐ Antimony Total, Sb	H7	ug/l	☐ DDD, Whl Smpl	N7	ug/l
☐ Chlorine Tot Resd, Field	Y8	mg/l	☐ Arsenic Total, As	H8	ug/l	☐ DDE, Whl Smpl	N8	ug/l
☐ Color	Y9	Pt-Co	☐ Barium Total, Ba	H9	ug/l	☐ DDT, Whl Smpl	N9	ug/l
☐ Odor	Y0	T. N.	☐ Berylium Total, Be	H0	ug/l	☐ Dieldrin, Whl Smpl	N0	ug/l
☐ Turbidity	U1	FTU	☐ Bismuth Total, Bi	J1	ug/l	☐ Chlordane, Whl Smpl	M1	ug/l
☐ Conductivity at 25 C°	U2	U-MHO	☐ Boron Total, B	J2	ug/l	☐ Endrin, Whl Smpl	M2	ug/l
☐ pH, Lab	U3	S. U.	☐ Cadmium Total, Cd	J3	ug/l	☐ Heptachlor, Whl Smpl	M3	ug/l
☐ pH, $CaCO_3$ Stability	U4	S. U.	☐ Chromium Total, Cr	J4	ug/l	☐ Hchlr-Epoxide, Whl Smpl	M4	ug/l
☐ Alkalinity Total, $CaCO_3$	U5	mg/l	☐ Chromium Hex, Cr	J5	ug/l	☐ Lindane, Whl Smpl	M5	ug/l
☐ Alkalinity Phth, $CaCO_3$	U6	mg/l	☐ Cobalt Total, Co	J6	ug/l	☐ Methoxychlor, Whl Smpl	M6	ug/l
☐ Alkalinity, $CaCO_3$ Stabl	U7	mg/l	☐ Copper Total, Cu	J7	ug/l	☐ Malathion, Whl Smpl	M7	ug/l
☐ Carbon Dioxide, CO_2	U8	mg/l	☐ Iron Total, Fe	J8	ug/l	☐ Parathion, Whl Smpl	M8	ug/l
☐ Acidity Total, $CaCO_3$	U9	mg/l	☐ Iron Diss. Fe	J9	ug/l	☐ Methyl Parathn, Whl Smpl	M9	ug/l
☐ Acidity M.O., $CaCO_3$	U0	mg/l	☐ Iron Ferrous, Fe	J0	ug/l	☐ Beta, Total	M0	pc/l
☐ Hardness Total, $CaCO_3$	I1	mg/l	☐ Lead Total, Pb	K1	ug/l	☐ Beta, Diss	,1	pc/l
☐ Residue, Total	I2	mg/l	☐ Lithium Total, Li	K2	ug/l	☐ Beta, Suspd	,2	pc/l
☐ Residue, Total Volatile	I3	mg/l	☐ Manganese Total, Mn	K3	ug/l	☐ Alpha, Total	,3	pc/l
☐ Residue, Total Nflt (Sus)	I4	mg/l	☐ Mercury Total, Hg	K4	ug/l	☐ Alpha, Diss	,4	pc/l
☐ Residue, Vol Nflt	I5	mg/l	☐ Molybdenum Total, Mo	K5	ug/l	☐ Alpha, Suspd	,5	pc/l
☐ Residue, Total Flt (Diss)	I6	mg/l	☐ Nickel Total, Ni	K6	ug/l	☐ Radium 226, Total	,6	pc/l
☐ Residue, Vol Flt	I7	mg/l	☐ Selenium Total, Se	K7	ug/l	☐ Strontium 90, Total	,7	pc/l
☐ Residue, Settlable	I8	mg/l	☐ Silver Total, Ag	K8	ug/l	☐ Coliform Total, MF	,8	#/100ml
☐ Nitrogen Organic, N	I9	mg/l	☐ Strontium Total, Sr	K9	ug/l	☐ Coliform Total MPN, Conf	,9	#/100ml
☐ Nitrogen Ammonia, N	I0	mg/l	☐ Thallium Total, Tl	K0	ug/l	☐ Fecal Coli Total, MF	,0	#/100ml
☐ Nitrite, N	01	mg/l	☐ Tin Total, Sn	L1	ug/l	☐ Fecal Strep Total, MF	.1	#/100ml
☐ Nitrate, N	02	mg/l	☐ Titanium Total, Ti	L2	ug/l	☐ Plate Count, Total	.2	#/ml
☐ Phosphorus Total, P	03	mg/l	☐ Tungsten Total, T	L3	ug/l	☐ Algae, Total	.3	#/ml
☐ Phosphorus Soluble, P	04	mg/l	☐ Vanadium Total, V	L4	ug/l	☐ TOD	.4	mg/l
☐ Phosphate Total, PO_4	05	mg/l	☐ Zinc Total, Zn	L5	ug/l	☐ BHC	.5	ug/l
☐ Phosphate Ortho, PO_4	06	mg/l	☐ Zirconium Total, Zr	L6	ug/l	☐ TKN	.6	mg/l
☐ Sulfate, SO_4	07	mg/l	☐ BOD, 5-Day	L7	mg/l	☐ Conductivity, Field	.7	U-MHO
☐ Sulfite, SO_3	08	mg/l	☐ COD	L8	mg/l	☐		
☐ Sulfide, S	09	mg/l	☐ Chlorine Demand, 15 min	L9	mg/l	☐		
☐ Chloride, Cl	00	mg/l	☐ Carbon Total Org. C	L0	mg/l	☐		

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OHIO DEPARTMENT OF HEALTH
WATER QUALITY DATA

Date Received

Date Reported

Laboratory

Laboratory Number

Analyst

Station

Station Code

County

Collected by:

Phone:

Identification of Sample

Sample Code

Date of grab sample (or last date of composite sample) — Year | Month | Day | Hour | Minute

Composite Type

Sample Types: ☐ Ground Water ☐ Industrial ☐ Sewage ☐ Comp Mon ☐ Water Supply ☐ Stream

Beginning Date of Composite Sample — Year | Month | Day | C | Hour | Minute

Frequency

Analysis to be Reported to: ☐ CO ☐ CDO ☐ SE ☐ NE ☐ SW ☐ NW

REASON FOR TAKING SAMPLE — ADDITIONAL INFORMATION — REMARKS BY ANALYST:

PRESERVATIVE:

- ☐ NaOH
- ☐ $CuSO_4$
- ☐ H_2SO_4
- ☐ HNO_3
- ☐ OTHER

☐ Regular (or indicate by checking boxes)			☐ Fluoride Diss, F	H1	mg/l	☐ Cyanide, CN	N1	mg/l
☐ Flow	Y2	CFS	☐ Calcium Total, Ca	H2	mg/l	☐ MBAS	N2	mg/l
☐ Water Temperature, Field	Y3	C°	☐ Magnesium Total, Mg	H3	mg/l	☐ Oil-Grease, Total	N3	mg/l
☐ pH, Field	Y4	S. U.	☐ Potassium Total, K	H4	mg/l	☐ Phenols	N4	ug/l
☐ Dissolved Oxygen, Field	Y5	mg/l	☐ Sodium Total, Na	H5	mg/l	☐ Tannin Lignin	N5	mg/l
☐ Hydrogen Sulfide, Field	Y6	mg/l	☐ Aluminum Total, Al	H6	ug/l	☐ Aldrin, Whl Smpl	N6	ug/l
☐ Chlorine Free Avl, Field	Y7	mg/l	☐ Antimony Total, Sb	H7	ug/l	☐ DDD, Whl Smpl	N7	ug/l
☐ Chlorine Tot Resd, Field	Y8	mg/l	☐ Arsenic Total, As	H8	ug/l	☐ DDE, Whl Smpl	N8	ug/l
☐ Color	Y9	Pt-Co	☐ Barium Total, Ba	H9	ug/l	☐ DDT, Whl Smpl	N9	ug/l
☐ Odor	Y0	T. N.	☐ Beryllium Total, Be	H0	ug/l	☐ Dieldrin, Whl Smpl	N0	ug/l
☐ Turbidity	U1	FTU	☐ Bismuth Total, Bi	J1	ug/l	☐ Chlordane, Whl Smpl	M1	ug/l
☐ Conductivity at 25 C°	U2	U-MHO	☐ Boron Total, B	J2	ug/l	☐ Endrin, Whl Smpl	M2	ug/l
☐ pH, Lab	U3	S. U.	☐ Cadmium Total, Cd	J3	ug/l	☐ Heptachlor, Whl Smpl	M3	ug/l
☐ pH, $CaCO_3$ Stability	U4	S. U.	☐ Chromium Total, Cr	J4	ug/l	☐ Hchlr-Epoxide, Whl Smpl	M4	ug/l
☐ Alkalinity Total, $CaCO_3$	U5	mg/l	☐ Chromium Hex, Cr	J5	ug/l	☐ Lindane, Whl Smpl	M5	ug/l
☐ Alkalinity Phth, $CaCO_3$	U6	mg/l	☐ Cobalt Total, Co	J6	ug/l	☐ Methoxychlor, Whl Smpl	M6	ug/l
☐ Alkalinity, $CaCO_3$ Stabl	U7	mg/l	☐ Copper Total, Cu	J7	ug/l	☐ Malathion, Whl Smpl	M7	ug/l
☐ Carbon Dioxide, CO_2	U8	mg/l	☐ Iron Total, Fe	J8	ug/l	☐ Parathion, Whl Smpl	M8	ug/l
☐ Acidity Total, $CaCO_3$	U9	mg/l	☐ Iron Diss, Fe	J9	ug/l	☐ Methyl Parathn, Whl Smpl	M9	ug/l
☐ Acidity M.O., $CaCO_3$	U0	mg/l	☐ Iron Ferrous, Fe	J0	ug/l	☐ Beta, Total	M0	pc/l
☐ Hardness Total, $CaCO_3$	I1	mg/l	☐ Lead Total, Pb	K1	ug/l	☐ Beta, Diss	,1	pc/l
☐ Residue, Total	I2	mg/l	☐ Lithium Total, Li	K2	ug/l	☐ Beta, Suspd	,2	pc/l
☐ Residue, Total Volatile	I3	mg/l	☐ Manganese Total, Mn	K3	ug/l	☐ Alpha, Total	,3	pc/l
☐ Residue, Total Nflt (Sus)	I4	mg/l	☐ Mercury Total, Hg	K4	ug/l	☐ Alpha, Diss	,4	pc/l
☐ Residue, Vol Nflt	I5	mg/l	☐ Molybdenum Total, Mo	K5	ug/l	☐ Alpha, Suspd	,5	pc/l
☐ Residue, Total Flt (Diss)	I6	mg/l	☐ Nickel Total, Ni	K6	ug/l	☐ Radium 226, Total	,6	pc/l
☐ Residue, Vol Flt	I7	mg/l	☐ Selenium Total, Se	K7	ug/l	☐ Strontium 90, Total	,7	pc/l
☐ Residue, Settlable	I8	mg/l	☐ Silver Total, Ag	K8	ug/l	☐ Coliform Total, MF	,8	#/100ml
☐ Nitrogen Organic, N	I9	mg/l	☐ Strontium Total, Sr	K9	ug/l	☐ Coliform Total MPN, Conf	,9	#/100ml
☐ Nitrogen Ammonia, N	I0	mg/l	☐ Thallium Total, Tl	K0	ug/l	☐ Fecal Coli Total, MF	,0	#/100ml
☐ Nitrite, N	01	mg/l	☐ Tin Total, Sn	L1	ug/l	☐ Fecal Strep Total, MF	.1	#/100ml
☐ Nitrate, N	02	mg/l	☐ Titanium Total, Ti	L2	ug/l	☐ Plate Count, Total	.2	#/ml
☐ Phosphorus Total, P	03	mg/l	☐ Tungsten Total, T	L3	ug/l	☐ Algae, Total	.3	#/ml
☐ Phosphorus Soluble, P	04	mg/l	☐ Vanadium Total, V	L4	ug/l	☐ TOD	.4	mg/l
☐ Phosphate Total, PO_4	05	mg/l	☐ Zinc Total, Zn	L5	ug/l	☐ BHC	.5	ug/l
☐ Phosphate Ortho, PO_4	06	mg/l	☐ Zirconium Total, Zr	L6	ug/l	☐ TKN	.6	mg/l
☐ Sulfate, SO_4	07	mg/l	☐ BOD, 5-Day	L7	mg/l	☐ Conductivity, Field	.7	U-MHO
☐ Sulfite, SO_3	08	mg/l	☐ COD	L8	mg/l	☐		
☐ Sulfide, S	09	mg/l	☐ Chlorine Demand, 15 min	L9	mg/l	☐		
☐ Chloride, Cl	00	mg/l	☐ Carbon Total Org, C	L0	mg/l	☐		

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Senco Products

3 Nailwashers with phosphoric acid which goes to a tank truck which hauls to constructed pits on hillside – ~~[illegible]~~ 1200 gallon discharg 3 times per day ?!? Each small washer is 250 gallons dumped every two weeks.

check?

Lagoons 2 ft deep by 50 foot square – 3 lagoons

Coolant – periodically dumped into tank truck

Sanitary waste goes thru package plant to stream behind plant.

Plant 2 – Sanitary waste only.

alternate disposal methods:

1) Pristine wastewater treatment
~~Hamilton~~ Metropolitan Sewer District
2) has incinerator for industrial waste
3) Combination of above
4) Pretreatment & NPDES discharge

FILE

June 8, 1976

Re: Senco Products, Incorporated
Hamilton County
Industrial Wastewater

Southwest District Office
7 East Fourth Street
Dayton, Ohio 45402

Mr. Roy Straub, Plant Engineer
Senco Products
Broadwell Road
Cincinnati, Ohio 45244

Dear Mr. Straub:

Thank you for meeting with Mr. Richard Carlton and myself on May 19, 1976. Also attending the meeting were Mr. Paul Kock of W. E. Gates and Associates, Mr. Tony DiPuccio of KZF and Associates, and Mr. Charles Duckett of Hamilton County Health Department.

One of the purposes of the meeting was to inspect each of your two (2) wastewater treatment plants. Following are summaries of Mr. Carlton's observations:

<u>SENCO #1</u>:

The sewage treatment plant was discharging an effluent of fairly good visual quality at the time of this inspection. The only noticeable deficiency was that it contained a mild concentration of suspended solids in the form of very small floc-like particles of sludge which were not being captured in the settling tank. There were noticeable deposits of sludge (dark grey in color) in the creek to which this plant discharges.

Recent monthly operating reports show the effluent suspended solids concentrations ranging from 60 to 176 mg/l as monthly averages, with maximum single values in the 200 to 300 mg/l range. All of these indicate a level of plant performance lower than that of which we consider appropriate for a plant of this type.

We suspect that the continual discharge of deburring slurry to the plant has an adverse effect on its performance in that it probably overloads the plant with inert suspended solids. This could lead to the noted increased level of suspended solids in the plant effluent; not all of which are inert, as evidenced by the occurrence of high effluent BOD values when suspended solids levels are high.

The history of sewage flowrates through the plant should also be reviewed to determine if excessive hydraulic flows could be occurring and contributing to the discharges of sludge from the plant.

The expected level of performance for a plant of this type is that the monthly average values for both effluent BOD and suspended solids should be less than 30 mg/l.

<u>SENCO #2</u>:

The sewage treatment plant was discharging an effluent of fairly good visual quality. The tertiary treatment filter was noticeably improving the appearance of the effluent by removing fine suspended solids that were contained in the discharge from the secondary treatment plant settling tank.

A comparison of recent monthly operating reports for the two Senco wastewater treatment plants reveals that the #2 plant consistently produces an effluent of better quality than the #1 plant, with occassional exceptions when the tertiary treatment unit is apparently bypassed.

The expected levels of performance for a plant of this type are that the monthly average values for BOD should not exceed 10 mg/l, and that those for suspended solids should not exceed 12 mg/l.

Generally the plant has met the expected level with regard to BOD, but not with regard to suspended solids.

As we discussed, this office is in the process of preparing NPDES permits for your two (2) manufacturing facilities. I will discuss with you these permits and the requirements contained in them prior to their being issued for public notice.

We also discussed your course of action with respect to the waste lagoons. It is my understanding that KZF and Associates is conducting a ground water survey to determine the impact the lagoons have on the ground water.

Mr. Roy Straub
June 8, 1976
Page 2

Mr. Tony DiPuccio and Mr. Heinrich Zehetmaier of KZF met with Mr. Jeff Hosler, Staff Geologist from this office and myself to discuss possible ground water monitoring programs. Please notify me when you receive the results of the KZF study.

If you have additional information, questions, or comments, please feel free to contact me at this office.

Sincerely,

David W. Renfrew, P.E.
Industrial Wastewater Group

DWR/sjg

cc: Charles Duckett, Hamilton County Health Department

OHIO DEPARTMENT OF HEALTH
WATER QUALITY DATA

Date Received ____________________ Laboratory Number ____________________

Date Reported ____________________ Laboratory ____________________ Analyst ____________________

Station ____________________ Station Code ☐☐☐☐☐ County ____________________

Collected by: ____________________ Phone: ____________________

Identification of Sample ____________________ Sample Code ☐

Date of grab sample (or last date of composite sample): Year | Month | Day | Hour | Minute — Composite Type ☐☐

Sample Types: ☐ Ground Water ☐ Industrial ☐ Sewage ☐ Comp Mon ☐ Water Supply ☐ Stream

Beginning Date of Composite Sample: Year | Month | Day | C | Hour | Minute — Frequency ☐☐

Analysis to be Reported to: ☐ CO ☐ CDO ☐ SE ☐ NE ☐ SW ☐ NW

REASON FOR TAKING SAMPLE — ADDITIONAL INFORMATION — REMARKS BY ANALYST:

PRESERVATIVE:
- ☐ NaOH
- ☐ $CuSO_4$
- ☐ H_2SO_4
- ☐ HNO_3
- ☐ OTHER

Parameter	Code	Unit	Parameter	Code	Unit	Parameter	Code	Unit
☐ Regular (or indicate by checking boxes)			☐ Fluoride Diss. F	H1	mg/l	☐ Cyanide, CN	N1	mg/l
☐ Flow	Y2	CFS	☐ Calcium Total, Ca	H2	mg/l	☐ MBAS	N2	mg/l
☐ Water Temperature, Field	Y3	C°	☐ Magnesium Total, Mg	H3	mg/l	☐ Oil-Grease, Total	N3	mg/l
☐ pH, Field	Y4	S. U.	☐ Potassium Total, K	H4	mg/l	☐ Phenols	N4	ug/l
☐ Dissolved Oxygen, Field	Y5	mg/l	☐ Sodium Total, Na	H5	mg/l	☐ Tannin Lignin	N5	mg/l
☐ Hydrogen Sulfide, Field	Y6	mg/l	☐ Aluminum Total, Al	H6	ug/l	☐ Aldrin, Whl Smpl	N6	ug/l
☐ Chlorine Free Avl, Field	Y7	mg/l	☐ Antimony Total, Sb	H7	ug/l	☐ DDD, Whl Smpl	N7	ug/l
☐ Chlorine Tot Resd, Field	Y8	mg/l	☐ Arsenic Total, As	H8	ug/l	☐ DDE, Whl Smpl	N8	ug/l
☐ Color	Y9	Pt-Co	☐ Barium Total, Ba	H9	ug/l	☐ DDT, Whl Smpl	N9	ug/l
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☐ Conductivity at 25 C°	U2	U-MHO	☐ Boron Total, B	J2	ug/l	☐ Endrin, Whl Smpl	M2	ug/l
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☐ pH, $CaCO_3$ Stability	U4	S. U.	☐ Chromium Total, Cr	J4	ug/l	☐ Hchlr-Epoxide, Whl Smpl	M4	ug/l
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☐ Acidity Total, $CaCO_3$	U9	mg/l	☐ Iron Diss, Fe	J9	ug/l	☐ Methyl Parathn, Whl Smpl	M9	ug/l
☐ Acidity M.O., $CaCO_3$	U0	mg/l	☐ Iron Ferrous, Fe	J0	ug/l	☐ Beta, Total	M0	pc/l
☐ Hardness Total, $CaCO_3$	I1	mg/l	☐ Lead Total, Pb	K1	ug/l	☐ Beta, Diss	,1	pc/l
☐ Residue, Total	I2	mg/l	☐ Lithium Total, Li	K2	ug/l	☐ Beta, Suspd	,2	pc/l
☐ Residue, Total Volatile	I3	mg/l	☐ Manganese Total, Mn	K3	ug/l	☐ Alpha, Total	,3	pc/l
☐ Residue, Total Nflt (Sus)	I4	mg/l	☐ Mercury Total, Hg	K4	ug/l	☐ Alpha, Diss	,4	pc/l
☐ Residue, Vol Nflt	I5	mg/l	☐ Molybdenum Total, Mo	K5	ug/l	☐ Alpha, Suspd	,5	pc/l
☐ Residue, Total Flt (Diss)	I6	mg/l	☐ Nickel Total, Ni	K6	ug/l	☐ Radium 226, Total	,6	pc/l
☐ Residue, Vol Flt	I7	mg/l	☐ Selenium Total, Se	K7	ug/l	☐ Strontium 90, Total	,7	pc/l
☐ Residue, Settlable	I8	mg/l	☐ Silver Total, Ag	K8	ug/l	☐ Coliform Total, MF	,8	#/100ml
☐ Nitrogen Organic, N	I9	mg/l	☐ Strontium Total, Sr	K9	ug/l	☐ Coliform Total MPN, Conf	,9	#/100ml
☐ Nitrogen Ammonia, N	I0	mg/l	☐ Thallium Total, Tl	K0	ug/l	☐ Fecal Coli Total, MF	,0	#/100ml
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☐ Nitrate, N	02	mg/l	☐ Titanium Total, Ti	L2	ug/l	☐ Plate Count, Total	.2	#/ml
☐ Phosphorus Total, P	03	mg/l	☐ Tungsten Total, T	L3	ug/l	☐ Algae, Total	.3	#/ml
☐ Phosphorus Soluble, P	04	mg/l	☐ Vanadium Total, V	L4	ug/l	☐ TOD	.4	mg/l
☐ Phosphate Total, PO_4	05	mg/l	☐ Zinc Total, Zn	L5	ug/l	☐ BHC	.5	ug/l
☐ Phosphate Ortho, PO_4	06	mg/l	☐ Zirconium Total, Zr	L6	ug/l	☐ TKN	.6	mg/l
☐ Sulfate, SO_4	07	mg/l	☐ BOD, 5-Day	L7	mg/l	☐ Conductivity, Field	.7	U-MHO
☐ Sulfite, SO_3	08	mg/l	☐ COD	L8	mg/l	☐		
☐ Sulfide, S	09	mg/l	☐ Chlorine Demand, 15 min	L9	mg/l	☐		
☐ Chloride, Cl	00	mg/l	☐ Carbon Total Org, C	L0	mg/l	☐		

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Hamilton Co. 71

Charles Forsthoff, Chief, Southwest District Office   January 15, 1976

Donald E. Day, P.E., Chief, Office of Land Pollution Control, Central Office

Hamilton County, SENCO lagoons

RECEIVED

MAY 5 - 1977

Ohio Environmental Protection Agency
SOUTHWEST DISTRICT

The purpose of this IOC is to transmit to you the information I have on the SENCO Lagoons, Anderson Twp., Hamilton County.

On December 19, 1975, the Director informed me that he had checked (by helicopter) the height of the Anderson Twp. Sanitary Landfill, operated by Gene Martin, and had observed lagoons to the south. Reportedly, the lagoons appeared to contain industrial wastes. The Director spotted the lagoons on a topo map. A copy of the map was delivered to your office by Joe Moore.

I have had a number of conversations with your staff on this subject. The latest phone call was from Elmer Ream on January 12, 1976. According to Elmer, Pete Eberly, Senco Risk Manager, has stated that there are three materials in the lagoons:

1 - 90% of the material is spent phosphoric acid with a pH of 5 to 6. About 5000 gal/day are discharged to the lagoons.

2 - A small volume of a caustic floor cleaner solution

3 - About 500 gal/week of coolant, presumably water-soluble oils are also discharged to the lagoon.

It is my understanding that Jeff Hosler will make a study of the geological characteristics of the area in an attempt to determine if ground waters might be polluted by the lagoons.

I suggest that samples be collected for chemical analysis. I'm sure that Elmer will be able to determine parameters to be checked. My own guess indicates that information should be obtained on presence of soluble salts. I would guess that the sludge would contain iron phosphate, manganese phosphate and zinc phosphate. Elmer will probably add some others.

In any event, the Director is anxious to know what is in the lagoons, whether they are legal and environmentally acceptable and what your office intends to do about the matter.

I appreciate your staff keeping me posted on progress--Thanks.

DED/pd

cc: Andy Turner

COMPLAINT IN' ESTIGATION FO..M

DATE/TIME REPORTED: 1/3/94 9:15 am

DISTRICT OFFICE SWDO

COMPLAINANT:

Name: Ron Loebker

Address:

Phone No.: wk 891-0677
H 531-9047

*Confidential Status: Y/N

Comments:

SUSPECTED SOURCE:

Name/Facility: Senco Products

Address: 8485 Broadwell Rd.
Cincinnati, OH

County: Hamilton

Phone No.: 388-2998

Stream Affected: trib. of Little Miami

STATEMENT OF COMPLAINT: *(Location, type of material, quantity, areas affected, phone #'s)*

The stream on Senco's property contains heavy grey matter with long filamentous strands choking the stream. He noted this over the weekend.

COMPLAINT RECEIVED BY: Diana Zimmerman

INVESTIGATION SUMMARY: *(Use separate summary sheet if handled by district)*

INVESTIGATOR ASSIGNED: MARY OSIKA

INVESTIGATION DATE: 1/3/94

ACTIONS/OBSERVATIONS/RECOMMENDATIONS: I called Senco (Bob Schmidt) to get an update on installation of treatment system. They are ahead of schedule, trying to get it on line by May. I called the complaintant & relayed this which satisfied him.

OHIO ENVIRONMENTAL PROTECTION AGENCY

TELEPHONE MEMORANDUM

DATE: September 21, 1993 CONTACTED US (X)

TIME: 9:37 a.m. WAS CONTACTED ( )

WITH: Mark Phair & Bob Schmidt

ENTITY: SENCO

PHONE: 513-388-2998

SUBJECT: Hydrogeologic Investigation

OEPA STAFF: Steve Lowry, DDAGW, GW, SWDO

==

NOTES AND SUMMARY:

Mr. Phair and Mr. Schmidt returned my call of 9-21-93 (8:30 a.m.). We discussed SENCO's lagoon for their wastewater system. This conversation was a continuation of our 9-20-93 discussion. I informed Mr. Phair that the DWPC was not going to require ground water monitoring for the lagoon. I explained to them that to fulfill the requirements of paragraph 13-m (Hydrogeologic Site Investigation) of the PTI application, they should conduct a file search for the adjoining Anderson Township Landfill (DSIWM) and Heekin Can (DHWM) facilities to obtain any available hydrogeologic information (i.e. depth to bedrock). We discussed what they need to submit (i.e. soil borings logged by a qualified geologist, water table depth, etc.). They indicated that they would fax me a copy of the proposed boring locations and that they were going to install monitoring wells to evaluate the depth to the water table.

SIGNATURE ______________________

/nys

cc: Mary Osika, DWPC, SWDO

721-50-74-3

senco fastening systems

PETER A. EBERLE
Corporate Risk Manager

senco products inc
8485 broadwell rd
cincinnati • ohio 45244
(513) 474-3000

world's largest producer of industrial air staplers nailers and tackers

August 30, 1989 RE: PAVING FORMER XYLOL UST PIT

Anthony J. Muto
Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

Dear Mr. Muto:

This letter is in response to Rich Hertlein's questions concerning the paving of the former Xylol underground storage tank (UST) pit, and the duration for which Senco would have to operate their vapor recovery system.

Senco can pave the area immediately. The pavement should not adversely affect the vapor recovery process and, therefore, would not pose any problem. This does not eliminate the possibility of installation of additional probes, borings, or other excavations; but these actions, with the exception of excavation, could probably be done without destroying the pavement.

Senco is expected to operate the vapor recovery system until contaminant concentrations are below detection limits for detection methods dictated in SW846 for Ethyl Benzine and total Xylenes in soil. This information cannot be assessed from the concentration of vapors in the recovery system exhaust and must be obtained from confirmatory soil samples.

If you have any questions, please call Mike Proffitt at (513) 449-6357.

Sincerely,

Rich Bendula
Unit Supervisor
Division of Groundwater

SENCO®

FASTENING SYSTEMS

Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244
513-388-2000

RECEIVED
AUG 07 1989
Environmental Protection Agency
... DISTRICT

July 27, 1989

Mr. Richard Bendula
Supervisor
Groundwater Division
Ohio EPA
40 S. Main Street
Dayton, OH 45202

RE: **REMEDIATION OF XYLOL SPILL--**
SENCO PRODUCTS, INC.

Dear Mr. Bendula:

Pursuant to SENCO's Remedial Action Plan (RAP) for the xylol spill, I am submitting to you a report on the progress made with respect to the RAP.

Section 5 of the RAP, Future Remedial Actions, sets forth SENCO's plan for remediation of the site in question. This section is found at pages 20-23 of the RAP. Also, as the report indicated, it was estimated that 200 gallons of xylol was not recovered on the day of the spill, December 16, 1988. However, an undetermined quantity of the 200 gallons very likely evaporated during the 30 day time period that the 300 cubic yards of soil was spread on an asphalt pad for aeration. The soil vapor extraction system has now been operating for approximately four months, for the time period of March of 1989 through the present time. During that time period, SENCO has maintained daily records of the temperature, flow, and VOC concentration of the gas stream from the soil vapor extraction system. Attached to this letter are copies of the reports recording the information.

You will note that, over the four month time period, a total of approximately 59 gallons have been removed from the soil through the vapor extraction system. In addition, the VOC concentrations, as measured and recorded, over the same time period, have progressively and significantly diminished. In March, the VOC concentrations ranged from 50 to 145 ppm. During the month of June, the concentration levels had dropped to a range of 6-33 ppm. Although you do not have the July report, our records show that through the first part of July, the concentrations had dropped again to levels ranging from 3-10 ppm.

In addition to the soil vapor extraction system, SENCO also installed a groundwater monitoring well using PEI Associates as the consultant and ATEC Associates as the subcontractor. Attached are the boring log and the construction log for this stainless steel well which reached a level of 40 feet.

Soil samples were taken at 5 foot intervals, beginning at 15 feet. These samples were screened for VOC concentrations, using an Hnu detector. Concentration levels were found in the range of 2-7 ppm. Two of the samples were submitted to confirm the Hnu readings.

In addition, a water sample was taken and analyzed by PEI Associates, Inc. Attached are the sample results. As the attached analysis results show, neither xylene nor ethyl benzene was detected in the water sample.

As I have discussed with you, during my review of the records in your office for the Anderson Township Landfill, operated by Rumpke, I noted that Rumpke had two groundwater wells installed down gradient from SENCO's property. These two wells, situated along Broadwell Road, are approximately 100-150 yards from the location of the groundwater monitoring well installed by SENCO. As I discussed with you, we would propose that SENCO continue to monitor our well at the same time intervals as the Rumpke groundwater wells are monitored and sampled. The results can be compared to give a reading of the three wells all located down gradient from the site of the xylol spill. Our proposal is that we use these three groundwater wells to serve the purpose of monitoring the SENCO xylol spill location.

I ask that you please review the attached documents and the contents of this letter. I would welcome the opportunity to discuss this matter in more detail with you. Among the issues we discussed, we should talk about the appropriate next actions on both the soil vapor extraction system and the groundwater monitoring well. With the concentration levels in the soil at a level of less than 10 ppm, we would propose that we target a concentration level which, when consistently achieved, would trigger SENCO's discontinuation of the soil vapor extraction system activity at the site.

I look forward to hearing from you.

Sincerely,

SENCO PRODUCTS, INC.

Anthony J. Muto
Corporate Attorney and
Secretary
(513) 388-2914

AJM/lw
2191w

Soil Vapor Extraction System MARCH 1989

Date	Time	Vac. Gage (" W.C.) A	B	C	Tot Hyd (ppm)		Ambient Temp.(F)	Exh. Flow (cfm)	Lbs. Solv Exhaust
1									
2									
3	11:30	29	29	42	150			194	11.58
4						OFF			0.00
5						OFF			0.00
6						OFF			0.00
7	14:05	34	34	46	145		30	194	11.20
8	13:25	32	32	45	145		38	194	11.20
9	13:33	31	31	45	140		44	194	10.81
10	13:56	31	31	44	140		56	194	10.81
11					137.5	EST		194	10.62
12					137.5	EST		194	10.62
13	14:52	30	30	44	135		61	194	10.42
14	13:20	30	30	43	130		70	194	10.04
15	14:30	31	31	45	100		47	194	7.72
16	15:05	30	30	44	100		60	194	7.72
17	14:50	30	30	43	92		75	194	7.10
18					73.5	EST		194	5.68
19					73.5	EST		194	5.68
20						OFF			0.00
21						OFF			0.00
22	13:35	32	32	48	55		42	194	4.25
23	15:40	31	31	45	72		61	194	5.56
24					84	EST		194	6.49
25					84	EST		194	6.49
26					84	EST		194	6.49
27	16:37	30	30	44	96		78	194	7.41
28	13:15	30	30	44	95		84	194	7.34
29						OFF			0.00
30	11:30	40	40	55	51		63	194	3.94
31						OFF			
					TOTAL SOLVENT REMOVED (LBS.)				179.15

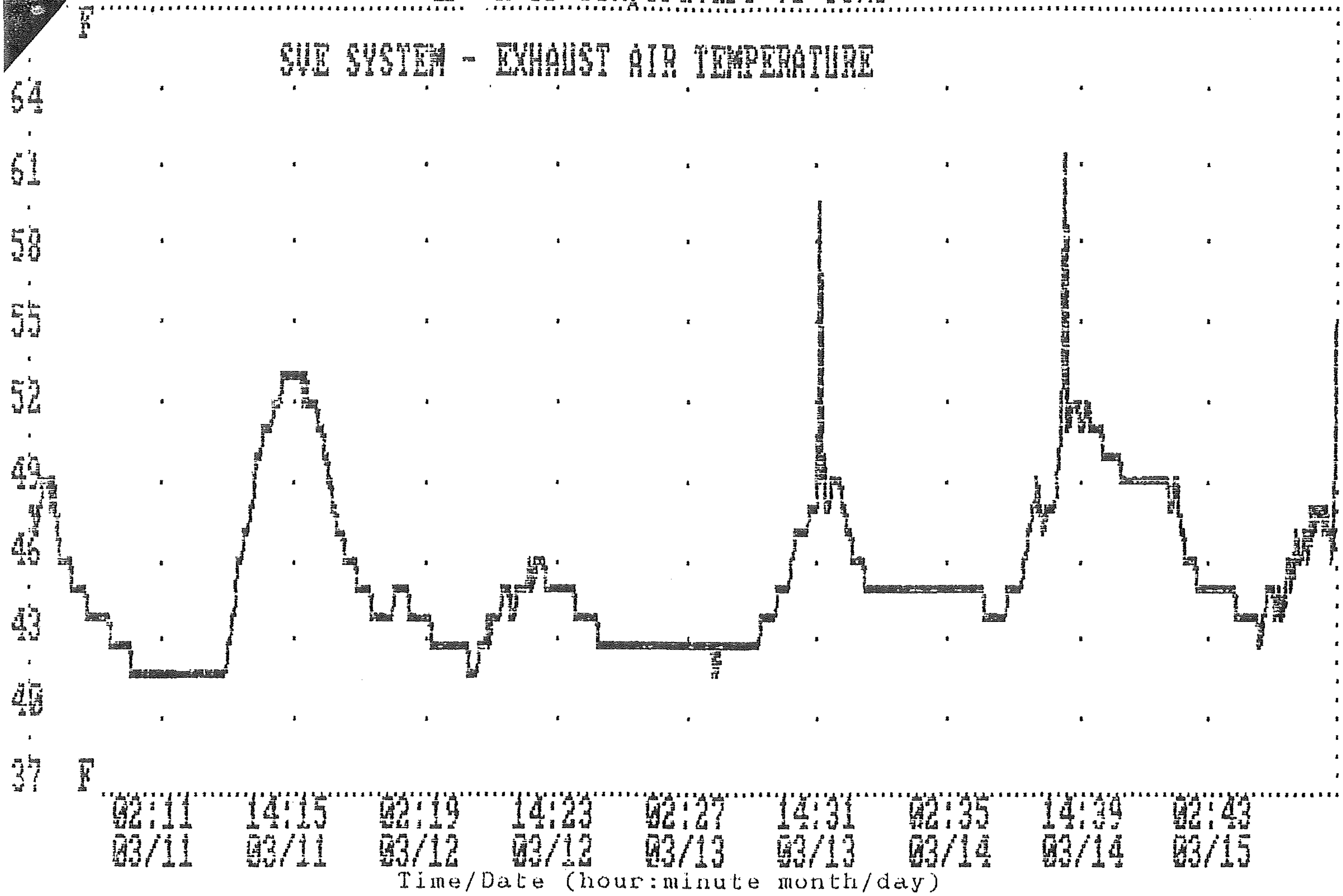
ASSUMPTIONS:

1. Solvent exhaust weight calculations use the daily PPM reading and assume this number to be the mean level of the interval between readings.

2. Total hydrocarbon readings taken each business day. PPM estimates for the days when no readings are taken are the average of the readings before and after.

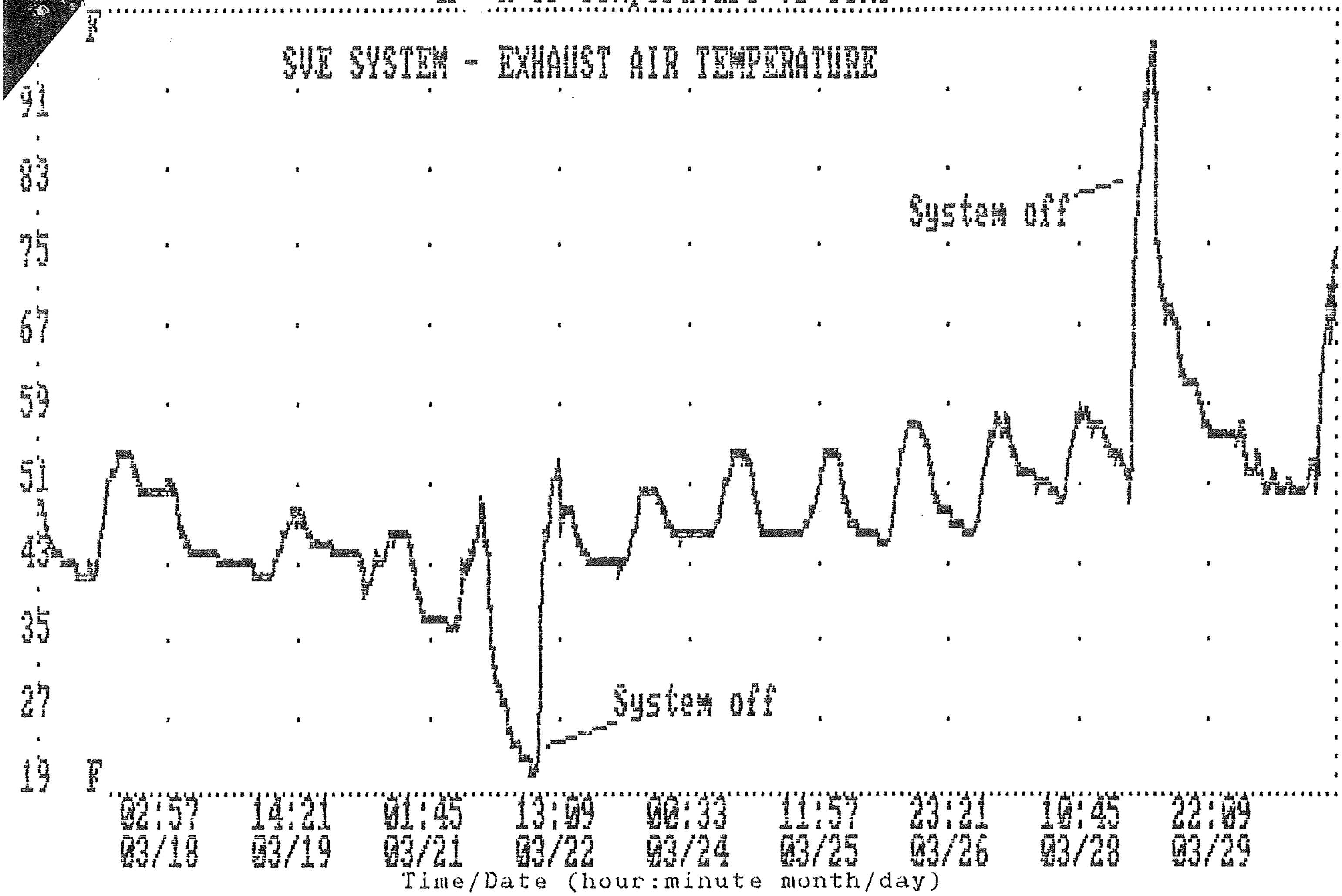
3. PPM readings are taken with a Foxboro Century OVA Model 128GC. Air velocity measurements are made with an Alnor Velometer.

Gr h of Temperature vs Time



Line	Filename	Graph Title
	SVEMAR1	SVE1

Gr h of Temperature vs Time



Line	Filename	Graph Title
	SVEMAR	SOIL VAPORSYSTEM - EXHAUST AIR TEMP

Soil Vapor Extraction System APRIL 1989

Date	Time	Vac. Gage (" W.C.) A	B	C	Tot Hyd (ppm)	Ambient Temp.(F)	Exh. Flow (cfm)	Lbs. Solv Exhaust
1								
2								
3	13:30	33	33	48	72	68	194	5.56
4	13:45	33	33	47	36	66	194	2.78
5	10:35	33	33	47	48	54	194	3.71
6	13:00	30	30	44	47	53	194	3.63
7	10:15	30	30	44	52	43	194	4.02
8					55		194	4.25
9					55		194	4.25
10	12:45	30	30	44	59	38	194	4.56
11	10:05	30	30	42	53	35	194	4.09
12	14:15	29	29	44	53	62	194	4.09
13	13:05	30	30	45	51	49	194	3.94
14	14:20	30	30	44	59	69	194	4.56
15					58		194	4.48
16					58		194	4.48
17	12:50	29	29	44	57	72	194	4.40
18	13:55	30	30	45	52	57	194	4.02
19	10:35	34	34	48	30	48	194	2.32
20	9:50	32	32	46	47	47	194	3.63
21	13:05	31	31	45	53	75	194	4.09
22					52		194	4.02
23					52		194	4.02
24	13:35	30	30	44	52	76	194	4.02
25	14:05	30	30	44	49	86	194	3.78
26	13:15	32	32	45	52	84	194	4.02
27								0.00
28								0.00
29	13:05	15	15	35				0.00
30								0.00

TOTAL SOLVENT REMOVED (LBS.) 96.68

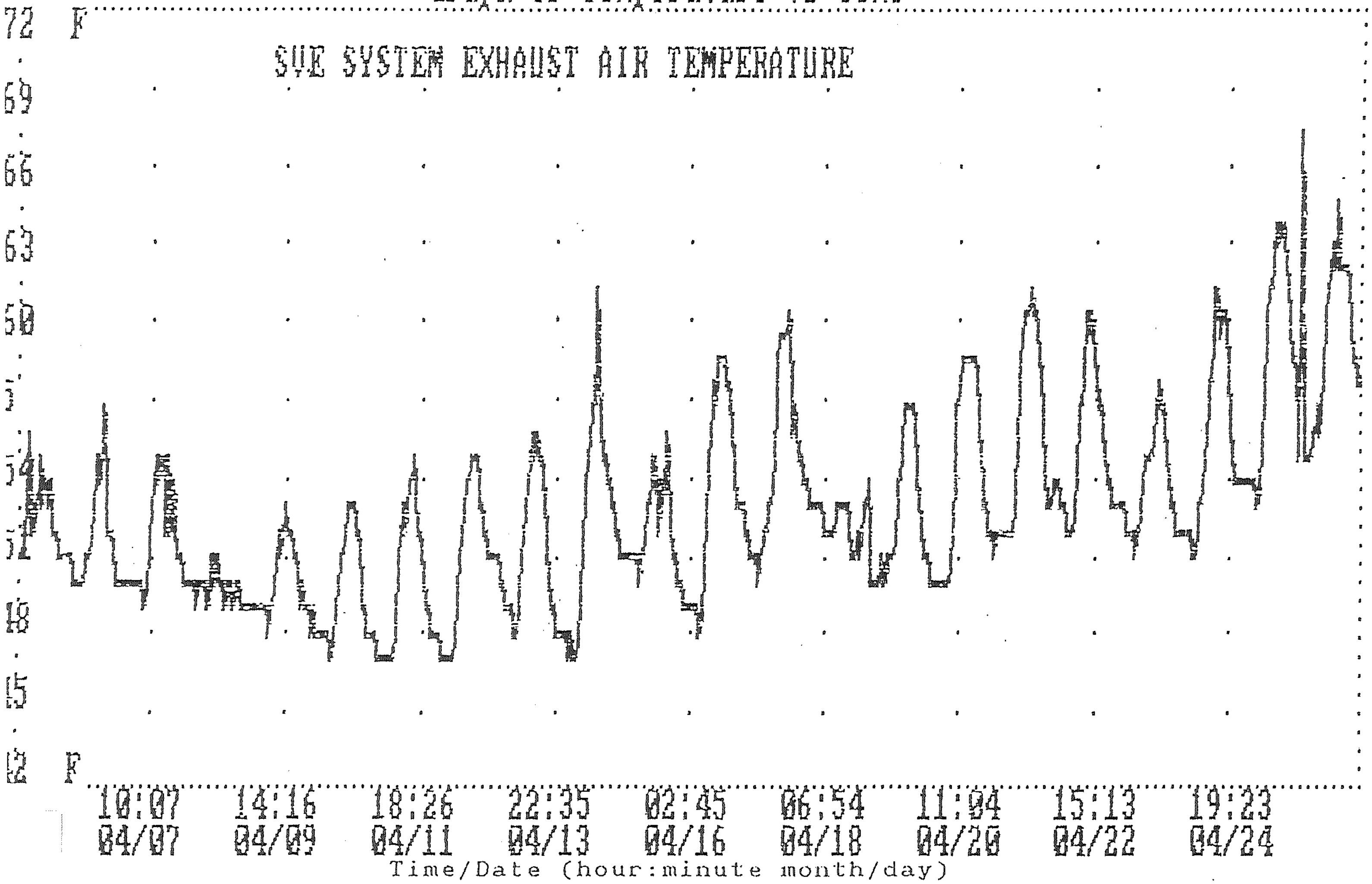
ASSUMPTIONS:

1. Solvent exhaust weight calculations use the daily PPM reading and assume this number to be the mean level of the interval between readings.

2. Total hydrocarbon readings taken each business day. PPM estimates for the days when no readings are taken are the average of the readings before and after.

3. PPM readings are taken with a Foxboro Century OVA Model 128GC. Air velocity measurements are made with an Alnor Velometer.

Graph of Temperature vs Time



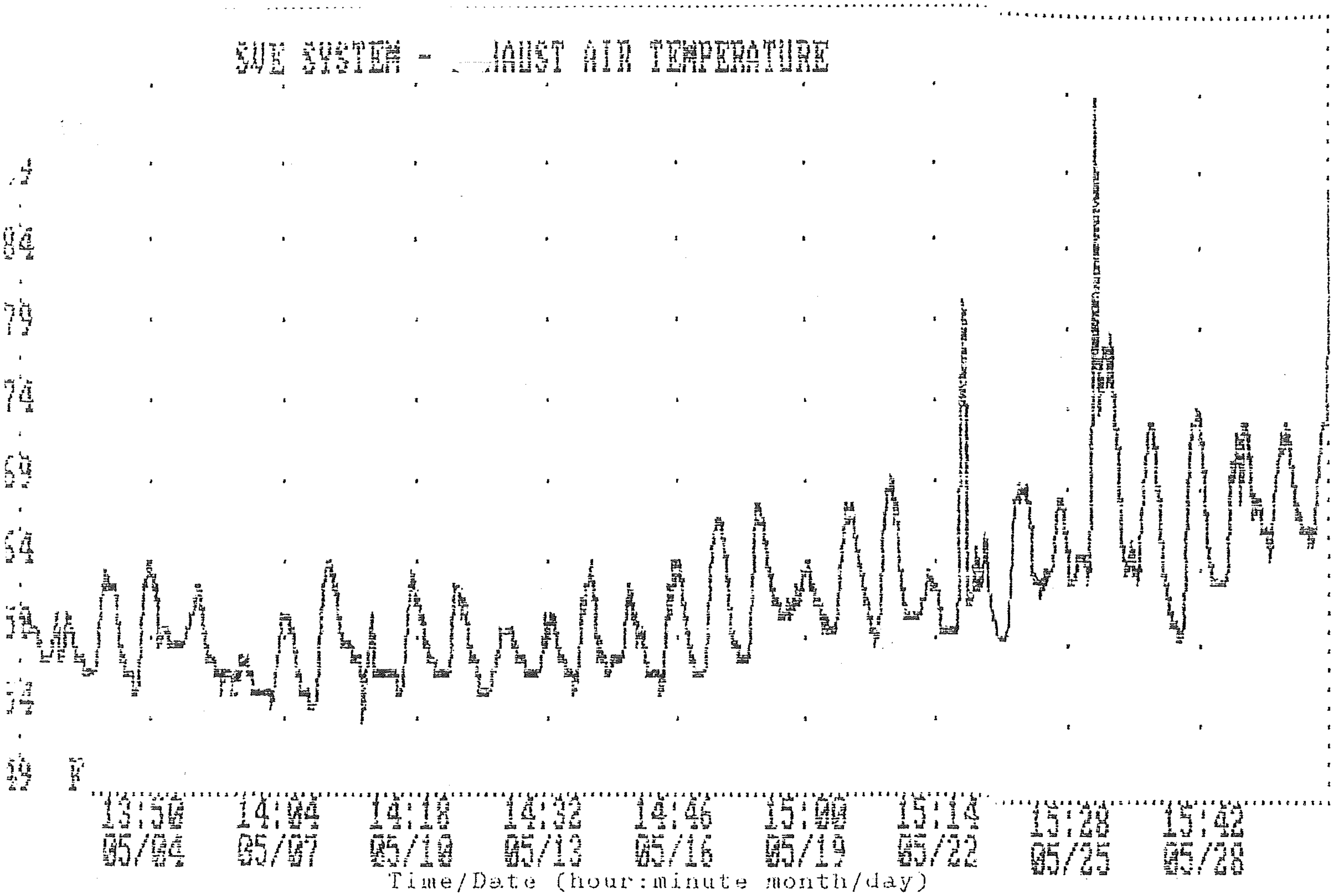
Line	Filename	Graph Title
	SVEAPR	SVE SYSTEM

Soil Vapor Extraction System MAY 1989

Date	Time	Vac. Gage (" W.C.) A	B	C	Tot Hyd (ppm)	Ambient Temp.(F)	Exh. Flow (cfm)	Hours Op	Lbs. Solv Exhaust
1	13:20	RESTART SYSTEM					0	0	0.00
2	13:45	34	34	49	25	59	194	0	0.00
3	11:25	30	30	45	38	62	194	21.5	2.63
4	13:45	30	30	44	43	74	194	26.5	3.67
5	13:00	32	32	45	33	68	194	23.25	2.47
6					38.5		194	24	2.97
7					38.5		194	24	2.97
8	13:10	30	30	44	44	62	194	24	3.40
9	8:00	SYSTEM SHUT DOWN - RAIN					194	0	0.00
10	13:10	RESTART SYSTEM						0	0.00
10	13:15	32	32	45	28	62	0	0	0.00
11	13:10	31	31	45	40	62	194	24	3.09
12	13:40	30	30	45	43	59	194	24.5	3.39
13					41.5		194	24	3.20
14					41.5		194	24	3.20
15	7:35	SYSTEM SHUT DOWN - RAIN					194	0	0.00
16	7:45	RESTART SYSTEM					194	0	0.00
16	13:30	31	31	45	40	71		5.25	0.00
17	14:55	30	30	45	41	63	194	25.5	3.36
18					37.5		194	24	2.90
19					37.5		194	24	2.90
20					37.5		194	24	2.90
21					37.5		194	24	2.90
22	8:45	30	30	45	34	86	194	18	1.97
23	7:45	SYSTEM SHUT DOWN - RAIN					194	23	0.00
23	14:20	RESTART SYSTEM						0	0.00
23	14:25	38	38	52	16	69		0	0.00
24	14:35	32	32	46	24	82	194	24	1.85
25	11:40	31	31	45	34	86	194	21	2.30
26	7:30	SYSTEM SHUT DOWN - RAIN						0	0.00
27								0	0.00
28								0	0.00
29								0	0.00
30	7:45	RESTART SYSTEM					194	0	0.00
30	15:25	30	30	45	29	89	194	7.5	0.70
31	15:45	30	30	45	35	92	194	24	2.70
					TOTAL SOLVENT REMOVED (LBS.)				52.06

SSUMPTIONS:

. Solvent exhaust weight calculations use the daily PPM reading and assume this number to be the mean level of the interval between readings.
. Total hydrocarbon readings taken each business day. PPM estimates for the days when no readings are taken are the average of the readings before and after.
. PPM readings are taken with a Foxboro Century OVA Model 128GC. Air velocity measurements are made with an Alnor Velometer.



Line	Filename	Graph Title
	SVEMAY	SVE SYSTEM EXHAUST AIR TEMPERATURE

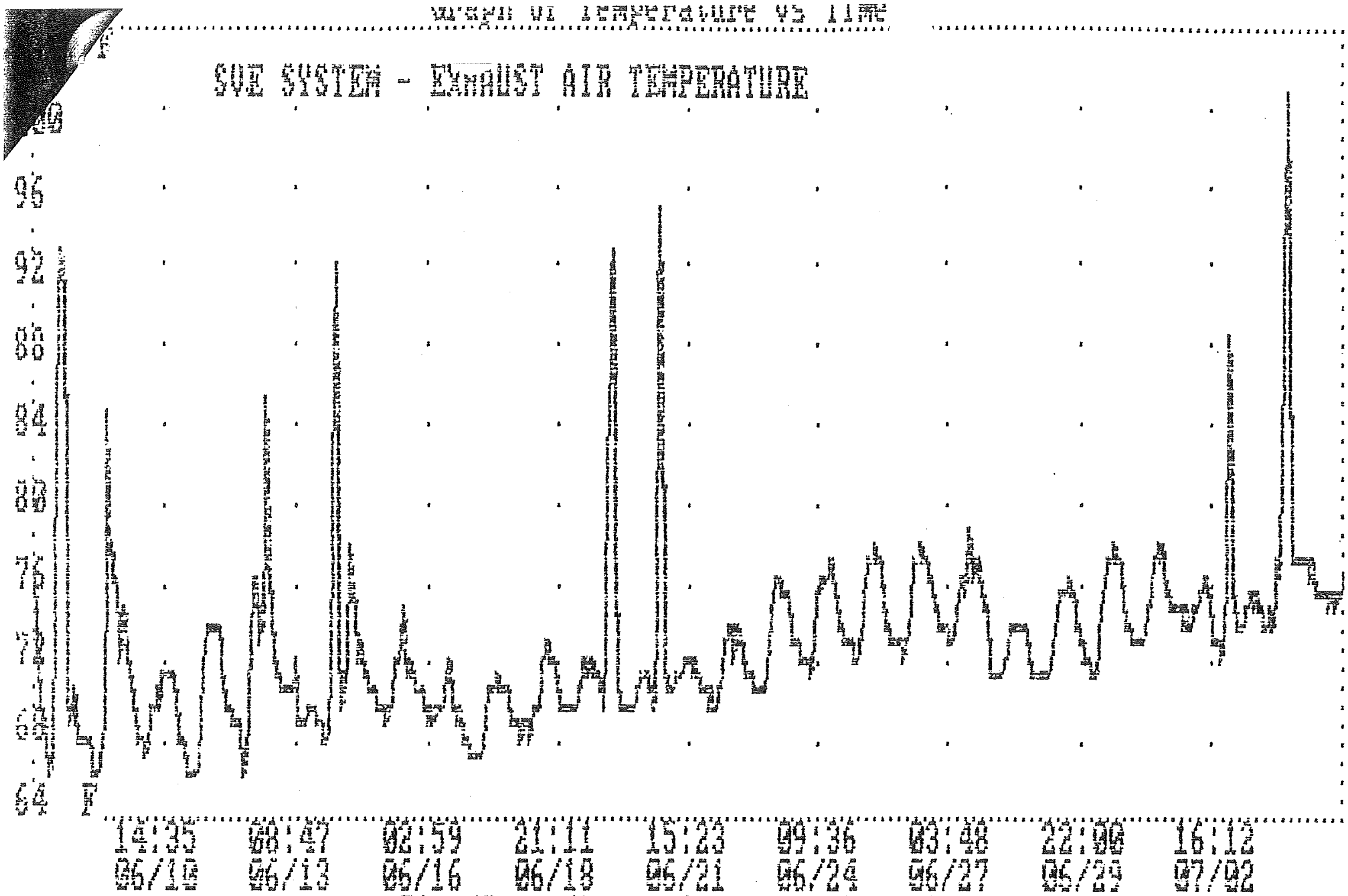
Soil Vapor Extraction System JUNE 1989

Date	Time	Vac. Gage (" W.C.) A	B	C	Tot Hyd (ppm)	Ambient Temp.(F)	Exh. Flow (cfm)	Hours Op	Lbs. Solv Exhaust
1									0.00
2	1450	30	30	45	38	85	194	47	5.75
3					33		194	24	2.55
4					33		194	24	2.55
5	745	SHUT DOWN - RAIN			33		194	16	1.70
6	750	35	35	50	0			0	0.00
7	1245	35	35	50	28	80	194	29	2.61
8	1345	34	34	50	26	88	194	25	2.09
9	745	SHUT DOWN - RAIN			23.5 EST		194	14	1.06
10								0	0.00
11								0	0.00
12								0	0.00
13	845	START UP						0	0.00
14	735	SHUT DOWN - RAIN			23.5 EST		194	23	1.74
15								0	0.00
16	1540	START UP						0	0.00
17					23.5 EST		194	24	1.81
18					23.5 EST		194	24	1.81
19	1315	32	32	46	21	82	194	21.5	1.45
20					13.45 EST		194	24	1.04
21	1600	32	32	50	5.9	85	194	26.5	0.50
22					9.45 EST		194	24	0.73
23	1410	33	33	48	13	91	194	22	0.92
24					16.25 EST		194	24	1.25
25					16.25 EST		194	24	1.25
26					16.25 EST		194	24	1.25
27	1405	30	30	46	19.5		194	24	1.31
28	1533	32	32	54	11.5		194	25.5	0.94
29	930	32	32	49	12.25 EST		194	18	0.71
30	1450	32	32	48	13	90	194	29	1.21
					TOTAL SOLVENT REMOVED (LBS.)				36.45

ASSUMPTIONS:

1. Solvent exhaust weight calculations use the daily PPM reading and assume this number to be the mean level of the interval between readings.
2. Total hydrocarbon readings taken each business day. PPM estimates for the days when no readings are taken are the average of the readings before and after.
3. PPM readings are taken with a Foxboro Century OVA Model 128GC. Air velocity measurements are made with an Alnor Velometer.

Graph of Temperature vs Time



Line	Filename	Graph Title
	SVEJUN	SVEJUNE

BORING SAMPLE LOG

Project No: 8828 Date: 4-10-89

Boring No: 1 Client: Sencorp

Drilling Method: HSA Driller: ATEC

Location: Plant #2 Prepared By: D. Plummer

Sample			Description
Number	Depth, ft	Type/Blow Count	
	0 - 15	no sample	poorly sorted sand and gravel
nw-1-15-16.5	15 - 16.5	splitspoon	coarse sand and gravel, dry
nw-20-21.5	20-21.5	splitspoon	fine sand and clay moist
nw-25-26.5	25-26.5	split spoon	poorly sorted sand, dry
nw-30-31.5	30-31.5	splitspoon	poorly sorted sand, wet
nw-35-36.5	35-36.5	splitspoon	poorly sorted sand, wet
nw-40-41.5	40-41.5	splitspoon	poorly sorted sand, wet
			water encountered @ approximately 33 ft

WELL CONSTRUCTION LOG

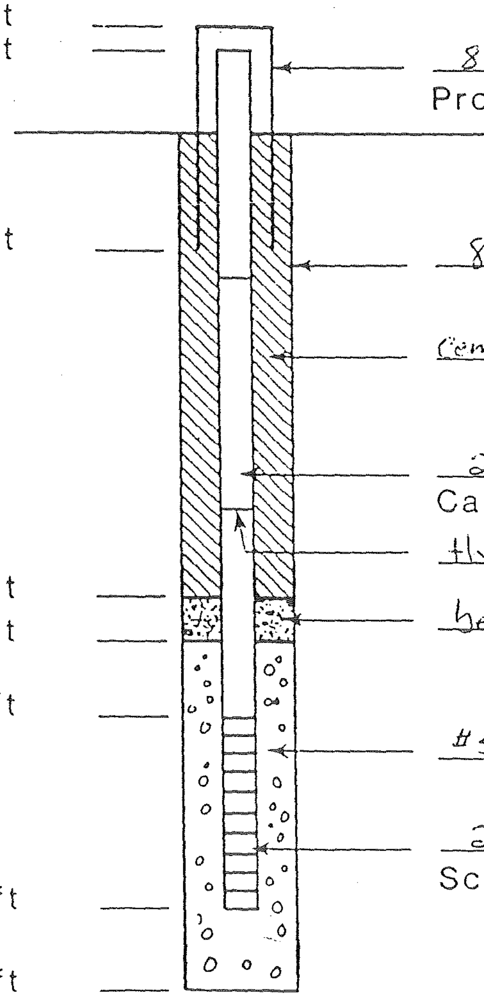
Project No: 8828 Completion Date: 4-10-89

Well No: MW-1 Client: Sencorp

Drilling Method: HSA Driller: ATEC

Land Surface Elevation: ______

Measuring Point Elevation: ______ Depth to Water: (Static) 28.21 ft



0 ft

0 ft

8 -in. steel flush mount Protective Casing

1 ft

8 -in. Borehole

cement Grout

2 -in. stainless Casing

threaded Joints

27 ft

28 ft

bentonite plug

30 ft

#5 washed quartz

2 -in. stainless Screen (0.010 Slot)

40 ft

40 ft

NOT TO SCALE

PEI Analytical Services

CLIENT:	Sencorp 8485 Broadwell Cincinnati, Ohio 45244	PROJECT:	8775
		REQ:	T9-04-077
		RECEIVED:	04/12/89
		FILE:	T904077E
ATTN:	Mr. Anthony Muto, Esq.		
		DATE REPORTED:	04/13/89
MATRIX:	WATER		

Analyte Concentration, Ug/l (PPB)

Sample ID	PEI No.	Ethyl Benzene	Xylenes
Water MW-1	T904077-01	ND	ND

ND= Not Detected (<5 Ug/l)

Approved By:

H. William Jess
Organic Laboratory
Supervisor

RAB/mam

Rich,
Returning this
to you. Jim C.

File SENCO
LUST
Hamilton County
DGW

February 6, 1989

06 1989
...ental Protection
... DISTRICT

Mr. Richard Bendula
Supervisor
Groundwater Division
OEPA/SWDO
40 South Main Street
Dayton, Ohio 45402

RE: Remediation of Xylol Spill at
SENCO Products, Inc. Site

Dear Mr. Bendula:

Enclosed is a copy of Senco Products, Inc.'s Remedial Action Plan for the xylol spill which occurred on December 16, 1988 at our plant on Broadwell Road. As you know, you and I agreed that the submission date for this RAP would be Monday, February 6, 1989.

If you have any questions, just call.

Sincerely,

SENCORP

Anthony J. Muto/mco

Anthony J. Muto
Corporate Attorney and
Assistant Secretary
(513) 388-2914

AJM/ls
Enclosure

REMEDIAL ACTION PLAN
FOR XYLOL SPILL AT
SENCO PRODUCTS, INC. PLANT
8450 BROADWELL ROAD
ANDERSON TOWNSHIP, OHIO

Prepared for

Sencorp
8485 Broadwell Road
Cincinnati, Ohio 45246

February 6, 1989

CONTENTS

Section		Page
1	Background	1
2	Site Setting and Hydrogeology	7
	Setting	7
	Geology	8
	Hydrology and water resources	9
3	Probable Impact of Xylol Spill	11
4	Remedial Actions Through February 6, 1989	18
5.	Future Remedial Actions	20
	Active Vapor Recovery System	20
	System Design	20
	Monitoring	22
	In-Situ Bioreclamation	23
6.	Final Report	24
7.	Conclusions	25
Appendix A	Laboratory Results of Liquid and Soil Sampling on December 16, 1988	A-1
Appendix B	Borings Logs	B-1

SECTION 1

BACKGROUND

During the week of December 12, 1988, SENCO Products, Inc. (SENCO) initiated removal of an underground storage tank containing xylol (i.e., a xylene solvent mixture) at SENCO's Broadwell Road plant. The plant is located in an industrial area of Anderson Township, Ohio. The xylol tank had not been used since late 1982. At that time, based on measurements taken, SENCO's records show that the tank contained approximately 16 inches of liquid. Subsequent measurements of liquid level indicated that the level in the tank remained the same as that indicated in late 1982. The tank level was measured as recently as two weeks prior to the tank removal and then again on the day on which the tank was removed. With each of these measurements, the results showed that there was no measurable change in the fluid level in the tank.

The contractor retained by SENCO to remove the tank was Petro Environmental Technologies (PET). On December 15, 1988, PET removed all overburden and backfill materials around the tank. At that time, the water phase of the liquid in the tank was pumped out. It was determined that, of the approximate 600 gallons of liquid in the tank, approximately 300 gallons of the liquid was water. Following the removal of the water phase from the xylol tank, PET tilted the tank while it was still in the excavation pit and rested the tank at an angle in the excavation at the end of the work day on December 15. The tilted tank was left in the excavation pit overnight on December 15.

At the beginning of the work day on the morning of December 16, it was determined that the remaining contents of the xylol tank had been released from the tank since the end of the December 16 workday, with the exception of approximately 20 gallons. Immediate action was taken by PET to pump liquid out of the excavation pit and out of the soil. It was estimated that approximately 100 gallons of the fluid was removed from the pit and the soil. An estimated maximum of 200 gallons of the xylol was not recovered at that point in time. After the tank was removed from the excavation pit, PET immediately commenced excavation of the soil in the pit. Excavation continued until it was no longer practical due to the growing size of the hole and the proximity of the sides of the excavation pit to existing utility and water lines. The depth of excavation was approximately 14 feet. During this excavation process, the water table was not reached.

As soon as it was determined that the liquid that was released from the tank was xylol and was a reportable quantity of the material, the appropriate local, state and federal authorities were notified promptly, as required.

It has been determined that the liquid that was released from the tank contained exclusively xylenes and ethylbenzene, both of which are non-chlorinated organics that readily biodegrade in the environment. These compounds were identified in the tank fluid and fluid in the excavation, and in the backfill/soil material tested. A comparison of the chromatographs of the liquid in the tank and the liquid from the release indicated that the two fluids were of the same origin (Appendix A).

Following the removal of the tank from the excavation pit, one small hole was identified in the bottom of the tank directly below the area where the liquid level measurements had historically been taken. It is theorized that the tank wall was weakened during routine measurements of the liquid in the tank, which is accomplished by a stick which was placed into the tank opening at the top. When the tank was partially lifted in the excavation pit and tilted, the weakened area of the wall gave way when the external support provided by the hold-down pad underneath the tank was removed. This theory is supported by the evidence which shows that, since 1982 and up until the day that the tank was tilted in the excavation pit, the level of liquid in the tank had not changed.

SENCO immediately initiated emergency remediation efforts in the interest of minimizing any adverse impact from the xylol spill. These efforts included collection of samples and significant soil excavation during a period of approximately one week. About 300 cubic yards of soil was removed from the pit, aerated for over three weeks, and then returned to the pit pursuant to approval granted by Ohio EPA.

This proposed Remedial Action Plan has been prepared to describe the actions taken by SENCO prior to the date of this report and those which are being proposed for implementation in the immediate future. This plan also includes a discussion of the site and hydrogeologic conditions in and around the site.

SECTION 2

SITE SETTING AND HYDROGEOLOGY

2.1 SETTING

The site is located on Broadwell Road in an industrial area of Anderson Township approximately 3500 feet east/southeast of the Little Miami River. The Little Miami is the nearest down-gradient surface water. The SENCO plant sits in the broad, gently sloping floodplain at an elevation of about 540 ft, MSL. The floodplain rises from an elevation of about 500 feet at the river to about 580 feet within 2000 feet east of the tank pit excavation. The floodplain abuts a steep rise of over 200 feet to a terrace east and south of the site.

The floodplain in the area is essentially used for light manufacturing (i.e., SENCO, Didier-Taylor Refractories, and Heekin Can), for quarrying of sand and gravel (i.e., Dravo), and for sanitary landfilling (i.e., Anderson Landfill, Inc. operated by Rumpke). There are no registered private wells supplying drinking water in the area. Available information indicates that all drinking water in the area is supplied by the City of Cincinnati.

2.2 GEOLOGY

Geologically the site is directly underlain by undifferentiated recent alluvium and Pleistocene fluvial gravel, sand, silt and clay (Robert H. Osborne, 1970. "Bedrock Geology of the Madeira Quadrangle, Hamilton and Clermont Counties, Ohio"). The material is reported to be up to 150 feet thick beneath the Little Miami River. Foundation borings constructed by SENCO in 1972 and 1985 indicate the variable, undifferentiated geology identified by Osborne. Four (4) boring logs to a maximum depth of 24 feet indicate brown, oxidized unconsolidated fluvial deposits with variable sorting and clay content (Appendix B).

The tank pit was excavated to a depth of approximately 14 feet below grade. Unconsolidated fluvial deposits were encountered throughout the depth of excavation. Grain size generally decreased with depth from gravel and cobbles to sand. Discontinuous pockets and stringers of clay and silt were observed in the pit.

The log of production well No. 1 at the Heekin Can facility west of SENCO indicates that the sand and gravel deposits are about 65 feet thick (Appendix B). A layer of blue clay was then encountered above another sand and gravel layer. The upper gravel is Wisconsin age and the lower is Illinoian.

Interbedded shale and limestone of the Ordovician-age Kope Formation are present beneath the glacial material. The Kope Formation, the younger Fairview Formation, and undifferentiated Ordovician limestone (i.e., Bellevue equivalent) outcrop on the terrace above the floodplain east of the site.

2.3 HYDROLOGY AND WATER RESOURCES

In the report "Ground-Water Resources of Hamilton County" (Albert C. Walker, 1986), it is indicated that the tank pit excavation is underlain by material capable of yielding 25 to 100 gallons per minute to wells (Figure 1). Estimated well yields decrease rapidly east of the pit. West of the site yields of up to 100 to 500 gallons per minute may be produced. The exact depth to groundwater is not known. Foundation borings on site have not encountered groundwater to a depth of 31.5 feet (Appendix B). Monitoring wells at the Heekin Can facility are known to exhibit water levels that are 50 to 60 feet below grade. The lower Illinoian sand and gravel is under artesian pressure with water levels to within 15 to 25 feet of land surface. The water table gradient is generally northwest to west away from the site toward the Little Miami River.

The nearest operational private irrigation wells are located over 2 miles southwest of the facility west of Newtown. Furthermore, they are not down-gradient from the tank excavation site. Previously, the Heekin Can facility operated several production wells which are down-gradient from the site; however these wells are now abandoned. The Heekin Can wells were constructed into the lower Illinoian sand and gravel portion of the Little Miami Aquifer over which the facility sits. Water quality is reported to be rather poor as the result of elevated iron and sulfur; however, no analytical reports are available. There are no operational water-supply wells of record downgradient from SENCO.

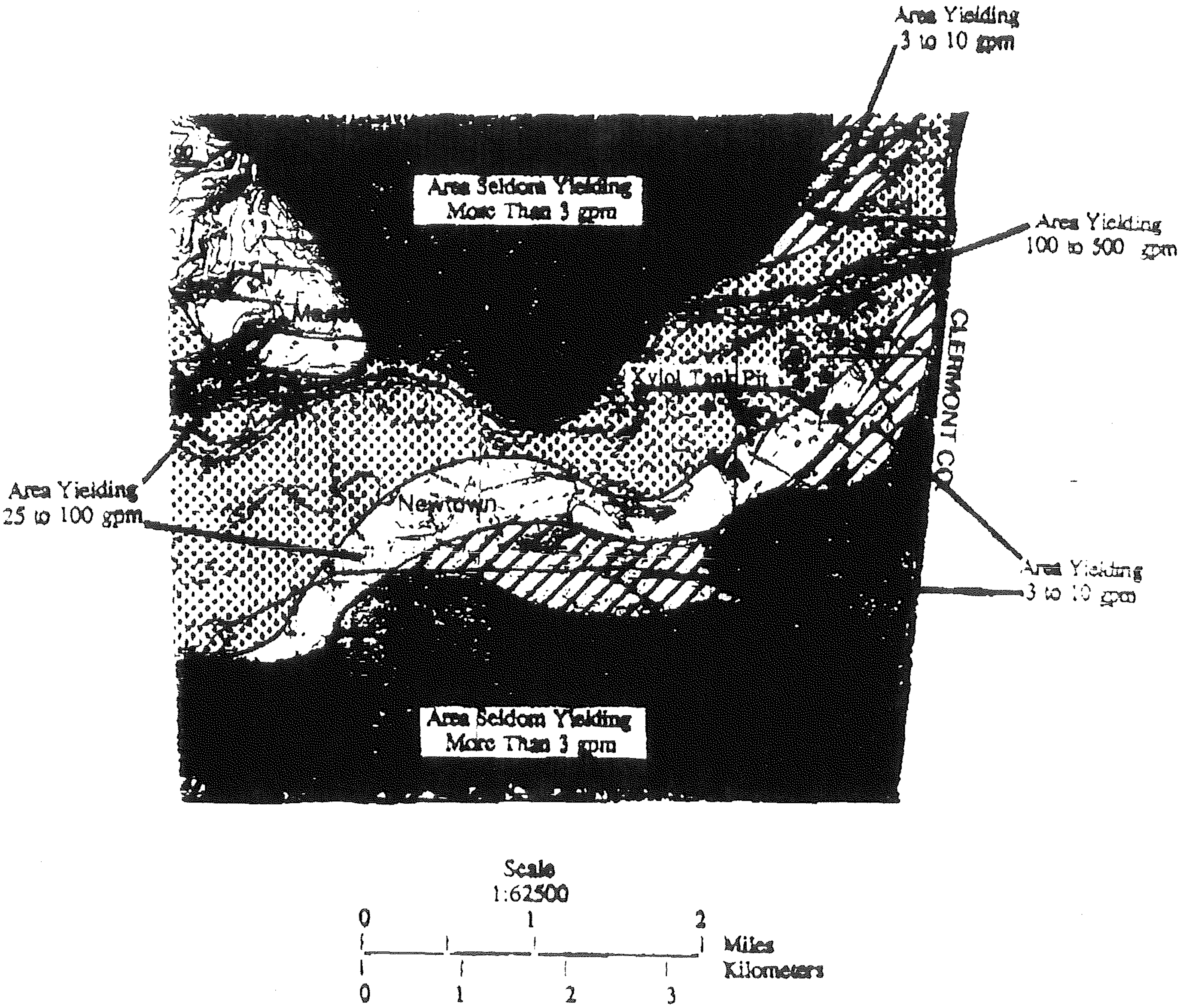


Figure 1. Ground-water resource map.
(Walker, 1986)

SECTION 3

PROBABLE IMPACT OF XYLOL SPILL

Xylol is a commercial grade mixture of xylene isomers and other benzene derivatives. Sampling conducted following the spill indicates that the spilled material was composed exclusively of ethylbenzene and xylenes, with xylenes representing over 60 percent by weight (Appendix A). Chemically, xylenes and ethylbenzene are quite similar; each has a molecular weight of 106, and a density of about 0.86. Xylenes are defined to be essentially insoluble in water and ethylbenzene exhibits very low water solubility. Both biodegrade readily.

An estimated maximum of 300 gallons of the xylol mixture was released to the environment during the spill. Over 100 gallons of the spilled material has already been recovered and drummed for proper disposal. Significant amounts have also dissipated to the atmosphere during aeration of contaminated soils excavated from the pit. Due to the structure and permeability of the material at the bottom of the tank-pit excavation the spilled material will migrate vertically downward due to the force of gravity, with little lateral spreading expected. Because xylol has very low solubility in water, it will migrate as a slug.

The extent of vertical migration is expected to be limited because there is no hydraulic head imposed to drive the xylol downward. Significant attenuation via sorption to clay and silt is expected.

PHYSICAL CONTACT WITH CONTAMINATED SOILS

The contaminated soils returned to the tank pit excavation have been aerated and now contain relatively low levels of xylol (Appendix A). The excavation site will be covered with a vapor barrier material to preclude contact with contaminated soils, once vapor recovery levels decline. Further, the site is surrounded by a 5-6 foot high security fence, with 24 hour surveillance provided by SENCO's security force. Thus, the possibility of physical contact with contaminated soils is remote.

Even if physical contact with contaminated soils were to occur, the levels of xylene and ethylbenzene in the surface soils at the tank excavation pit would not pose a threat to human health. Ingestion of contaminated soils at the site is not a plausible exposure pathway and can be dismissed.

AIR EMISSIONS

Xylol compounds have relatively low boiling points (less than 100°C) and, thus, are volatile. The compounds will transform readily from the liquid phase to the vapor phase. Low level air emissions will occur as long as the contaminated soil is exposed to the atmosphere. However, these emissions will be far below OSHA 8 hour time-weighted average TLVs and will present no threat to human health or the environment. (See 29 C.F.R. 1910.1000, Table Z-1.) Once the vapor barrier system is installed, air emissions from contaminated surface soils will be eliminated entirely.

Emissions from the soil vapor recovery system will be in accordance with the terms and conditions imposed by Permits to Install and Operate issued by Ohio EPA. These emissions will be far below the 40 pounds per day limit on volatile organic compound emissions suggested by the Agency.

SUBSURFACE SOILS

The xylol remaining in the tank pit backfill and underlying earthen materials will not be particularly mobile in the subsurface environment as a result of their affinity to soil materials and their low specific gravity. The remaining xylol will, however, be readily released via soil air and, thus, amenable to soil vapor extraction.

The soil vapor recovery system described in Section 4 of this Plan will remove virtually all remaining xylol from the backfill in the tank pit and underlying soils. Thus, the impact on subsurface soils is expected to be minimal.

In this context, it is important to note that EPA is currently considering proposed action levels for contaminants at RCRA and CERCLA sites. The proposed action level under consideration for xylenes in soil is 34,000 ppm, while the proposed action level being considered for ethylbenzene is 1,700 mg/l. The measured concentrations of xylene and ethylbenzene in the soils at SENCO's tank pit excavation site are far below these action levels (Appendix A).

SURFACE WATER

The nearest surface water down-gradient of the site is the Little Miami River, which is approximately 3500 feet from the tank pit excavation. The Little Miami is not used as a source of drinking water, but rather is utilized for limited recreational purposes. Due to the structure and permeability of the material at the bottom of the tank pit excavation, the spilled material will migrate vertically downward due to the force of gravity, with little lateral spreading expected. Thus, lateral migration toward the Little Miami is not likely.

Even if the spilled xylol were to migrate laterally toward the Little Miami its impact would be minimal, if detectable at all, due to: 1) the relatively small size of the spill, 2) the expected effectiveness of the vapor recovery system in removing xylol from the soil, 3) the great distance to the Little Miami, 4) soil attenuating factors which would retard migration of xylol, 6) the biodegradabiity of xylol in soil, and 7) the diluting and mixing effects of the large volume of water constituting the Little Miami River itself. Thus, no impact on human health or aquatic life inhabiting the River would be expected.

GROUNDWATER

As a threshold matter, it is important to note that there are no groundwater users down-gradient from the tank pit. The nearest residences are up-gradient from the spill and the nearest active water-supply wells are over 2 miles away. These wells, however, are not down-gradient of SENCO. Available records indicate that the Wisconsin water-table aquifer is isolated from the deeper Illinoian water-supply aquifer by a thick layer of clay. The available information indicates that there are no down-gradient users of groundwater from either the water table or deeper aquifer. The xylol spill, therefore, cannot pose a threat to groundwater users.

It is also important to note that the xylol spill is unlikely to reach groundwater at all. The reasons include: 1) the relatively small size of the spill, 2) the depth to groundwater from the excavation pit (boring logs indicate that water was not found down to a depth of at least 31.5 feet below grade (Appendix B)), 3) the expected effectiveness of the vapor recovery system in recovering the spilled xylol, 4) the biodegradability of xylol in soil, 5) significant attenuation due to sorption to clay and silt, and 6) the fact that vertical migration will be limited because there is no hydraulic head to drive the xylol downward.

Even if some xylol were to reach groundwater, its impact would be minimal. First of all, as noted above, there are no down-gradient receptors. Second, the upper Wisconsin aquifer is isolated from the deeper Illinoian water supply aquifer by a thick layer of clay. Third, any xylol reaching groundwater would be vastly diluted by the aquifer itself with resultant concentrations likely to be at or below present detection limits, and thus of little or no environmental consequence.

In this regard, it is most important to note that on November 13, 1985, EPA proposed drinking water RMCLs for xylene and ethylbenzene of 0.44 mg/l and 0.68 mg/l, respectively (50 Fed. Reg. 46981). Personal communications with EPA's Office of Drinking Water indicate that an upwardly revised MCLG of 10 mg/l will be proposed for xylol within the next few months. An MCLG of about 0.70 mg/l will be proposed for ethylbenzene. (By way of comparison, the present MCLs for TCE, carbon tetrachloride, and 1,2-dichloroethane are all 0.005 mg/l (52 Fed. Reg. 25716, July 8, 1987). Thus, it is clear that EPA does not regard either xylene or ethylbenzene as major threats to drinking water supplies, particularly at the very low concentrations which could remotely result from the xylol spill at SENCO.

Further, as noted above, EPA is currently considering action levels for contaminants at RCRA and CERCLA sites. The action levels under consideration for xylenes and ethylbenzene in water are 70 mg/l and 3.5 mg/l, respectively. The chance that the xylol spill at SENCO will result in levels of xylene or ethylbenzene in groundwater at or above these action levels is quite remote.

SECTION 4

REMEDIAL ACTIONS THROUGH FEBRUARY 6, 1989

SENCO initiated remedial actions as soon as the spill was identified on December 16, 1988. Those activities were:

December 16, 1988: Collect and drum approximately 100 gallons of spilled xylol from excavation site and soil. Collect samples of liquid and soils from excavation and analyze (results in Appendix A). Initiate physical removal of contaminated soil.

December 17-23, 1988: Continue removal of hold-down pad, and visibly contaminated soil. Spread contaminated soil on asphalt pad for aeration. Approximately 300 cu. yd. of material removed.

December 20, 1988: Dispose of xylol tank.

December 23, 1988 - January 17, 1989: Periodically turn the 300 cu. yd. of contaminated soil to enhance volatilization. Screen vapors being released using an HNu.

January 17 - February 6, 1989: Return soil removed from the tank pit to the excavation and install vapor recovery system, with approval of Ohio EPA.

Excavation of visibly contaminated material was limited to a maximum depth of approximately 14 feet below grade due to major wall stability problems caused by the high gravel content of the earth materials and due to the proximity to utilities lines. The practical extent of physical removal of contaminated materials has, therefore, been reached.

During the period of December 17 through January 17, the tank pit and removed material were allowed to aerate via natural, low-level releases to the atmosphere. This procedure allowed significant, but unquantified, reduction of xylol concentrations in the soils below the excavation and in the soil materials returned to the excavation.

SECTION 5

FUTURE REMEDIAL ACTIONS

5.1 ACTIVE VAPOR RECOVERY SYSTEM

5.1(a) SYSTEM DESIGN

SENCO installed an active vapor recovery system on January 17, 1989 to remediate the xylol still present in materials removed from the tank pit excavation and in the soil immediately below the excavation. Vapor recovery is a proven technology for volatile organic compounds such as xylol. The procedure allows on-site treatment thus minimizing the potential problems posed by transporting for ultimate disposal in a landfill. Figure 2 presents a schematic diagram of the installed vapor recovery system.

A horizontal collector pipe of 4-inch, slotted PVC was installed in the excavation to a depth of 13 feet below grade. The pipe was surrounded by a clean, fine sand backfill and the material previously removed from the tank pit was returned to the excavation. A 4-inch, solid PVC riser pipe was extended through the backfill to the surface. The hole will be completed to grade with clean gravel.

A five-horsepower vacuum pump was installed to operate at about 25-feet of hydraulic head (i.e., 6-inches of mercury). Through a thisttling mechanism, the flow rate can be adjustable from 25 cfm (cubic feet per minute) to 200 cfm. When operated, vapors will be generated as soil air outside the tank pit is drawn to the collector. The resulting vapor and air will be directly discharged to the atmosphere, pursuant to a Permits to Install and Operate which will be obtained from Ohio EPA.

Air flow pathways will be controlled by selective placement of a synthetic vapor barrier over the excavation. The pit will initially remain open to the atmosphere to allow maximum air flow through the backfill. Vapor barrier material will be added as vapor recovery levels decline to force air flow through other potentially effected soil.

Headspace HNu readings of soil in the tank pit indicate vapor concentrations from less than 1 ppm to about 600 ppm (Appendix A). One ppm of xylol is equivalent to 4.3 mg/m^3 of air. If the vapor recovery system is operated at an average of 100 cfm at an average 200 ppm vapor concentration, the vapor recovery system will remove about 7.5 pounds of xylol per day.

The recovered vapor will be atmospherically discharged. The discharge rate of 7.5 pounds per day is well below the 40 pounds per day VOC emissions limit suggested by the Ohio EPA. If possible, air flow rates will be increased to speed vapor removal. At no time, however, will a 40 pound per day emission rate be exceeded.

5.1(b) MONITORING

Discharge from the vapor recovery system will be monitored daily for temperature, flow rate, and vapor VOC concentration. Concentration will be determined using a portable organic vapor analyzer (i.e., HNu or equivalent and OVA). The measured concentration will be plotted on a time/concentration or time/cumulative poundage graph. During the first month of operation, vapor samples will be collected weekly for chemical analysis of xylenes and ethylbenzene. Thereafter samples will be collected monthly for analysis. For several days to a few weeks, it will be necessary to adjust and stabilize the system periodically to achieve maximum efficiency. After the system has been adjusted, SENCO will recommend a system performance standard.

Monitoring results will be reported to Ohio EPA on a quarterly basis. Included will be the graph of daily volatile emissions and laboratory reports of measured levels of xylene and ethylbenzene.

5.2 IN-SITU BIORECLAMATION

During active vapor extraction, in-situ bioreclamation of xylol will occur. Naturally occurring soil bacteria will use the xylol as a food source in the presence of the increased oxygen available to chemically degrade the xylol. Both xylenes and ethylbenzene have been shown to be easily biodegraded. (See e.g., 40 C.F.R. Part 300, Appendix A, Table 5 and EPA Treatability Manual 600-8-80-042A, Volume 1, September 1981.) As a combined action, bioreclamation and vapor recovery through phase changes will effect successful remediation of the xylol spill.

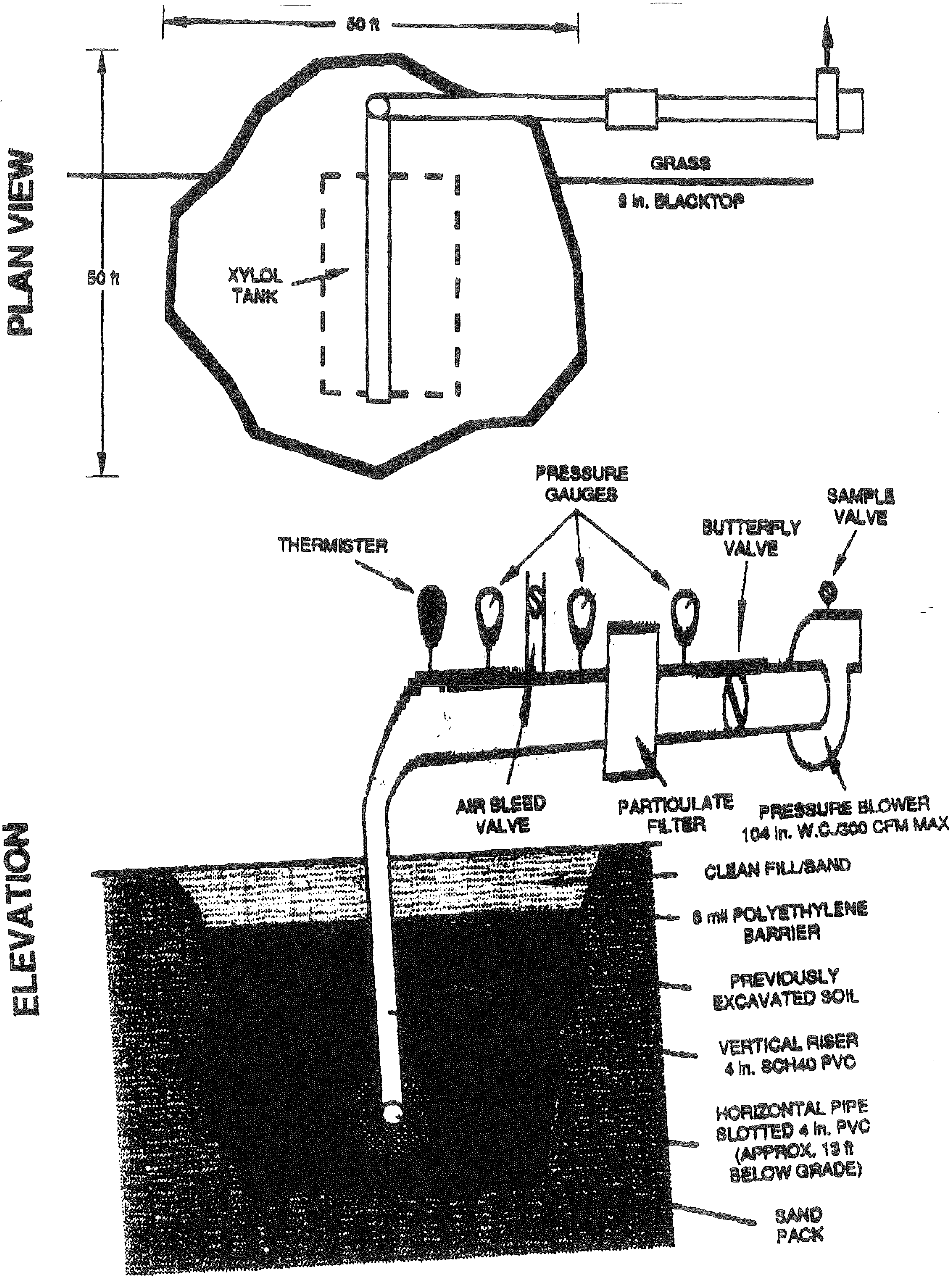


Figure 2 Schematic diagram of vapor recovery system

SECTION 6

FINAL REPORT

Once the remediation efforts proposed in this plan are completed, a final report will be prepared and submitted to Ohio EPA.

SECTION 7

CONCLUSIONS

Following the spill of approximately 300 gallons of xylol, SENCO undertook actions that significantly reduced the amount of material present in soil. One hundred gallons of xylol were immediately physically removed from the environment and a month-long aeration program allowed atmospheric release of several more gallons of xylol from contaminated soils. Measured xylene and ethylbenzene concentrations in the soil at SENCO are well below the action levels under consideration by EPA for RCRA and CERCLA sites.

The xylol remaining in the tank pit backfill and underlying earthen materials will not be particularly mobile in the subsurface environment as a result of their affinity to soil materials and their low specific gravity. The remaining xylol will, however, be readily released via phase change to soil air and, thus, amenable to soil vapor extraction. The soil vapor recovery system installed by SENCO is expected to remove virtually all remaining xylol from the backfill and soils underlying the tank pit excavation. Thus, soils at the site will be fully remediated.

In the intervening time, physical contact with contaminated soils is regarded as remote. Atmospheric emissions of xylol during the course of remediation also will be minimal, having no adverse effect on human health or the environment.

Regarding potential surface water impacts, the nearest down-gradient surface water is 3500 feet from the site and is not used as a source of drinking water. The likelihood of a discernible impact on the Little Miami River is remote, if not non-existent.

The possibility of adversely impacting groundwater is also remote. First of all, the xylol spilled at the site is unlikely to reach groundwater at all. However, even in the unlikely event that some xylol were to reach groundwater underlying the site, the action levels being considered by EPA for xylene and ethylbenzene strongly suggest that the xylol spill at SENCO will have no adverse effect on groundwater and, thus, no adverse effect on human health or the environment.

Further, even if some xylol were to reach groundwater, there are no groundwater users down-gradient of the site and, therefore, no drinking water receptors to impact. Finally, even if down-gradient drinking water receptors were available, the proposed RMCLs and MCLGs for xylene and ethylbenzene strongly indicate that the xylol spill at SENCO poses no threat to human health via a drinking water pathway.

In conclusion, implementation of this Remedial Action Plan will remediate virtually all potential contamination at the site and prevent any adverse effect on human health or the environment. However, in the unlikely event that some further remediation is indicated, an addendum to this plan addressing this presently unforeseen circumstance will be prepared.

APPENDIX A

LABORATORY RESULTS OF
LIQUID AND SOIL SAMPLING
DECEMBER 16, 1988

PEI Analytical Services

11499 Chester Rd.
Cincinnati, Ohio 45246
(513) 782-4700

Client:	Sencorp 8485 Broadwell Cincinnati, Ohio 45244	Project No.:	8775
		Requisition No.:	T8-12-156
		Date Received:	12/16/88
		Sampled by:	
		Date Reported:	12/20/88
Attn:	Anthony Muto, Esq.		

Sample ID	PEI No.	Flash Point, C
Sample #1 Soil beneath Xylol Tank	01	> 95 C
Sample #2 Liquid from Xylol Tank	02	30 C

Submitted by:

Ken Mueller

Ken Mueller
Associate Group Supervisor
Inorganic Lab

PEI Analytical Services

CLIENT: Sencorp
8485 Broadwell
Cincinnati, Ohio 45244

ATTN: Mr. Anthony Muto, Esq.

PROJECT: 8775
REQ: T9-12-156
RECEIVED: 12/16/88
FILE: C214

DATE REPORTED: 12/20/88

MATRIX: Soil

Analyte Concentration

Sample ID	PEI No.	Ethyl benzene	Total xylenes	Units
SOIL BENEATH XYLOL TANK SAMPLE #1 12/19/88	-01	72	320	Ug/G (PPM)
DRUMMED WASTE 12/15/88 NON-AQUEOUS PORTION ONLY SAMPLE #4	-02	170	600	Grams/Liter
METHOD BLANK		ND	ND	

Detection Limit Sample #1, <0.13 Ug/G
Sample #2, <0.05 Grams/Liter

Approved By:

H. William Jess
Organic Laboratory
Supervisor

W. Thompson

PEI Analytical Services

December 20, 1988

Anthony Muto
Sencorp
8485 Broadwell
Cincinnati, Ohio 45244

RE: Work Order T8-12-156

Dear Mr. Muto

The following is a summary of the results of the analysis of 1 soil for a fingerprint against a supplied liquid. The sample was received by our laboratory on December 16, 1988. Dichloromethane was used to extract the sample and dilute the supplied liquid to an appropriate level. There were two phases to the supplied liquid. As requested, only the top portion was used for the comparison.

As can be seen with the supplied comparison plot, the organic material extracted from the soil sample is identical to the supplied liquid.

If you have any further questions regarding the data, please feel free to call.

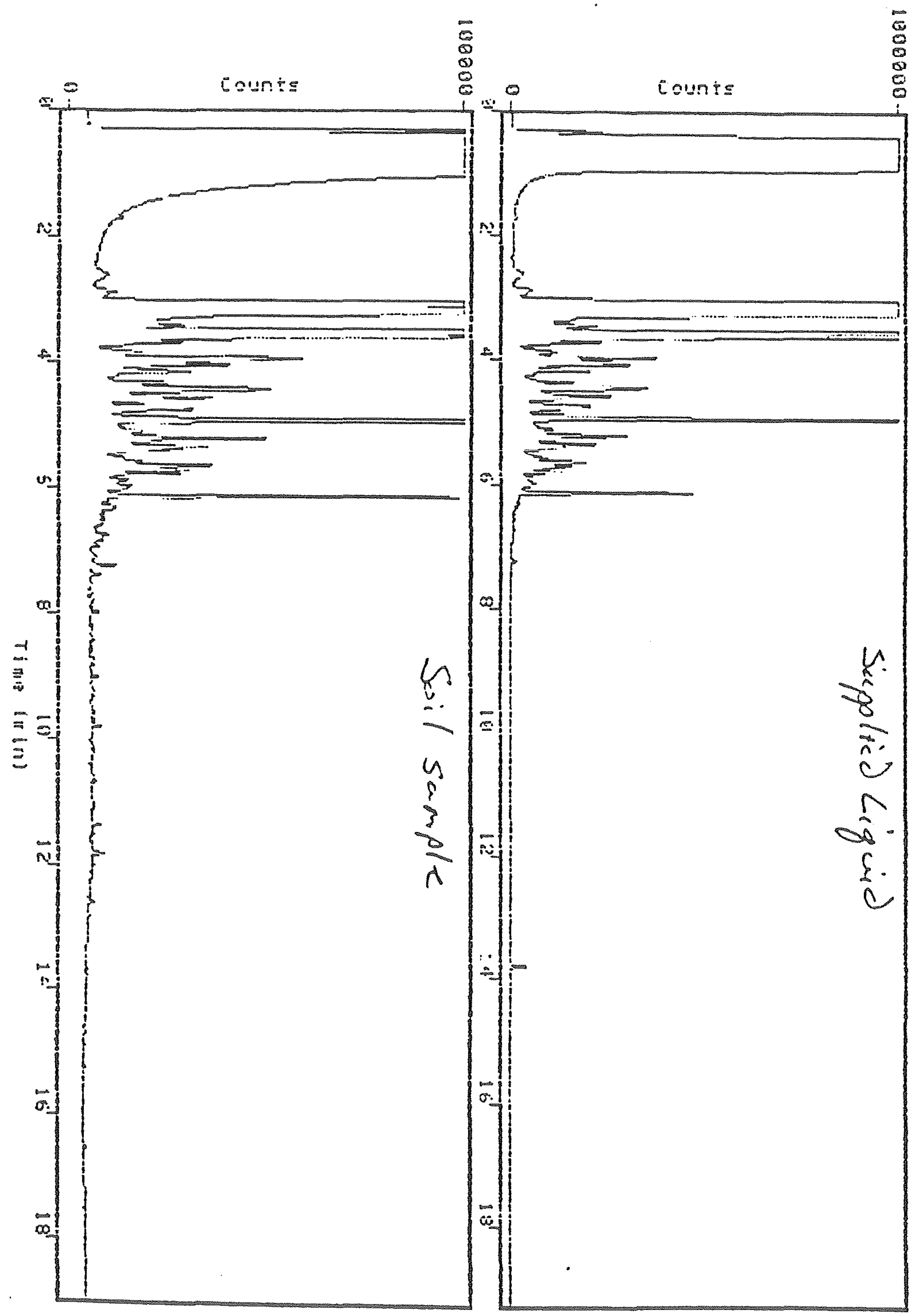
Sincerely:

Craig Crume

Craig Crume
GC Lab Group Leader
PEI Associates, Inc.
11499 Chester Rd.
Cincinnati Ohio 45246
513-782-4700

Date: Sat Dec 17, 1988 2:36:20 pm

Filename	Start Time	End Time	Minimum Counts	Maximum Counts	Line Type
GCJUNK002	0.00	19.32	0	1000000	1
GCJUNK003	0.00	19.05	0	1000000	[illegible]



APPENDIX B

BORING LOGS

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 1921
4120 AIRPORT ROAD • P.O. BOX C • CINCINNATI, OHIO 45226 • 513-321-5816
912 MORRIS STREET • CHARLESTON, WEST VIRGINIA 25301 • 304-344-0821
BOX NUMBER 11 • HIGHLAND HEIGHTS, KENTUCKY 41076 • 606-581-6043

7-11-85 vf
P.O.#V91702A

TEST BORING REPORT

CLIENT Sencorp ORDER No. 5263.019

PROJECT Sencorp, Plant 2, Waste Treatment Plant, Broadwell Road, Hamilton County, Ohio HOLE No. B-3

LOCATION As staked

DRILLER H. Grubb DRILL No. 31 DATE STARTED 7-1-85

ELEVATION REFERENCE DATE COMPLETED 7-1-85

CASING: DIAMETER 3.25" I. D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE None UPON COMPLETION None

DEPTH TO WATER DAYS AFTER COMPLETION WATER USED IN DRILLING No

ELEVATION	DEPTH 0'		DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recovery
		5.0'	Brown CLAYEY SAND with GRAVEL (ROCK FRAGMENTS), moist - medium dense to dense	1 2	0-1.5 2.5-4	SS SS	8-11-14 12-15-17	16" 18"
	5.0'	5.0'	Brown SILTY SAND with GRAVEL (ROCK FRAGMENTS), moist - dense to very dense	3 4	5-6.5 7.5-9	SS SS	14-17-23 17-23-36	16" 17"
	10.0'	2.5'	Brown SILTY SAND with GRAVEL (ROCK FRAGMENTS), moist - dense	5	10-11.5	SS	12-16-21	18"
	12.5'	7.5'	Brown WELL-GRADED SAND WITH SILT AND GRAVEL, moist - medium dense	6 7 8	12.5-14 15-16.5 17.5-19	SS SS SS	6-7-9 9-11-14 10-13-16	16" 16" 18"
	20.0'	1.5'	Brown POORLY-GRADED SAND (FINE TO MEDIUM) WITH SILT AND GRAVEL, moist - medium dense	9	20-21.5	SS	9-9-11	16"
	21.5'							

BORING COMPLETED

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials penetrated in the boring.

Respectfully submitted,
THE H. C. NUTTING CO.
By [signature]

THE H. C. NUTTING COMPANY
GEOTECHNICAL AND TESTING ENGINEERS SINCE 1921
4120 AIRPORT ROAD • P.O. BOX C • CINCINNATI, OHIO 45226 • 513-321-5816
912 MORRIS STREET • CHARLESTON, WEST VIRGINIA 25301 • 304-344-0821
BOX NUMBER 11 • HIGHLAND HEIGHTS, KENTUCKY 41076 • 606-261-8043

7-11-85 vf
P.O.#V91702A

TEST BORING REPORT

CLIENT Sencorp ORDER No. 5263.019

PROJECT Sencorp, Plant 2, Waste Treatment Plant, Broadwell Road, Hamilton County, Ohio HOLE No. B-4

LOCATION As staked

DRILLER H. Grubb DRILL No. 31 DATE STARTED 7-1-85

ELEVATION REFERENCE DATE COMPLETED 7-1-85

CASING: DIAMETER 3.25" I. D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2" O. D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE None UPON COMPLETION None

DEPTH TO WATER DAYS AFTER COMPLETION WATER USED IN DRILLING No

ELEVATION	DEPTH 0'	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recovery
		2.5' Brown SANDY LEAN CLAY with gravel, moist - medium stiff to stiff	1	0-1.5	SS	3-4-6	16"
	2.5'		2	2.5-4	SS	6-11-13	18"
		5.0' Brown CLAYEY SAND with GRAVEL (ROCK FRAGMENTS), moist - medium dense	3	5-6.5	SS	10-11-12	18"
	7.5'		4	7.5-9	SS	9-13-16	16"
		9.0' Brown SILTY SAND with GRAVEL (ROCK FRAGMENTS), moist - medium dense	5	10-11.5	SS	6-7-8	16"
			6	12.5-14	SS	8-9-11	17"
			7	15-16.5	SS	7-9-13	16"
	16.5'						
		BORING COMPLETED					

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials penetrated in the boring.

Respectfully submitted,
THE H. C. NUTTING CO.
By Nyle L. Holten

REC. SEP 15 1988

THE H. C. NUTTING COMPANY

TESTING ENGINEERS AND SOIL CONSULTANTS • SINCE 1921
4120 AIRPORT ROAD • CINCINNATI, OHIO 45226 • TEL. 513-321-5816

June 28, 1972 nn

TEST BORING REPORT

CLIENT Kral, Zepf and Freitag ORDER No. 4062.46

PROJECT Proposed Expansion - Senco Products, Inc. Newtown, Ohio HOLE No. 1

LOCATION As shown on plan

DRILLER W. Moore DRILL No. 25 DATE STARTED 6-22-72

ELEVATION REFERENCE DATE COMPLETED 6-22-72

CASING: DIAMETER 3.25" I.D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2" O.D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE 24.5' UPON COMPLETION 20.0'

DEPTH TO WATER DAYS AFTER COMPLETION Backfilled WATER USED IN DRILLING None

ELEVATION	DEPTH 0'	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recovery
			1	0-1.5	SS	4-6-16	10"
		2.5' Dark brown sandy silty clay and gravel, (fill), moist - very stiff					
	2.5'		2	2.5-4	SS	7-9-10	16"
		1.5' Brown and gray silty clay, moist - very stiff					
	4.0'		3	5-6.5	SS	8-6-7	15"
		6.0' Brown clay, moist - very stiff	4	7.5-9	SS	6-8-10	16"
	10.0'		5	10-11.5	SS	4-7-6	16"
			6	12.5-14	SS	3-5-6	16"
		5.0' Brown sandy clay with some fine gravel, moist - stiff					
	15.0'		7	15-16.5	SS	5-5-4	10"
			8	17.5-19	SS	3-7-8	10"
		9.5' Brown clayey fine to coarse sand and gravel, moist - stiff to very stiff	9	20-21.5	SS	9-10-9	12'

REMARKS: 24.5'

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials penetrated in the boring.

Respectfully submitted,
THE H. C. NUTTING CO.

By Merle F. [illegible]

Form 884A—10-88

PROJECT Proposed Expansion - Senco Products, Inc., Newtown, Ohio HOLE No. 1

ELEVATION	DEPTH 24.5'	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER	Rec
			10	25-26.5	SS	5-6-5	18"
		7.0' Brown fine to medium sand with some fine gravel, loose to medium dense	11	30-31.5	SS	4-6-8	10"
	31.5'						
		BORING COMPLETED					

THE H. C. NUTTING COMPANY

TESTING ENGINEERS AND SOIL CONSULTANTS • SINCE 1921

4120 AIRPORT ROAD • CINCINNATI, OHIO 45226 • TEL. 513-321-5816

"AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC, AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS, AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS, OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL."

June 28, 1972 nn

TEST BORING REPORT

CLIENT Kral, Zepf and Freitag ORDER No. 4062.46

PROJECT Proposed Expansion - Senco Products, Inc., Newtown, Ohio HOLE No. 3

LOCATION As shown on plan

DRILLER W. Moore DRILL No. 25 DATE STARTED 6-22-72

ELEVATION REFERENCE DATE COMPLETED 6-22-72

CASING: DIAMETER 3.25" I.D. Hollow Stem Auger HAMMER WT. FALL

SAMPLER: DIAMETER & TYPE 2" O.D. Split Spoon HAMMER WT. 140# FALL 30"

DEPTH TO WATER: IMMEDIATE Wet at 10.0'; Water at 24.0' UPON COMPLETION Caved at 23.0', dry

DEPTH TO WATER DAYS AFTER COMPLETION Backfilled WATER USED IN DRILLING No

ELEVATION	DEPTH 0'		DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recovery
		3.0'	Dark brown silty clay (fill), moist - stiff	1	0-1.5	SS	4-6-8	16"
	3.0'	4.5'	Dark brown sandy clay with fine gravel, moist - stiff	2 3 4	1.5-3 3-4.5 5-6.5	SS SS SS	7-8-7 4-5-4 4-5-5	16" 16" 10"
	7.5'	2.5'	Brown silty clay with fine gravel, moist - stiff	5	7.5-9	SS	3-4-5	10"
	10.0'	2.5'	Brown clayey fine to coarse sand and gravel with rock fragments, moist - stiff	6	10-11.5	SS	4-6-6	10"
	12.5'	2.5'	Brown silty fine to coarse sand with some fine gravel, moist - loose	7	12.5-14	SS	3-3-4	12"
	15.0'	10.0'	Brown silty fine to coarse sand and gravel with rock fragments, moist - medium dense to dense	8 9 10	15-16.5 17.5-19 20-21.5	SS SS SS	10-9-9 7-8-14 12-20-15	15" 10" 16"
	25.0'			11	25-26.5	SS	4-7-10	18"

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating or other physical characteristics of materials penetrated in the boring.

Respectfully submitted,

THE H. C. NUTTING CO.

By Merle F. Nutting

Form 504A—10-64

PROJECT Proposed Expansion - Senco Products, Inc., Newtown Ohio HOLE No. 3

ELEVATION	DEPTH	DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER [illegible]	
	25.0'						
		6.5' Brown fine to coarse sand, wet - medium dense	12	30-31.5	SS	5-6-11	18"
	31.5'						
		Boring completed					

THE H. C. NUTTING COMPANY
TESTING ENGINEERS AND SOIL CONSULTANTS • SINCE 1921
4120 AIRPORT ROAD • CINCINNATI, OHIO 45226 • TEL. 513-321-5816

TEST BORING REPORT

August 8, 1972 nn

CLIENT Kral, Zapf, Freitag and Associates ORDER No. 4062.46

PROJECT Proposed Expansion - Senco Products, Newtown, Ohio HOLE No. 6

LOCATION North 3438; East 2822

DRILLER B. R. Ball DRILL No. 17 DATE STARTED 7-28-72

ELEVATION REFERENCE Kral, Zapf, Freitag and Associates DATE COMPLETED 7-28-72
CASING: DIAMETER 2.25" I.D. Hollow Stem Auger HAMMER WT. FALL
SAMPLER: DIAMETER & TYPE 2" O.D. Split Spoon HAMMER WT. 140# FALL 30"
DEPTH TO WATER: IMMEDIATE None UPON COMPLETION None
DEPTH TO WATER 3 DAYS AFTER COMPLETION None WATER USED IN DRILLING No

ELEVATION 532.0'	DEPTH 0'		DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLER or % Core Rec.	Recovery
		0.5'	Dark brown silty loam, slightly moist - medium stiff	1	0-0.5	SS	3	4"
531.5'	0.5'			2	0.5-1.5	SS	4-5	10"
		4.5'	Brown silty clay, moist - stiff	3	2.5-4	SS	5-6-8	14"
527.0'	5.0'			4	5-6.5	SS	5-6-7	18"
		2.5'	Brown sandy silty clay, moist - stiff					
524.5'	7.5'			5	7.5-9	SS	4-5-5	11"
		2.5'	Dark brown silty clay with fine gravel and some silt pockets, moist - stiff					
522.0'	10.0'			6	10-11.5	SS	4-6-7	10"
		1.5'	Gray and brown silty fine to coarse sand and gravel, moist - medium dense					
520.5'	11.5'							

REMARKS:

BORING COMPLETED

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating, or other physical characteristics of materials penetrated in the boring.

Respectfully submitted,
THE H. C. NUTTING CO.
By M. F. Nutting

THE H. C. NUTTING COMPANY
TESTING ENGINEERS AND SOIL CONSULTANTS • SINCE 1921
4120 AIRPORT ROAD • CINCINNATI, OHIO 45226 • TEL. 513-321-5816

August 8, 1972 nn

TEST BORING REPORT

CLIENT Kral, Zepf, Freitag and Associates ORDER No. 4062.46

PROJECT Proposed Expansion - Senco Products, Newtown, Ohio HOLE No. 7

LOCATION North 3604; East 2568

DRILLER B. R. Ball DRILL No. 17 DATE STARTED 7-28-72

ELEVATION REFERENCE Kral, Zepf, Freitag and Associates DATE COMPLETED 7-28-72
CASING: DIAMETER 2.25" I.D. Hollow Stem Auger HAMMER WT. FALL
SAMPLER: DIAMETER & TYPE 2" O.D. Split Spoon HAMMER WT. 140# FALL 30"
DEPTH TO WATER: IMMEDIATE None UPON COMPLETION None
DEPTH TO WATER 3 DAYS AFTER COMPLETION None WATER USED IN DRILLING No

ELEVATION 534.0'	DEPTH 0'		DESCRIPTION OF MATERIALS	SAMPLE No.	SAMPLE DEPTH	TYPE OF SAMPLE	BLOWS PER 6" ON SAMPLES or % Core Rec.	Recovery
		2.0'	Crushed stone with some blacktop, (drive)	1	0-2.0	Auger		
532.0'	2.0'			2	2-3.5	SS	4-5-7	18"
		3.0'	Dark gray and brown silty clay, moist - stiff					
529.0'	5.0'			3	5-6.5	SS	7-8-9	18"
		2.5'	Brown silty clay, moist - very stiff					
526.5'	7.5'			4	7.5-9	SS	6-5-5	11"
		4.0'	Brown silty clay with some fine gravel and some silt pockets, moist - stiff	5	10-11.5	SS	4-4-5	8"
522.5'	11.5'							
			BORING COMPLETED					

REMARKS:

Samples recovered from this test boring are available for inspection, which is strongly recommended. The company assumes no responsibility for interpretations made by others of load bearing, stability, excavating, or other physical characteristics of materials penetrated in the boring.

Respectfully submitted,
THE H. C. NUTTING CO.
By M. F. Nutting

WELL #3 (PRODUCTION WELL #1 - BALDWIN)

BALDWIN PIANO COMPANY
ANCOR, OHIO

Date started: June 26, 1951

Diameter 8".

0'	- 12'	— 12'	Dry Gravel and Boulders
12'	- 41'	— 29'	Muddy Dry Gravel
41'	- 66'	— 25'	Sand and Gravel
66'	- 71'	— 5'	Blue Clay
71'	- 96'	— 25'	Blue Sandy Loam
96'	- 102'	— 6'	Coarse Sand and Gravel
102'	- 103'	— 1'	Shale

Installed 5 feet of 8" A. D. Cook Tubular Red Brass Strainer and fittings, cut slot No. 60. Static Water Level 50 feet.

Installed test pump in well, pumped 10 gallons of water per minute and pump broke suction.

Pulled test pump, 8" strainer and 8" pipe to make well at 66 ft. level. Installed 10 feet of 8" Cook Tubular Red Brass Strainer with standard fittings, cut slot No. 30, and water level of 48 feet.

Installed test pump and well pumped full capacity of pump, 55 gallons of water per minute with 2 1/2 foot draw down. We then pulled this pump and installed a larger pump, start of test showed 122 gallons of water per minute and well was surging itself. The next day was spent in pumping well and washing back, bringing capacity to a steady 144 gallons per minute.

Turbine installed in well No. 14193 - Curve 7-5/8TR-15

One 7-5/8" 8-stage Cook Deep Well Turbine
50 feet of 4" FPG column, 1-1/2" shaft tube and 1" line shaft.
10 feet of 4" suction tube
One No. 165 EZ-4 Cook Discharge head equipped with 10 HP, 1760 RPM, 3 phase, 60 cycles 220/440 volts, with 4" x 4" base.

OHIO ENVIRONMENTAL PROTECTION AGENCY

TELEPHONE MEMORANDUM

WITH Tony Moto DATE 5/18/89

REPRESENTING SENCO TIME 13:00

PERMIT NO. PHONE 388-2914

OEPA STAFF Bendula

SUBJECT Update on UST

NOTES & SUMMARY: FOLLOW-UP DATE

Intentions to install monitoring well(s)

He has installed a monitor well at ≈ 40'

Soil samples at 15, 25 and 30' - Xylol in ppm 1-2 range. He wants to use wells at the Anderson Twp. as downgradient monitor wells for SENCO. He installed a Stainless Steel well ≈50' downgradient from the tank cavity.

Vapor system recovering 40 ppm since mid March.

EPA 2401

Signature Bendula

KZF INCORPORATED

RECEIVED
MAY 18 1978
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

5/22/78

May 17, 1978

O.E.P.A.
7 East Fourth Street
Dayton, Ohio 45402

Attn: Mr. James Pennino

Re: Senco Nail Cleaning Waste
Newtown, Ohio
KZF Comm. No. 1018 VB

Dear Sir:

Your letter to Mr. George Juilfs, President of Senco Products, Inc. dated June 24, 1977, made recommendations that the occasional surface discharge from the lagoons should be dammed and the use of the lagoons as a method of wastewater disposal is not acceptable because of the potential ground water contamination. On July 19, 1977, Mr. N. D. Day, General Manager for Senco wrote a letter to your office stating they would dam the lagoons to prevent surface discharge and begin investigating alternatives to their wastewater problems.

On May 16, 1978, I visited the lagoons at Senco. They have four lagoons of which they presently use only three. The lagoons have been diked so that under normal conditions they do not overflow. The lagoons are set up on a rotating nine week cycle. All the waste for a three week period is discharged into the first lagoon, the next three week's waste is dumped into the second lagoon, while the last lagoon receives the next three week's waste and then the cycle is repeated.

It is our understanding, per our telephone conversation on May 15, 1978, that if the lagoons were dammed so that no surface runoff was possible, the use of the lagoons to dispose of Senco's industrial waste would be permitted. This would require the construction of new lagoons periodically as the capacity of the existing lagoons was reached.

This is not consistent with your letter of June 24, 1977, please review O.E.P.A.'s position on this matter and advise. This clarification is necessary before we can complete our feasibility study.

We would appreciate your earliest reply as Senco is very anxious to finish this phase of this project.

Thank you in advance for your cooperation.

Very truly yours,

KZF, INCORPORATED

Michael M. Powell

Michael M. Powell, P.E.

MMP/as

cc Tom Haskell
Roy Staub
Nick Tsimaras
Gary Bates

senco fastening systems

April 24, 1978

Mr. James Pennino
State of Ohio
Environmental Protection Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

Dear Mr. Pennino:

Attached please find two reports from KZF concerning the additional sampling which I described in my March 23, 1978 letter. Further reports will be sent to your office as they are received.

Sincerely,

Peter A. Eberle

Peter A. Eberle, C.S.P.
Corporate Risk Manager

RECEIVED
APR 26 1978
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

PAE:jkw
Attachment

cc: N. Day (W/O enclosures)
R. Staub
T. Haskell
E. Rehme, OEPA
M. Powell, KZF

KZF

ENVIRONMENTAL DESIGN CONSULTANTS INC
ARCHITECTS • ENGINEERS • PLANNERS • SURVEYORS
2830 Victory Parkway, Cincinnati, Ohio. 45206 (513)281-7723

March 31, 1978

Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

RECEIVED
APR 26 1978
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

Attn: Mr. Tom Haskell

Re: Nail Cleaning Liquid Waste
KZF Comm. No. 1018 VB

Dear Sir:

On January 18, 1978, we received a letter from M.S.D. which stated they would not accept the nail cleaning waste from Senco at their Little Miami Wastewater Treatment Plant without some pretreatment to reduce the oil and grease concentrations and the excessive heavy metal concentrations, namely the zinc.

The test data submitted to KZF shows a range for the oil and grease between 600 mg/l to 28,500 mg/l or almost a 50 to 1 ratio. This same test data shows a range of 5.4 mg/l to 615 mg/l for the zinc concentration, a ratio of 114 to 1. The zinc can be found in three separate fractions, as part of the floatable material, as part of the main stream waste (liquid), or as part of the sludge.

The concentration of zinc in each fraction is vital in determining what pretreatment methods will be successful. The zinc concentration must be reduced to an average of 6 mg/l with a maximum of 30 mg/l to be acceptable to M.S.D. If a significant portion of the reported zinc concentrations (5.4 mg/l to 615 mg/l) is within the floatable fraction and or in the sludge fraction the degree of pretreatment of the liquid wastes will be substantially reduced.

We have scheduled the following activities as the next steps to be completed.

1. Mike Powell (KZF) will take grab samples of the floatable fraction, the liquid fraction and the sludge fraction from all three cleaning machines while they are in the production mode as well as from the holding tank. Scheduled for April 3, 1978.

2. Mike Powell (KZF) will install an automatic sampler to gain a composite sample from each cleaner as well as the holding tank. This will take approximately one week and should be installed by April 7, 1978.

These additional sample collections and testing are being conducted to allow us to establish and identify each sample. The proper sample procedures, techniques, and identification is paramount to the success of reliable test data and is an invaluable aid in analyzing this data.

With the schedule we have established, the final report should be available by July, 1978 as we indicated in our correspondence dated March 17, 1978.

Our purchase order for $4,500 will be exceeded due to some unexpected developments on this project, but we will only bill Senco to the limits of this purchase order.

Very truly yours,

KZF, INCORPORATED

Michael M. Powell

Michael M. Powell, P.E.

MMP/as

cc Roy Staub - Senco
Nick Tsimaras - KZF
Gary Bates - KZF

KZF
ENVIRONMENTAL DESIGN CONSULTANTS INC
ARCHITECTS • ENGINEERS • PLANNERS • SURVEYORS
2830 Victory Parkway, Cincinnati, Ohio. 45206 (513)281-7723

April 14, 1978

Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

Attn: Mr. Tom Haskell

Re: Nail Cleaning Liquid Waste
KZF Comm. No. 1018-VB

Dear Sir:

The following activities have been accomplished within the last two weeks:

1. KZF took grab samples on April 3, 1978 of the floatable fraction, the liquid fraction, and the sludge fraction from the Ransohoff Unit No. 2, and the Nail Cleaning Unit No. 3 while they were in the production mode.

2. KZF took grab samples on April 3, 1978 of the floatable fraction, the liquid fraction and the sludge fraction from the Ransohoff Unit No. 1 while it was in the purge mode.

3. KZF took grab samples on April 3, 1978 of the floatable fraction, the liquid fraction and the sludge fraction from the holding tank.

4. All grab samples taken on April 3, 1978 were delivered to Dr. Riley Kinman on April 3, 1978 for his analysis.

5. On April 7, 1978 the automatic sampler was installed at Senco on the Ransohoff Unit No. 1.

6. On April 10, 1978 the automatic sampler was installed on the Ransohoff Unit No. 2.

7. On April 12, 1978 the automatic sampler was installed on the holding tank.

8. On April 13, 1978 the automatic sampler was installed on the Nail Cleaning Unit No. 3.

9. On April 14, 1978 the sampler was removed from Senco.

10. On April 14, 1978 these composite samples were delivered to Dr. Riley Kinman for his analysis.

Very truly yours,

KZF, INCORPORATED

Michael M. Powell

Michael M. Powell, P.E.

MMP/as

cc Roy Staub - Senco
Nick Tsimaras - KZF
Gary Bates - KZF

senco fastening systems

P

March 23, 1978

Mr. James D. Pennino
State of Ohio
Environmental Protection Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

RECEIVED
MAR 29 1978
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

Dear Mr. Pennino:

In my last Progress Report of January 3, 1978, I reported that W. E. Gates & Associates had completed the analysis of the liquid wastes from our nail cleaning operation. These analytical results were forwarded to our consultants, KZF, for their review and evaluation.

Since January, KZF has been in contact with several waste disposal firms to determine if our wastes could be economically hauled away. Enclosed are Progress Reports of January 20, 1978 and February 15, 1978 from KZF, outlining the firms they contacted. After review, KZF has concluded that off site disposal without pretreatment may not be desirable. In their enclosed letter of March 17, 1978, they have advised that they will begin laboratory studies to investigate pretreatment alternatives. They advise that this investigation will require approximately three months to complete.

I will send you a Progress Report on August 1, 1978, outlining what has taken place since this current report. If you have any questions, please don't hesitate to contact me.

Sincerely,

P. A. Eberle

Peter A. Eberle, C.S.P.
Corporate Risk Manager

PAE:jkw
cc: N. Day
R. Staub
T. Haskell
E. Rehme - OEPA
M. Powell- KZF

KZF, incorporated
ARCHITECTS · ENGINEERS · PLANNERS · SURVEYORS · CONSTRUCTION MANAGERS
2830 Victory Parkway, Cincinnati, Ohio 45206 (513) 281-7723

March 17, 1978

Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

Att: Mr. Roy Staub

Re: Nail Cleaning Liquid Waste

Dear Sir:

As an introduction to this letter, we have listed the sequence of events that have taken place to date.

1. On June 6, 1977, KZF met with Senco to familiarize Mike Powell with the project.

2. On June 10, 1977, letter to Senco regarding our understanding of the nail cleaning operations.

3. On June 28, 1977, revised letter of June 10, 1977, correcting operational methods.

4. Letter to Senco regarding discussions with M.S.D. dated July 21, 1977.

5. On July 25, 1977 requested authorization to proceed with Step II of our proposal dated April 12, 1977.

6. Received authorization by means of a revised purchase order dated July 28, 1977.

7. Met July 28, 1977 with Senco personnel and Paul Koch (Gates and Assoc.) to discuss methods of sampling and the test data required.

8. Final test results received by KZF on January 4, 1978.

9. Plant visit (John Wolfram) on January 11, 1978 to try to establish reasons for such wide variation of test results.

10. January 11, 1978, letter to M.S.D. requesting their acceptance of Senco's liquid waste and the related costs.

Senco Products
March 17, 1978
Page Two

11. Received reply from M.S.D. on January 13, 1978.

12. January 19, 1978, KZF contacted 10 Industrial Liquid Waste Haulers; 7 did not want to be involved; 3 indicated they would be willing to look at the analysis and then may be interested in submitting a proposal.

13. January 20, 1978, Status Report to Senco.

14. Met with Senco to discuss the wide variations and complexity of this project.

15. Received on January 24, 1978, adjustment to the test results.

16. Submitted these adjusted test results to the 3 previously mentioned waste haulers and to the Crocker Company.

17. Status Report to Senco, February 15, 1978.

18. Status Report and one proposal to Senco, March 6, 1978.

19. Test data submitted to Dr. Riley Kinman (KZF consultant) for his review and comments, March 9, 1978.

The complexity of this industrial waste and the broad range of values within the same parameters only became apparent after analyzing the test results submitted by W.E. Gates and Associates, Inc. The test results were a surprise to us as we felt they would have been more consistent within the same modes of operation. After reviewing this sequence of events, we do not feel that a final report with recommendations and costs can be accomplished in less than 3 months or some time in late June or early July, 1978.

From the costs already received total off site disposal with no pre-treatment, appears to be less and less desirable. Therefore, we must investigate the type of pretreatment and its related cost with an eye toward water reclamation. To enable us to address these problems with some assurance of success the following steps must be implemented. The type of physical-chemical treatment required to achieve the optimum solution can not rely on stoichiometric chemistry only, but must be subjected to bench scale tests or jar tests. Quite simply, this means that various chemical compounds and varied amounts of chemicals must be added to samples of your industrial waste to evaluate how they will react.

The computed amounts of chemicals required only serve as a beginning point. We anticipate that to conduct and evaluate these tests will take two months.

After, and only after, these test are completed can the type of equipment, amount of chemicals, and costs be confirmed. We feel to evaluate the equipment, obtain costs for the equipment and the chemicals and to prepare the presentations will take an additional month.

Due to the wide variance within the individual parameters and the complexity of the parameters as they interreact, we feel the additonal time is warranted.

We would welcome the opportunity to discuss these facts with Senco management.

Very truly yours,

KZF, INCORPORATED

Michael M. Powell

Michael M. Powell, PE

cc: Mr. Gary Bates, KZF
Mr. Nick Tsimaras, KZF

MMP/p

ENVIRONMENTAL DESIGN CONSULTANTS INC
ARCHITECTS • ENGINEERS • PLANNERS • SURVEYORS
[illegible] Cincinnati, Ohio, 45205 (513) [illegible]

February 15, 1978

[illegible]

[illegible]

[illegible]

[illegible]

The following [illegible] have been taken on the nail cleaning liquid [illegible].

1. [illegible] have [illegible] the data as submitted by [illegible]
[illegible]
[illegible] Waste Haulers
[illegible]
[illegible]
[illegible] Co., Inc.

2. [illegible] Waste Haulers have requested and received [illegible] for their own analysis. They feel the results [illegible] should be completed late this week [illegible] next week.

3. [illegible], indicated they would make arrangements [illegible] for their own analysis.

[illegible] indicated they would make arrangements to gather [illegible] and should be ready to submit [illegible] next week or early the following week.

[illegible] Co., Inc. will look at the analysis for compatibility [illegible] such as gravity separators, clarifiers, [illegible] filtration units.

Cleaning L[illegible]d Waste
February 15, 19[illegible]
Page [illegible]

[illegible] by the end of February we should have at least a [illegible] [illegible] disposal with no pretreatment.

ENVIRONMENTAL DESIGN CONSULTANTS INC
ARCHITECTS • ENGINEERS • PLANNERS • SURVEYORS
[illegible], Cincinnati, Ohio. 45206 (513) [illegible]

January 20, 1976

[illegible] Products, Inc.
[illegible]
[illegible], Ohio [illegible]

Attn: [illegible]

Re: [illegible] Cleaning Fluid Waste

[illegible],

On January [illegible], 197[illegible] we submitted to M.S.D. the test results received by our [illegible] and January [illegible], 197[illegible]. We have enclosed a copy of [illegible] and files. M.S.D. will not accept your [illegible] pretreatment to reduce the oil [illegible] concentrations.

[illegible] amounts to 2000 gallons a day and based on [illegible] for disposal at M.S.D. would be approximately [illegible] not include hauling nor any [illegible]

The following three organizations indicated a willingness to accept the [illegible] and we have submitted the data for their review.

[illegible]
[illegible]
[illegible]-2207)

[illegible]
[illegible] Road
[illegible] (513-[illegible]5)

[illegible]
[illegible]
[illegible]114)

[illegible] proposals [illegible] as [illegible] receive them.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

cc: [illegible]

Re: Senco Products, Inc.
Anderson Township
Greene County
Ground Water

Mr. Michael M. Powell, P.E.
KZF, Incorporated
2830 Victory Parkway
Cincinnati, Ohio 45206

May 22, 1978

Dear Mr. Powell:

Reference our telephone conversation on May 19, 1978. During that conversation we discussed the possibility of discharge of Senco's wastewater to a stream on the Senco property. The proposed receiving stream is a source of ground water recharge (the stream disappears into a nearby gravel pit). The wastewater in the receiving stream would contaminate the ground water. Ground water rejuvenation is a very slow and complex process that is not well understood. For this reason, ground water quality standards have not been developed. Without such standards as guidelines a ground water discharge permit system is not practical. Most industrial wastewaters would require treatment sufficient to bring the quality of the wastewater up to drinking water standards before we could be sure that the ground water quality was protected.

You also asked whether Ohio Revised Code § 6111.99 (Penalties) would apply in the case of Senco's wastewater discharge. General provisions of section § 6111.04 would probably be most applicable. Ordinarily, every effort is made to find an acceptable disposal practice without resorting to fines or other penalties.

Your letter dated May 17, 1978, indicated that the existing lagoons had been dammed. Assuming there is no surface leakage from the lagoons, and the liquid waste is delivered to the lagoons at the rate of about 3000 gallons per day, there must be infiltration into the ground. This method of waste disposal is a threat to ground water quality and is not acceptable.

If you have any questions or require further assistance, please feel free to call me.

Very truly yours,

James D. Pennino

James D. Pennino
District Geologist
Public Water Supply Section

JDP:sjs

State of Ohio Environmental Protection Agency
Southwest District Office
7 East Fourth Street, Dayton, Ohio 45402 • (513) 461-4670

James A. Rhodes, Governor
Ned E. Williams, P.E., Director

Jim See me on this

P

senco fastening systems

P

July 19, 1977

RECEIVED
JUL 25 1977
Ohio Environmental Protection Agency
SOUTHWEST DISTRICT

Mr. James D. Pennino
Public Water Supply Section
STATE OF OHIO ENVIRONMENTAL
PROTECTION AGENCY
Southwest District Office
7 East Fourth Street
Dayton, Ohio 45402

Dear Mr. Pennino:

In your letter of June 24, 1977, to Mr. George Juilfs, President, you stated your findings, conclusions, and recommendations pertaining to our liquid waste disposal; primarily, the use of lagoons.

In the recommendation portion of your letter, you stated that, "the occasional surface discharge from the present lagoons should be dammed". Based upon this recommendation, we have taken the necessary actions to dam the lagoons; thus, prevent surface discharge. The work to correct this situation will be completed by August 15, 1977, assuming weather permits access. Should we foresee any event that would delay our completion date, you will be advised by letter accordingly.

Your second recommendation states that, "the use of the lagoons as a method of wastewater disposal is not acceptable due to potential ground water contamination". Thus, you advised that Senco Products, Inc., must establish an environmentally acceptable alternative to lagoon disposal, and submit a preliminary plan for elimination of this disposal method by August 12, 1977.

In regard to accomplishing this recommendation, we are prepared to comply. However, I am sure you can appreciate that to develop alternatives, requires considerable investigation plus the potential of sizable investment upon implementation of the final alternative selected.

These two factors, compounded by our difficulties with previous O.E.P.A. representatives in acquiring specific information requested, possibly contributed to by our lack of understanding of your organizational procedures - regulations, leaves us with major concerns. Of utmost importance is, that we, after exerting the resources required, are assured that the results will be accomplished and comply with O.E.P.A. regulations.

In order to eliminate our concerns and attain the desired results, we must develop a working relationship, and have a commitment that information and support will be provided by the O.E.P.A. to assist in our decision-making process.

If you concur with the above, I would suggest that the following be pursued toward compliance with your recommendations concerning formulation of a preliminary plan.

First, we have retained KZF and F.E. Gates & Associates as Environmental Consultants and Laboratory Analysis-Treatment Specialists to determine;

1) Specific liquid waste volumes discharged into existing lagoons.

2) Chemical analysis of specific chemical composition and percentage in liquid discharge.

It is estimated that this study will be completed within eight weeks, or by September 15, 1977. The information derived from items one and two will be used to develop specific alternatives that can be independently evaluated. It is our best estimate that the evaluation of the individual alternatives will require 16 weeks to accomplish.

Upon defining the various alternatives, prior to evaluating each, we are anticipating that many specific questions relating to;

A) Environmental acceptability.

B) O.E.P.A. conformance standards - regulations.

C) Operating procedures, sampling, permits, reports, etc.

D) Structural specifications, etc.

must be answered for each alternative proposed.

good idea

Therefore, I am recommending that the two steps of our approach in this letter be accepted as our interim plan. Secondly, I am requesting that a meeting be scheduled at your office between September 15 and October 1, 1977, to discuss the questions outlined. Upon concluding this meeting, we will have the required information to outline the next steps of our plan and respective target dates.

In closing, upon your review of our recommended approach outlined, and written confirmation as to its acceptance, it would be appreciated if you could provide tentative dates for our suggested meeting. Upon receipt, I will confirm the date which is most suitable.

Respectfully,

SENCO PRODUCTS, INC.

N. D. Day
General Manager
Operation #1

cc: E. Rehme, Chief Industrial Wastewater Group, O.E.P.A.
R. Stein, Ground Water Division, O.E.P.A.
C. Becht, Vice-President, Engineering, SENCO
G. Juilfs, President, SENCO
J. Racer, Vice-President, Manufacturing, SENCO
R. Staub, Manager, Plant Engineering, SENCO
P. Eberle, Manager, Risk Management, SENCO

NDD/pf

senco fastening systems

November 2, 1977

RECEIVED
NOV 4 - 1977
OHIO ENVIRONMENTAL PROTECTION AGENCY SOUTH WEST DISTRICT

Mr. James D. Pennino
Public Water Supply Section
State of Ohio
Environmental Protection Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

Dear Mr. Pennino:

In my letter to you of October 3, 1977, I indicated that we hoped to complete sampling and analysis by November 1. Unfortunately, the remaining unsampled piece of equipment, our #3 Nail Cleaning Machine, is malfunctioning and we have not been able to obtain samples. We hope to have this corrected in the near future.

When we have completed our sampling and analysis, we will send the results to your office.

Sincerely,

P. A. Eberle

Peter A. Eberle
Corporate Risk Manager

PAE:jkw

cc: N. Day - Senco
R. Staub - Senco
T. Haskell - Senco
M. Powell - KZF
E. Rehme - OEPA

senco fastening systems

October 3, 1977

RECEIVED
OCT 11 1977
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

James D. Pennino
Public Water Supply Section
State of Ohio
Environmental Protection Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

Dear Mr. Pennino:

At our meeting on September 3, 1977 at Senco, we agreed that on October 1 we would report the progress to date regarding our liquid waste disposal.

In his letter of July 19 to your office, Mr. Norm Day, General Manager for Operation #1, stated that Senco was pursuing the following actions prior to establishing a final compliance plan:

1) We have retained F. E. Gates & Associates to perform the chemical analysis to determine specific chemical composition and percentages in the liquid waste.

2) We are determining specific liquid waste volumes discharged into the existing lagoons.

3) We have retained KZF to analyze the problem and evaluate possible alternative solutions for disposal of the liquid waste.

Mr. Day, in his letter, stated that we had planned to complete steps 1 and 2 by September 15. Unfortunately, our schedule has slipped somewhat in that the analysis of all the liquid wastes have not been completed. Attached to this memo is the analytical results of samples taken from our #3 Nail Cleaner and our tank truck. Analysis from samples taken from the Ransohoff Cleaning Machine and #3 Nail Cleaning Boiler will be taken during October. We hope to have all sampling completed with analysis by November 1.

We have completed the analysis of liquid waste volumes discharged into the lagoons. Attached to this memo is a log of the quantities for the period July 1 through August 31. We feel that the quantities stated on this log are representative of our normal production waste volumes.

Following completion of items 1 and 2 above, KZF has been retained to develop alternative methods of disposal of the liquid and to study each alternative as to its environmental acceptability, EPA standards conformance, necessary operating procedures, sample requirements, permits, reports, and structural specifications. Our initial time estimate is that it will require 16 weeks to accomplish this.

As soon as we receive the final analytical tests from F. E. Gates and Associates, I will forward them to your office. We would appreciate your comments concerning our outline of priorities, activities and time table as presented in Mr. Day's July 19 letter and in this letter. If you have any additional questions please don't hesitate to contact me.

Sincerely,

P. A. Eberle

Peter A. Eberle
Corporate Risk Manager

PAE:jkw

cc: E. Rehme, Chief
Industrial Waste Water Group
OEPA

N. Day, General Manager-Operation #1

R. Staub, Manager-Plant Engineering

State of Ohio Environmental Protection Agency,

March 17, 1975

Southwest District Office
7 East Fourth Street
Dayton, Ohio. 45402

Ohio EPA

Re: Hamilton County
Anderson Township
Senco Products, Inc.
Plants 1 and 2
Sewerage

James A. Rhodes
[redacted]
Governor
[redacted]
Director
Ned E. Williams

Mr. Roy R. Staub, Plant Engineer
Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

Dear Mr. Staub:

On March 13, 1975, Mr. Richard Carlton of this office inspected the sewage treatment plants serving Senco Products -- Plants #1 and #2. Mr. Carlton was accompanied by Mr. Ray Kappesser, maintenance foreman, at plant #1; and by Mr. Dale Banfill, maintenance foreman, at plant #2.

The primary purpose of these inspections was in regard to processing your Applications for NPDES Permits. Mr. Carlton determined that neither plant's discharge reached the Little Miami River and therefore that NPDES Permits are not required for either plant.

For the present we will complete processing of the permit applications on the basis that the plants are exempt and at some future date (this year) will issue orders, in the Director's name, requiring satisfactory operation and maintenance of the facilities together with submission of monthly reports of operation.

With regards to the present level of operation and maintenance of the plants, we are pleased to report that it appeared to be quite good in both cases. The discharge from plant #2 was the better of the two inasmuch as that plant is equipped with effluent filtration equipment. A review of past monthly operating reports reveals that no reports were submitted for August, September, October, and November, 1974. It also appears that no reports for plant #2 were submitted until January, 1975, even though the plant was installed in late 1973 and indicated to be placed into operation during early 1974.

The past performance of plant #1 seems to have been quite erratic from an effluent quality standpoint. Consideration should be given to the following as an effort to improve its performance:

1. The effect of the deburring process wastewater slurry,

2. The effect of food wastes from the cafeteria,

3. The average daily flow,

4. The effective hydraulic load on the plant due to the raw wastewater pumps.

It is quite possible that the deburring wastewater slurry is overloading the plant with suspended solids. It may be that these can be handled by the plant if excess sludge (solids) holding facilities are installed and a more rigorous program of in-plant solids control is maintained; or it may be that separate treatment facilities for the deburring slurry may be needed.

We suggest that you study this problem and report back to us within the next 6 months as to your findings. If you have any questions or comments, please feel free to contact this office.

Very truly yours,

Charles W. Forsthoff, P.E.
Assistant Chief
Division of Waste Management
and Engineering

CWF:sjw:RJC

cc: H. D. Jacobs, Jr., D.V.M.
Health Commissioner
cc: James Greener, OEPA

senco fastening systems

July 5, 1977

Mr. James D. Pennino
State of Ohio
Environmental Protection
Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

Dear Mr. Pennino:

As we discussed on the telephone recently, I am preparing the materials for you which you requested in your March 2nd letter. As I still do not have the information concerning the reason for water gallonage from the KZF consulting firm, I will forward the information I have to you by the end of this month.

Regards,

Peter A. Eberle | jkw

Peter A. Eberle
Corporate Risk Manager

PAE:jkw

9/6/77 Lance Products

R. Stauch
D. Ray
R. Eberle

wait for results + recom from
K2F on industrial premixes.

Will make another meeting in
October

senco fastening systems

~~Pennino~~
~~Elmer~~
File

November 2, 1977

RECEIVED
NOV - 7 1977
OHIO ENVIRONMENTAL PROTECTION AGENCY
SOUTH WEST DISTRICT

Mr. James D. Pennino
Public Water Supply Section
State of Ohio
Environmental Protection Agency
Southwest District Office
7 East Fourth Street
Dayton, OH 45402

Dear Mr. Pennino:

In my letter to you of October 3, 1977, I indicated that we hoped to complete sampling and analysis by November 1. Unfortunately, the remaining unsampled piece of equipment, our #3 Nail Cleaning Machine, is malfunctioning and we have not been able to obtain samples. We hope to have this corrected in the near future.

When we have completed our sampling and analysis, we will send the results to your office.

Sincerely,

P. A. Eberle

Peter A. Eberle
Corporate Risk Manager

PAE:jkw

cc: N. Day - Senco
R. Staub - Senco
T. Haskell - Senco
M. Powell - KZF
E. Rehme - OEPA

Penn

Ohio EPA

Re: Hamilton County
Anderson Township
Senco Products, Inc.
Industrial Wastewater

Mr. George Juilfs, President
Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

June 24, 1977

Dear Mr. Juilfs:

On February 24, 1977, Mr. John Noyes, Ohio EPA, Geologist, and I met with Mr. Roy Staub, Plant Engineer, and Mr. Pete Eberle, Risk Manager of Senco, and Mr. Tony Di Puccio of KZF Consultants. The purpose of this meeting was to familiarize Mr. Noyes and me with your industrial and sanitary wastewater disposal procedures. The following findings, conclusions and recommendations are submitted for your consideration and action:

Findings

1. Your industrial wastewater consists of spent phosphoric acid, caustic floor cleaner and water soluble coolants. The volume is roughly 6000 gallons per day, of which about 90% is spent phosphoric acid. This wastewater is discharged to a tank truck which delivers the waste to lagoons located on Senco property. During our visit, Mr. Eberle and Mr. Staub informed us that there is an unexplained excess of wastewater that is discharged to the tank truck. On March 2, 1977, I sent Mr. Eberly a letter requesting clarification of this problem. He later informed me that an investigation of the problem is being conducted. We need to know the source and composition of any wastewater. Please send me a copy of the completed investigation concerning the excess wastewater problem mentioned above.

2. The discharge of sanitary wastewater from Plant 1 is about 20,000 gallons per day. The discharge from Plant 2 is unknown. The wastewater from both plants eventually drains to gravel pits.

3. On March 14, 1977, John Noyes and I again visited the area of the lagoons to determine if there was any ground water seepage to the surface of the hillside below the lagoons. We could find no evidence of ground water seepage on the hillside. However, we did notice a small flow from the side of one of the lagoons into a ditch which drained over the hillside. This flow continues until it eventually reaches one of the gravel pits. Analysis of this discharge at a point near the bottom of the hill indicated high levels of metals.

Mr. George Juilfs
June 24, 1977
Page 2

4. Field observations and available geological information indicate that the lagoons are located over permeable soils. These soils will allow the wastewater to percolate downward into the ground water. Analysis of the wastewater delivered to the lagoons indicate high levels of metals, salts and oils. Some of these materials could result in substantial degradation of the ground water. Ground water development potential along this section of the Great Miami River is excellent and these disposal lagoons pose a hazard to the ground water quality. Previous correspondence mentions a ground water survey to have been conducted by KZF and Associates for Senco. A copy of such a survey is not in our files. Should this survey be completed, we would like to have a copy for our records.

Conclusions

1. Apparently there is an occasional surface flow from the lagoons. This flow eventually reaches the Dravo Co. gravel pit where it can easily percolate down to the ground water. The amount of flow into the ditch plus any evaporation from the lagoon surface cannot account for the influx of approximately 6000 gallons per day to the lagoons. Therefore it must be concluded that a significant quantity of wastewater is migrating downward to the ground water table.

2. The sanitary wastewater which enters the gravel pits represents some hazard to the ground water because of the high permeability of the gravel deposits. If the sanitary wastewater treatment systems are properly operated and maintained, the only chemical constituents of major concern would then be nitrate. The presence of nitrates in the ground water represents less danger to the ground water than the chemicals in the lagoons. However, some consideration should be given to the possibility of discharging the sanitary wastewater directly to the Miami River or a tributary.

Recommendations

1. The occasional surface discharge from the lagoons should be dammed.

2. Under Section 6111.04 of the Ohio Revised Code, the OEPA has the authority to control wastes which enter the waters of the State. The use of the lagoons as a method of wastewater disposal is not acceptable because of the potential for ground water contamination. Therefore, it will be necessary for Senco to establish an environmentally acceptable alternative to lagoon disposal. Submit a letter to me by August 12, 1977 describing your preliminary plans for elimination of this method of disposal.

Should you have any questions or require assistance, please feel free to call this office.

Very truly yours,

James D. Pennino

James D. Pennino, Public Water Supply Section
cc: Elmer Rehme, Chief Industrial Wastewater Group cc: Russ Stein, Ground Water Div

Ohio EPA

Re: Hamilton County
Anderson Township
Industrial Wastewater Disposal

March 2, 1977

Mr. Peter A. Eberle
Senco Products, Inc.
8485 Broadwell Road
Cincinnati, Ohio 45244

Dear Mr. Eberle:

Thank you for meeting with Mr. John Noyes and me at your Senco Products, Inc. plant on February 24, 1977. This visit enabled us to become familiar with your wastewater generating process and wastewater disposal methods. However, there are some aspects of wastewater disposal which need further clarification. The items in question are listed below:

1. What is the total quantity of process wastewater discharged to the lagoons per day?

    a. How much of this is (1) nail cleaning solution, (2) floor cleaning solution, (3) oil coolant, (4) other?

    b. List the major significant chemical constituents (i.e., phosphoric acid, wetting agent, etc.) in each of the items described in the above.

2. There appears to be an excess accumulation of process wastewater going to the disposal tank truck. If possible, please explain where this excess water is coming from and estimate how much of the total wastewater discharge can be attributed to this problem.

3. What is the total quantity of sanitary wastewater discharged from Plant 1 and Plant 2?

This information will help me in my assessment of potential ground water contamination. I appreciate your help in this effort. If you have any questions please do not hesitate to call me.

Very truly yours,

James D. Pennino

James D. Pennino, District Geologist
Public Water Supply Section

JDP/mlk

cc: Elmer Rehme, Industrial Wastewater Group

OHIO ENVIRONMENTAL PROTECTION AGENCY

FILE MEMORANDUM

WITH Letter to Mrs. Denneman - Round Bottom Rd. DATE 5-5-77

REPRESENTING ______ TIME ______

PERMIT NO. ______ PHONE NO. ______

OEPA STAFF Jim Pennino

SUBJECT Level of Nitrogen Ammonia in Well Water Hamilton Co.

Anderson Twp

NOTES & SUMMARY: FOLLOW-UP DATE ______

Sent letter to Mrs. Denneman indicating that the level of nitrogen ammonia in her well might indicate some sort of surface contamination of the well. I also told her it would be a good idea to have the well tested for bacteria by the local health department.

Signature James Pennino

OEPA-INDWW-3

INTER-OFFICE COMMUNICATION

TO: Don Day, Land Pollution Control DATE: January 15, 1976

FROM: Jeff Hosler, Public Water Supply Section - SWDO

SUBJECT: Senco Products, Inc.

After receiving the information in the accompanying IOC from Elmer Rehme, I investigated reference facility on 1/13/76 in company of Mr. Pete Eberle, Risk Manager of the entity. Mr. Eberle informed me that among his other duties, he is responsible for all matters relating to environmental control and regulations.

The geologic conditions at the lagoon sites are not accurately known. Observation showed that the lagoon sidewalls were composed of a soil with significant amounts of clay and coarse gravel. The fact that the disposal rate is about 6000 gallons per day and that, to the best of Mr. Eberle's knowledge, the lagoons have never overflowed, indicates that a significant amount of the waste is infiltrating into the ground through the lagoon bottoms.

I was not able to find any spring or seepage zones in the hill slope below the lagoons; however, this slope is completely covered by solid waste generated at the Senco plant. Most of this material appears to be cardboard, pallets, drums, etc. but constitutes a rather unsightly dump nevertheless.

I asked Mr. Eberle to obtain several samples of the waste in the lagoons and have them analyzed for the appropriate parameters. After this information is submitted, I feel OEPA should decide on some course of action, even if it only involves ground water monitoring in the vicinity of the site.

As you are aware from my evaluation of this area in reference to the proposed Anderson Township landfill, ground water supply development potential is excellent in this section of the valley and all area waste disposal operations represent some hazard to ground water quality.

Please let me know if there is any further information I can supply at this time.

pac

Issue Date: July 12, 1985
Effective Date: July 12, 1985

BEFORE THE
OHIO ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:

Senco Products, Inc.	:	Director's Final Findings
8485 Broadwell Road	:	and Orders
Cincinnati, Ohio 45244	:	

Pursuant to Section 6111.03(H) of the Ohio Revised Code, the Director of the Ohio Environmental Protection Agency (Ohio EPA) hereby makes the following Findings and issues the following Orders:

FINDINGS

1. Senco Products, Inc., hereinafter referred to as "this entity", operates a pneumatic fastening tool assembly plant located at 8485 Broadwell Road, Cincinnati, Ohio hereinafter referred to as "Plant #1".

2. This entity also operates a staple and nail production plant located at 8450 Broadwell Road, Cincinnati, Ohio, hereinafter referred to as "Plant #2".

3. In the course of operations at Plant #1 non-contact cooling water and sanitary wastewater are generated, inadequately treated and discharged to an unnamed ditch tributary to an unnamed pond located behind the landfill to the east of the facility, thence to groundwater which are waters of the State of Ohio.

4. In the course of operations at Plant #2 process and sanitary wastewater and non-contact cooling water is generated, inadequately treated and discharged to two separate unnamed ditches to an unnamed pond located behind the plant, thence to groundwater which are waters of the State of Ohio.

5. This entity is currently discharging pollutants to waters of the State at Plants #1 and #2 without an NPDES permit. This is in violation of Section 6111.04 of the Ohio Revised Code.

6. Applications for NPDES permits for both facilities were originally made on November 18, 1974 and were again made on August 9, 1984, short form C.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Vivian Davis Date 7/12/85

Ohio Environmental Protection Agency
ENTERED DIRECTOR'S JOURNAL

JUL 1 2 1985

7. The sanitary wastewater discharges from Plants #1 and #2 are not in compliance with "Best Practical Control Treatment" (BPT) technology limits. The Federal deadline for compliance with BPT limits was July 1, 1977.

8. It is necessary to require this entity to comply with all applicable environmental laws and regulations in order to safeguard the public health, safety and welfare.

9. It is technically feasible and economically reasonable to require this entity to comply with the following Orders:

ORDERS

1. This entity shall attain compliance with the effluent limitations and monitoring requirements contained in ATTACHMENT A, for the sanitary wastewater flow from Plants #1 and #2, as expeditiously as practicable. In any event this entity shall attain compliance in accordance with the schedule set forth below:

   a. Submit written report detailing all corrective action necessary to achieve compliance with effluent limits contained in ATTACHMENT A and submit a Permit to Install application with three sets of detail plans and all the information required for plan approval, if it is determined that additional facilities are necessary by July 15, 1985.

   b. Initiate construction by August 15, 1985.

   c. Submit progress report by December 31, 1985.

   d. Submit progress report by April 30, 1986.

   e. Complete construction by June 30, 1986.

   f. Achieve compliance with final effluent limits (ATTACHMENT A) by July 30, 1986.

2. This entity shall provide written notification to the Ohio EPA, Southwest District Office of the completion of Order 1b, 1e and 1f above, within 7 days of completion.

3. This entity shall initiate an effluent monitoring program beginning on July 1, 1985 for the process wastewater outfall at plant #2, as outlined in ATTACHMENT B. After OEPA review of this data appropriate effluent limits will be established for inclusion in the NPDES permit.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Susan Davis Date 7/12/85

Ohio Environmental Protection Agency
ENTERED DIRECTOR'S JOURNAL

JUL 12 1985

4. The monitoring data required by ATTACHMENTS A & B shall be reported on the Ohio EPA report form (EPA Sur-1) on a monthly basis. Individual reports for each sampling station for each month are to be received no later than the 15th day of the next month. The original plus first copy of the report form must be signed and mailed to:

Ohio Environmental Protection Agency
Technical Records Section
Post Office Box 1049
Columbus, Ohio 43216-1049

Warren W. Tyler
Director

July 12, 1985
Date

WAIVER

Senco Products, Inc. hereby consents to the entry of these Findings and Orders on the Director's Journal and hereby waives any rights it may have to appeal the issuance of these Findings and Orders to the Environmental Board of Review or to seek judicial review of the issuance of these Findings and Orders, in law or in equity.

James P. Walsh
Authorized Representative

6/26/85
Date

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Vivian Davis Date 7/12/85

Ohio Environmental Protection Agency
ENTERED DIRECTOR'S JOURNAL
JUL 12 1985

ATTACHMENT A

1. Final effluent limitations and monitoring requirements for sanitary wastewater discharge at Plant #1 and Plant #2, during the period beginning on July 30, 1986, and lasting until an NPDES permit is issued, this entity is authorized to discharge in accordance with the following limitations and monitoring requirements.

EFFLUENT CHARACTERISTICS			DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
			Concentration Other Units (Specify)		Loading kg/day			
Code	REPORTING UNITS	PARAMETER	30 day	Daily	30 day	Daily	Meas. Freq.	Sample Type
50050	MGD	Flow	-	-	-	-	Daily	24 hr. total
00530	mg/l	Total Suspended Solids	12	18	-	-	2/month	grab
00310	mg/l	BOD	10	15	-	-	2/month	grab
00610	mg/l	Ammonia-N	2.0	3.0	-	-	2/month	grab
31616	#100 ml	Fecal Coliform	1000	2000			2/month	grab
50060	mg/l	Total Residual Chlorine	-	0.5	-	-	daily	grab

2. The pH shall not be less than 6.5 s.u. nor greater than 9.0 s.u. and shall be monitored 2/month by grab sample.

3. Samples are to be taken at the following locations:

   Plant 1: sanitary wastewater discharge prior to unnamed ditch tributary to an unnamed pond located behind the landfill to the east of the facility.

   Plant 2: sanitary wastewater discharge prior to unnamed ditch tributary to an unnamed pond located behind the plant.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Vivian Davis Date 7/12/85

Ohio Environmental Protection Agency
ENTERED DIRECTOR'S JOURNAL

JUL 1 2 1985

ATTACHMENT B

1. Interim effluent limitations and monitoring requirements for the process wastewater discharge at Plant #2, during the period beginning on July 1, 1985, and lasting until an NPDES permit is issued, this entity is authorized to discharge in accordance with the following effluent limitations and monitoring requirements.

EFFLUENT CHARACTERISTICS			DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
			Concentration Other Units (Specify)		Loading kg/day			
REPORTING Code	UNITS	PARAMETER	30 day	Daily	30 day	Daily	Meas. Freq.	Sample Type
50050	MGD	Flow	-	-	-	-	Daily	24 hr. total
01032	ug/l	Hexavalent Chromium	-	-	-	-	2/month	composite
01042	ug/l	Copper, total	-	-	-	-	2/month	composite
01051	ug/l	Lead total	-	-	-	-	2/month	composite
32730	ug/l	phenol	-	-	-	-	2/month	composite
00720	mg/l	Cyanide, total	-	-	-	-	2/month	composite
05300	ug/l	Suspended Solids, total	-	-	-	-	2/month	composite
01027	ug/l	Cadmium, total	-	-	-	-	2/month	composite
00335	mg/l	COD	-	-	-	-	2/month	composite

2. The pH shall be monitored twice per month by grab sample.

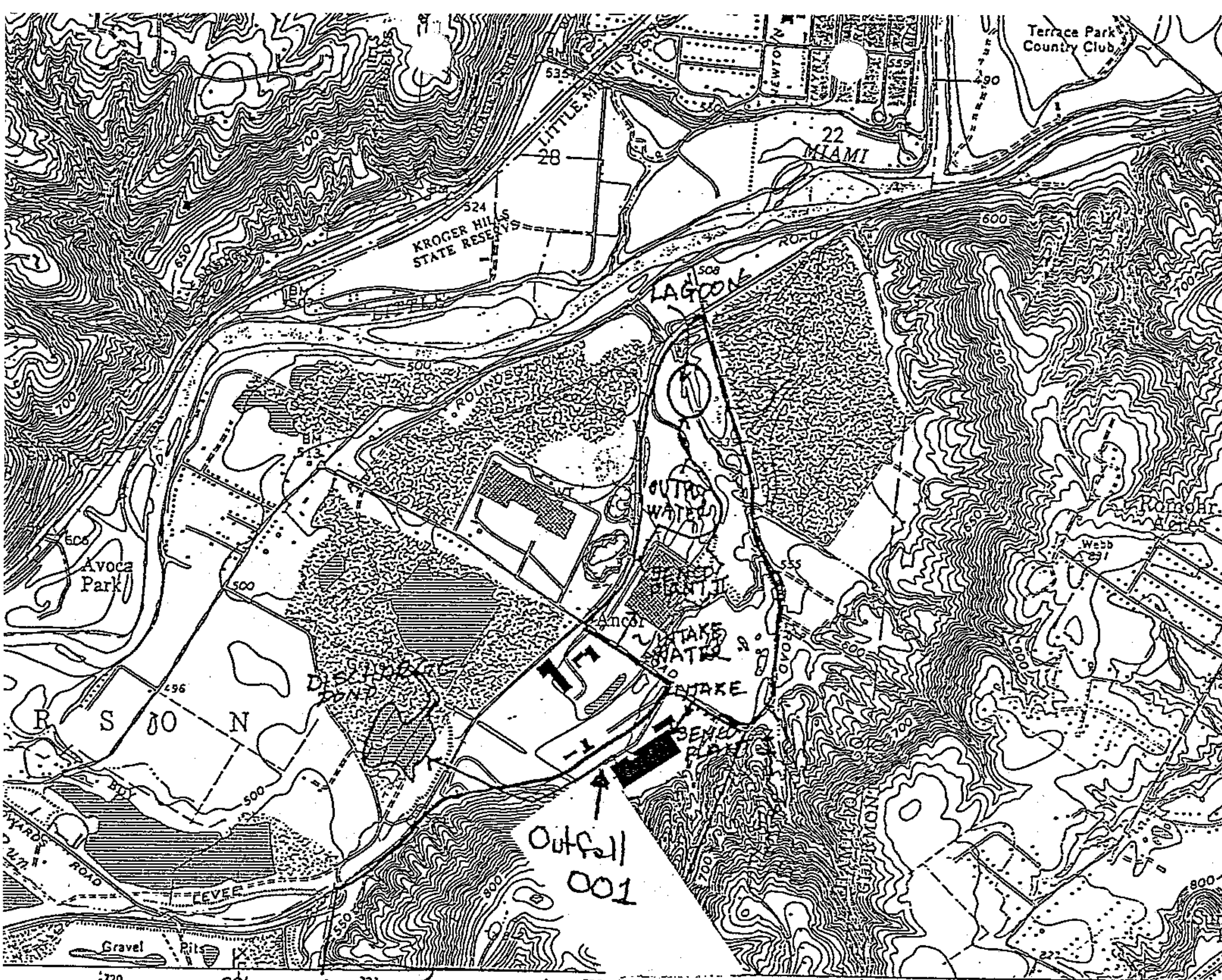
3. Samples are to be taken at the process wastewater discharge prior to mixing with the non-contact cooling water.

I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Vivian Davis Date 7/12/85

Ohio Environmental Protection Agency
ENTERED DIRECTOR'S JOURNAL

JUL 1 2 1985



LEGAL BOUNDARIES OF FACILITY

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

MN GN

3½° 62 MILS

1°42' 30 MILS

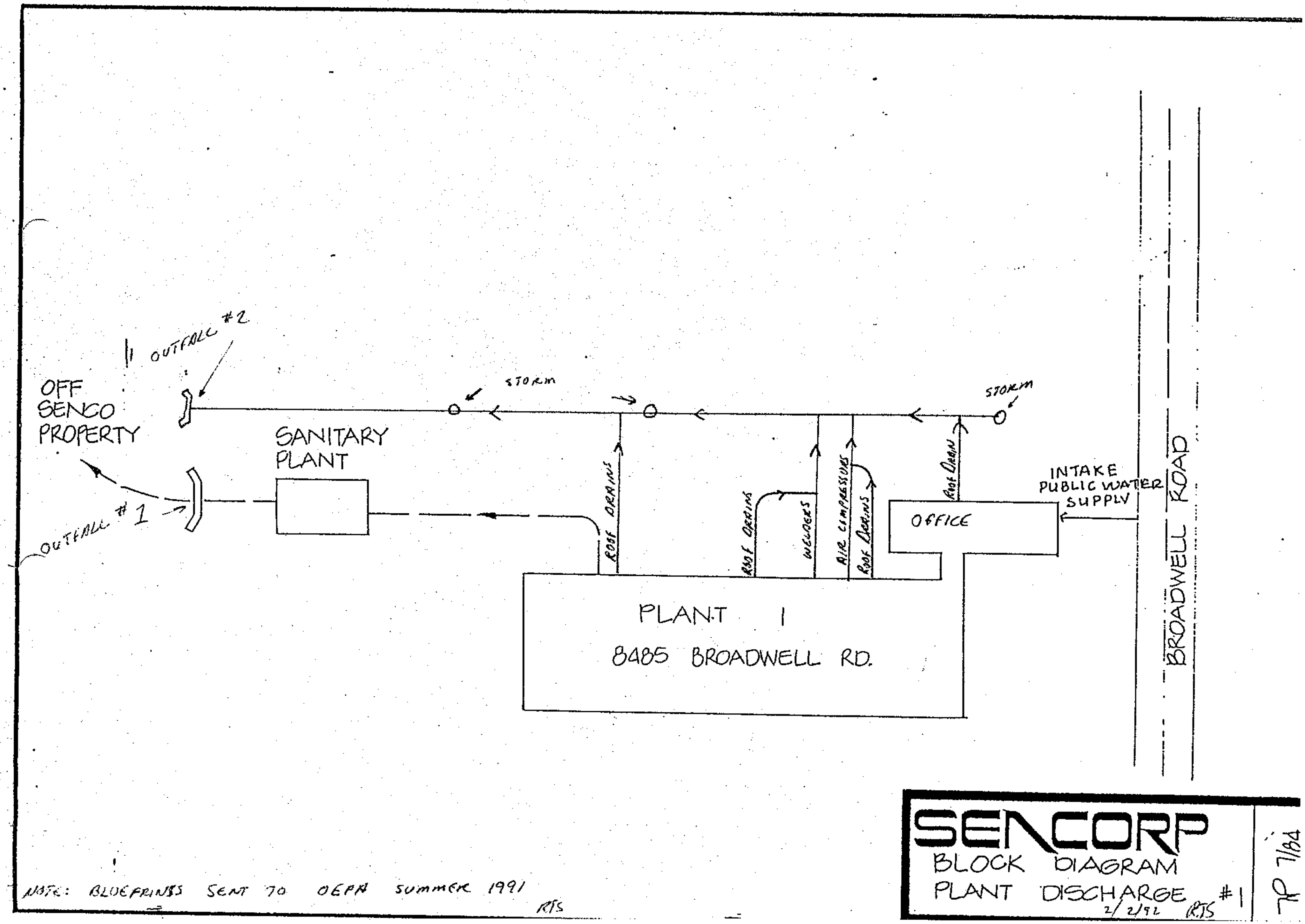
GRID AND 1988 MAGNETIC NORTH
ECLINATION AT CENTER OF SHEET

private inholdings within the boundaries of
r State reservations shown on this map

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY
DENVER, COLORADO 80225 OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

Revisions shown
with State of OH
1984 and other
Map edited 198

Senco Products (Plants I & II)


OUTFALL #2
OFF SENCO PROPERTY
STORM
STORM
SANITARY PLANT
OUTFALL #1
ROOF DRAINS
ROOF DRAINS
WELDERS
AIR COMPRESSORS
ROOF DRAINS
ROOF DRAIN
OFFICE
INTAKE PUBLIC WATER SUPPLY
BROADWELL ROAD
PLANT 1
8485 BROADWELL RD.
NOTE: BLUEPRINTS SENT TO OEPA SUMMER 1991
RTS
SENCORP
BLOCK DIAGRAM
PLANT DISCHARGE #1
2/2/92 RTS

NPDES File

MEC

Application No. OH0046493

Issue Date: June 6, 2006

Effective Date: July 1, 2006

Expiration Date: June 30, 2011

RECEIVED
OHIO EPA

JUN 08 2006

SOUTHWEST DISTRICT

Ohio Environmental Protection Agency
Authorization to Discharge Under the
National Pollutant Discharge Elimination System

In compliance with the provisions of the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251 et. seq., hereinafter referred to as the "Act"), and the Ohio Water Pollution Control Act (Ohio Revised Code Section 6111),

Senco Products, Inc.

is authorized by the Ohio Environmental Protection Agency, hereinafter referred to as "Ohio EPA," to discharge from the Senco Products, Inc. - Plant 1 wastewater treatment works located at 8485 Broadwell Road, Cincinnati, Ohio, Hamilton County and discharging to an unnamed tributary to a gravel pit impoundment to the Little Miami River in accordance with the conditions specified in Parts I, II, III, IV, V and VI of this permit.

This permit is conditioned upon payment of applicable fees as required by Section 3745.11 of the Ohio Revised Code.

This permit and the authorization to discharge shall expire at midnight on the expiration date shown above. In order to receive authorization to discharge beyond the above date of expiration, the permittee shall submit such information and forms as are required by the Ohio EPA no later than 180 days prior to the above date of expiration.

Joseph P. Koncelik

Joseph P. Koncelik
Director

Total Pages: 30

art I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

. During the period beginning on the effective date and lasting until the expiration date, the permittee is authorized to discharge in ccordance with the following limitations and monitoring requirements from outfall 1IS00003001. See Part II, OTHER REQUIREMENTS, or locations of effluent sampling.

'able - Final Outfall - 001 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
)0010 - Water Temperature - C	-	-	-	-	-	-	-	1/Week	Grab	All
)0083 - Color, Severity - Units	-	-	-	-	-	-	-	1/Day	Estimate	All
)0300 - Dissolved Oxygen - mg/l	-	5.0	-	-	-	-	-	1/Week	Grab	All
)0400 - pH - S.U.	9.0	6.5	-	-	-	-	-	1 / 2 Weeks	Grab	All
)0530 - Total Suspended Solids - mg/l	18	-	-	12	0.682	-	0.455	1 / 2 Weeks	Grab	All
)0610 - Nitrogen, Ammonia (NH3) - mg/l	3.0	-	-	2.0	0.114	-	0.0757	1 / 2 Weeks	Grab	All
)1330 - Odor, Severity - Units	-	-	-	-	-	-	-	1/Day	Estimate	All
)1350 - Turbidity, Severity - Units	-	-	-	-	-	-	-	1/Day	Estimate	All
31616 - Fecal Coliform - #/100 ml	2000	-	-	1000	-	-	-	1 / 2 Weeks	Grab	Summer
50050 - Flow Rate - MGD	-	-	-	-	-	-	-	1/Day	Estimate	All
50060 - Chlorine, Total Residual - mg/l	0.019	-	-	-	-	-	-	1 / 2 Weeks	Grab	Summer
80082 - CBOD 5 day - mg/l	15	-	-	10	0.568	-	0.379	1 / 2 Weeks	Grab	All

Notes for Station Number 1IS00003001:

This outfall is limited to treated effluent from a sanitary sewage wastewater treatment works. No process wastewater shall be released to the anitary sewage treatment works.

* Effluent loadings based on average design flow of 0.01 MGD.

Total Residual Chlorine - See Part II, Item G.

Color, Odor and Turbidity - See Part II, Item E.

Part I, A. - FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting until the expiration date, the permittee is authorized to discharge in accordance with the following limitations and monitoring requirements from outfall 1IS00003002. See Part II, OTHER REQUIREMENTS, for locations of effluent sampling.

Notes for Station Number 1IS00003002:

- This outfall is limited to stormwater, free from process waste and other contaminants.

- Sampling shall be performed when discharging. If NO DISCHARGE OCCURS DURING THE ENTIRE MONTH, report "AL" in the first column of the first day of the month on the 4500 Form (Monthly Operating Report). A signature is still required.

- See Parts IV, V, and VI for this outfall.

Part I, B. - SLUDGE MONITORING REQUIREMENTS

1. Sludge Monitoring. During the period beginning on the effective date and lasting until the expiration date, the permittee shall monitor the treatment works' final sludge at Station Number 1IS00003588, and report to the Ohio EPA in accordance with the following table. See Part II, OTHER REQUIREMENTS, for location of sludge sampling.

Table - Sludge Monitoring - 588 - Final

Effluent Characteristic	Discharge Limitations							Monitoring Requirements		
	Concentration Specified Units				Loading* kg/day					
Parameter	Maximum	Minimum	Weekly	Monthly	Daily	Weekly	Monthly	Measuring Frequency	Sampling Type	Monitoring Months
70316 - Sludge Weight - Dry Tons	-	-	-	-	-	-	-	1/Year	Total	December
80991 - Sludge Volume, Gallons - Gals	-	-	-	-	-	-	-	1/Year	Total	December

NOTES for Station Number 1IS00003588:

- Monitoring is required when sewage sludge is removed from the Permittee's facility for transfer to another NPDES permit holder. Monthly Operating Report (MOR) data shall be submitted in December. If no sewage sludge is removed from the Permittee's facility during the reporting period, report "AL" in the first column of the first day of the 4500 Form. A signature is still required.

- See Part II, Item I.

Part II, OTHER REQUIREMENTS

A. The wastewater treatment works must be under supervision of a Class I State certified operator as required by rule 3745-7- 02 of the Ohio Administrative Code.

B. Description of the location of the required sampling stations are as follows:

Sampling Station	Description of Location
1IS00003001	Final effluent to unnamed trib of gravel quarry to Little Miami River (Lat: 39N 07' 45"; Long: 84W 18' 45")
1IS00003002	Storm water outfall to unnamed trib of gravel quarry to Little Miami River (Lat: 39N 07' 45"; Long: 84W 18' 54")
1IS00003588.	Sludge hauled for disposal a Publicly Owned Treatment Works

C. This permit shall be modified, or alternatively, revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved.

1. Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
2. Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

D. All parameters, except flow, need not be monitored on days when the plant is not normally staffed (Saturdays, Sundays, and Holidays). On those days, report "AN" on the monthly report form.

E. If Severity Units are required for Turbidity, Odor, or Color, use the following table to determine the value between 0 and 4 that is reported.

REPORTED VALUE*	SEVERITY DESCRIPTION	TURBIDITY	ODOR	COLOR
0	None	Clear	None	Colorless
1	Mild			
2	Moderate	Light Solids	Musty	Grey
3	Serious			
4	Extreme	Heavy Solids	Septic	Black

* Interpolate between the descriptive phrases.

F. Grab samples shall be collected at such times and locations, and in such fashion, as to be representative of the facility's performance.

G. The parameters below have had effluent limitations established that are below the Ohio EPA Quantification Level (OEPA QL) for the approved analytical procedure promulgated at 40 CFR 136. OEPA QLs may be expressed as Practical Quantification Levels (PQL) or Minimum Levels (ML).

Compliance with an effluent limit that is below the OEPA QL is determined in accordance with ORC Section 6111.13 and OAC Rule 3745-33-07(C). For maximum effluent limits, any value reported below the OEPA QL shall be considered in compliance with the effluent limit. For average effluent limits, compliance shall be determined by taking the arithmetic mean of values reported for a specified averaging period, using zero (0) for any value reported at a concentration less than the OEPA QL, and comparing that mean to the appropriate average effluent limit. An arithmetic mean that is less than or equal to the average effluent limit shall be considered in compliance with that limit.

The permittee must utilize the lowest available detection method currently approved under 40 CFR Part 136 for monitoring these parameters.

REPORTING:

All analytical results, even those below the OEPA QL (listed below), shall be reported. Analytical results are to be reported as follows:

1. Results above the QL: Report the analytical result for the parameter of concern.

2. Results above the MDL, but below the QL: Report the analytical result, even though it is below the QL.

3. Results below the MDL: Analytical results below the method detection limit shall be reported as "below detection" using the reporting code "AA".

The following table of quantification levels will be used to determine compliance with NPDES permit limits:

Parameter.	PQL.	ML
Chlorine, Total Residual	0.050 mg/l.	--

This permit may be modified, or, alternatively, revoked and reissued, to include more stringent effluent limits or conditions if information generated as a result of the conditions of this permit indicate the presence of these pollutants in the discharge at levels above the water quality based effluent limit (WQBEL).

H. Final permit limitations based on preliminary or approved waste load allocations are subject to change based on modifications to or finalization of the allocation or report or changes to Water Quality Standards. Monitoring requirements and/or special conditions of this permit are subject to change based on regulatory or policy changes.

I. Not later than January 31 of each calendar year, the permittee shall submit two (2) copies of a report summarizing the sludge disposal and/or reuse activities of the facility during the previous year. One copy of the report shall be sent to the Ohio EPA, Division of Surface Water, Central Office, and one copy of the report shall be sent to the appropriate Ohio EPA District Office. This report shall address:

1. Amount of sludge disposed of/reused in dry tons.

2. Method(s) of disposal/reuse.

3. Summary of all analyses made on the sludge, including any priority pollutant scans that may have been performed. (If a priority pollutant scan has been conducted as a part of the pretreatment program, the most recent analysis should be submitted.)

4. Problems encountered including any complaints received. The cause or reason for the problem and corrective actions taken to solve the problem should also be included. Any incidents of interference with the method of sludge disposal shall be identified, along with the cause of interference (i.e., excessive metals concentration, contaminated sludge, etc.) and the corrective actions taken.

PART III - GENERAL CONDITIONS

1. DEFINITIONS

"Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

"Average weekly" discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week. Each of the following 7-day periods is defined as a calendar week: Week 1 is Days 1 - 7 of the month; Week 2 is Days 8 - 14; Week 3 is Days 15 - 21; and Week 4 is Days 22 - 28. If the "daily discharge" on days 29, 30 or 31 exceeds the "average weekly" discharge limitation, Ohio EPA may elect to evaluate the last 7 days of the month as Week 4 instead of Days 22 - 28. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"Average monthly" discharge limitation means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month. Compliance with fecal coliform bacteria or E coli bacteria limitations shall be determined using the geometric mean.

"85 percent removal" means the arithmetic mean of the values for effluent samples collected in a period of 30 consecutive days shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period.

"Absolute Limitations" Compliance with limitations having descriptions of "shall not be less than," "nor greater than," "shall not exceed," "minimum," or "maximum" shall be determined from any single value for effluent samples and/or measurements collected.

"Net concentration" shall mean the difference between the concentration of a given substance in a sample taken of the discharge and the concentration of the same substances in a sample taken at the intake which supplies water to the given process. For the purpose of this definition, samples that are taken to determine the net concentration shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"Net Load" shall mean the difference between the load of a given substance as calculated from a sample taken of the discharge and the load of the same substance in a sample taken at the intake which supplies water to given process. For purposes of this definition, samples that are taken to determine the net loading shall always be 24-hour composite samples made up of at least six increments taken at regular intervals throughout the plant day.

"MGD" means million gallons per day.

"mg/l" means milligrams per liter.

"ug/l" means micrograms per liter.

"ng/l" means nanograms per liter.

"S.U." means standard pH unit.

"kg/day" means kilograms per day.

"Reporting Code" is a five digit number used by the Ohio EPA in processing reported data. The reporting code does not imply the type of analysis used nor the sampling techniques employed.

"Quarterly (1/Quarter) sampling frequency" means the sampling shall be done in the months of March, June, August, and December, unless specificially identified otherwise in the Effluent Limitations and Monitoring Requirements table.

"Yearly (1/Year) sampling frequency" means the sampling shall be done in the month of September, unless specificially identified otherwise in the effluent limitations and monitoring requirements table.

"Semi-annual (2/Year) sampling frequency" means the sampling shall be done during the months of June and December, unless specificially identified otherwise.

"Winter" shall be considered to be the period from November 1 through April 30.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Summer" shall be considered to be the period from May 1 through October 31.

"Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

"Sewage sludge" means a solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works as defined in section 6111.01 of the Revised Code. "Sewage sludge" includes, but is not limited to, scum or solids removed in primary, secondary, or advanced wastewater treatment processes. "Sewage sludge" does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator, grit and screenings generated during preliminary treatment of domestic sewage in a treatment works, animal manure, residue generated during treatment of animal manure, or domestic septage.

"Sewage sludge weight" means the weight of sewage sludge, in dry U.S. tons, including admixtures such as liming materials or bulking agents. Monitoring frequencies for sewage sludge parameters are based on the reported sludge weight generated in a calendar year (use the most recent calendar year data when the NPDES permit is up for renewal).

"Sewage sludge fee weight" means the weight of sewage sludge, in dry U.S. tons, excluding admixtures such as liming materials or bulking agents. Annual sewage sludge fees, as per section 3745.11(Y) of the Ohio Revised Code, are based on the reported sludge fee weight for the most recent calendar year.

2. GENERAL EFFLUENT LIMITATIONS

The effluent shall, at all times, be free of substances:

A. In amounts that will settle to form putrescent, or otherwise objectionable, sludge deposits; or that will adversely affect aquatic life or water fowl;

B. Of an oily, greasy, or surface-active nature, and of other floating debris, in amounts that will form noticeable accumulations of scum, foam or sheen;

C. In amounts that will alter the natural color or odor of the receiving water to such degree as to create a nuisance;

D. In amounts that either singly or in combination with other substances are toxic to human, animal, or aquatic life;

E. In amounts that are conducive to the growth of aquatic weeds or algae to the extent that such growths become inimical to more desirable forms of aquatic life, or create conditions that are unsightly, or constitute a nuisance in any other fashion;

F. In amounts that will impair designated instream or downstream water uses.

3. FACILITY OPERATION AND QUALITY CONTROL

All wastewater treatment works shall be operated in a manner consistent with the following:

A. At all times, the permittee shall maintain in good working order and operate as efficiently as possible all treatment or control facilities or systems installed or used by the permittee necessary to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with conditions of the permit.

B. The permittee shall effectively monitor the operation and efficiency of treatment and control facilities and the quantity and quality of the treated discharge.

C. Maintenance of wastewater treatment works that results in degradation of effluent quality shall be scheduled during non-critical water quality periods and shall be carried out in a manner approved by Ohio EPA as specified in the Paragraph in the PART III entitled, "UNAUTHORIZED DISCHARGES".

4. REPORTING

A. Monitoring data required by this permit may be submitted in hardcopy format on the Ohio EPA 4500 report form pre-printed by Ohio EPA or an approved facsimile. Ohio EPA 4500 report forms for each individual sampling station are to be received no later than the 15th day of the month following the month-of-interest. The original report form must be signed and mailed to:

Ohio Environmental Protection Agency
Lazarus Government Center
Division of Surface Water
Enforcement Section ES/MOR
P.O. Box 1049
Columbus, Ohio 43216-1049

Monitoring data may also be submitted electronically using Ohio EPA developed SWIMware software. Data must be transmitted to Ohio EPA via electronic mail or the bulletin board system by the 20th day of the month following the month-of-interest. A Surface Water Information Management System (SWIMS) Memorandum of Agreement (MOA) must be signed by the responsible official and submitted to Ohio EPA to receive an authorized Personal Identification Number (PIN) prior to sending data electronically. A hardcopy of the Ohio EPA 4500 form must be generated via SWIMware, signed and maintained onsite for records retention purposes.

B. If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified below, the results of such monitoring shall be included in the calculation and reporting of the values required in the reports specified above.

C. Analyses of pollutants not required by this permit, except as noted in the preceding paragraph, shall not be reported on Ohio EPA report form (4500) but records shall be retained as specified in the paragraph entitled "RECORDS RETENTION".

5. SAMPLING AND ANALYTICAL METHOD

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored flow. Test procedures for the analysis of pollutants shall conform to regulation 40 CFR 136, "Test Procedures For The Analysis of Pollutants" unless other test procedures have been specified in this permit. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals to insure accuracy of measurements.

6. RECORDING OF RESULTS

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record the following information:

A. The exact place and date of sampling; (time of sampling not required on EPA 4500)

B. The person(s) who performed the sampling or measurements;

C. The date the analyses were performed on those samples;

D. The person(s) who performed the analyses;

E. The analytical techniques or methods used; and

F. The results of all analyses and measurements.

7. RECORDS RETENTION

The permittee shall retain all of the following records for the wastewater treatment works for a minimum of three years except those records that pertain to sewage sludge disposal, use, storage, or treatment, which shall be kept for a minimum of five years, including:

A. All sampling and analytical records (including internal sampling data not reported);

B. All original recordings for any continuous monitoring instrumentation;

C. All instrumentation, calibration and maintenance records;

D. All plant operation and maintenance records;

E. All reports required by this permit; and

F. Records of all data used to complete the application for this permit for a period of at least three years, or five years for sewage sludge, from the date of the sample, measurement, report, or application.

These periods will be extended during the course of any unresolved litigation, or when requested by the Regional Administrator or the Ohio EPA. The three year period, or five year period for sewage sludge, for retention of records shall start from the date of sample, measurement, report, or application.

8. AVAILABILITY OF REPORTS

Except for data determined by the Ohio EPA to be entitled to confidential status, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the appropriate district offices of the Ohio EPA. Both the Clean Water Act and Section 6111.05 Ohio Revised Code state that effluent data and receiving water quality data shall not be considered confidential.

9. DUTY TO PROVIDE INFORMATION

The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking, and reissuing, or terminating the permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

10. RIGHT OF ENTRY

The permittee shall allow the Director or an authorized representative upon presentation of credentials and other documents as may be required by law to:

A. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit.

B. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit.

C. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit.

D. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act, any substances or parameters at any location.

11. UNAUTHORIZED DISCHARGES

A. Bypassing or diverting of wastewater from the treatment works is prohibited unless:

1. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

2. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of downtime. This condition is not satisfied if adequate back up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

3. The permittee submitted notices as required under paragraph D. of this section,

B. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.

C. The Director may approve an unanticipated bypass after considering its adverse effects, if the Director determines that it has met the three conditions listed in paragraph 11.A. of this section.

D. The permittee shall submit notice of an unanticipated bypass as required in section 12. A.

E. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded if that bypass is for essential maintenance to assure efficient operation.

12. NONCOMPLIANCE NOTIFICATION

A. The permittee shall by telephone report any of the following within twenty-four (24) hours of discovery at (toll free) 1-800-282-9378:

1. Any noncompliance which may endanger health or the environment;

2. Any unanticipated bypass which exceeds any effluent limitation in the permit; or

3. Any upset which exceeds any effluent limitation in the permit.

4. Any violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in the permit.

B. For the telephone reports required by Part 12.A., the following information must be included:

1. The times at which the discharge occurred, and was discovered;

2. The approximate amount and the characteristics of the discharge;

3. The stream(s) affected by the discharge;

4. The circumstances which created the discharge;

5. The names and telephone numbers of the persons who have knowledge of these circumstances;

6. What remedial steps are being taken; and

7. The names and telephone numbers of the persons responsible for such remedial steps.

C. These telephone reports shall be confirmed in writing within five days of the discovery of the discharge and/or noncompliance and submitted to the appropriate Ohio EPA district office. The report shall include the following:

1. The limitation(s) which has been exceeded;

2. The extent of the exceedance(s);

3. The cause of the exceedance(s);

4. The period of the exceedance(s) including exact dates and times;

5. If uncorrected, the anticipated time the exceedance(s) is expected to continue, and

6. Steps being taken to reduce, eliminate, and/or prevent occurrence of the exceedance(s).

D. Compliance Schedule Events:

If the permittee is unable to meet any date for achieving an event, as specified in the schedule of compliance, the permittee shall submit a written report to the appropriate district office of the Ohio EPA within 14 days of becoming aware of such situation. The report shall include the following:

1. The compliance event which has been or will be violated;

2. The cause of the violation;

3. The remedial action being taken;

4. The probable date by which compliance will occur; and

5. The probability of complying with subsequent and final events as scheduled.

E. The permittee shall report all instances of noncompliance not reported under paragraphs A, B, or C of this section, at the time monitoring reports are submitted. The reports shall contain the information listed in paragraphs B and C of this section.

F. Where the permittee becomes aware that it failed to submit any relevant application or submitted incorrect information in a permit application or in any report to the director, it shall promptly submit such facts or information.

13. RESERVED

14. DUTY TO MITIGATE

The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

15. AUTHORIZED DISCHARGES

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant identified in this permit more frequently than, or at a level in excess of, that authorized by this permit shall constitute a violation of the terms and conditions of this permit. Such violations may result in the imposition of civil and/or criminal penalties as provided for in Section 309 of the Act and Ohio Revised Code Sections 6111.09 and 6111.99.

16. DISCHARGE CHANGES

The following changes must be reported to the appropriate Ohio EPA district office as soon as practicable:

A. For all treatment works, any significant change in character of the discharge which the permittee knows or has reason to believe has occurred or will occur which would constitute cause for modification or revocation and reissuance. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. Notification of permit changes or anticipated noncompliance does not stay any permit condition.

B. For publicly owned treatment works:

1. Any proposed plant modification, addition, and/or expansion that will change the capacity or efficiency of the plant;

2. The addition of any new significant industrial discharge; and

3. Changes in the quantity or quality of the wastes from existing tributary industrial discharges which will result in significant new or increased discharges of pollutants.

C. For non-publicly owned treatment works, any proposed facility expansions, production increases, or process modifications, which will result in new, different, or increased discharges of pollutants.

Following this notice, modifications to the permit may be made to reflect any necessary changes in permit conditions, including any necessary effluent limitations for any pollutants not identified and limited herein. A determination will also be made as to whether a National Environmental Policy Act (NEPA) review will be required. Sections 6111.44 and 6111.45, Ohio Revised Code, require that plans for treatment works or improvements to such works be approved by the Director of the Ohio EPA prior to initiation of construction.

D. In addition to the reporting requirements under 40 CFR 122.41(l) and per 40 CFR 122.42(a), all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:

1. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis of any toxic pollutant which is not limited in the permit. If that discharge will exceed the highest of the "notification levels" specified in 40 CFR Sections 122.42(a)(1)(i) through 122.42(a)(1)(iv).

2. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the "notification levels" specified in 122.42(a)(2)(i) through 122.42(a)(2)(iv).

17. TOXIC POLLUTANTS

The permittee shall comply with effluent standards or prohibitions established under Section 307 (a) of the Clean Water Act for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement. Following establishment of such standards or prohibitions, the Director shall modify this permit and so notify the permittee.

18. PERMIT MODIFICATION OR REVOCATION

A. After notice and opportunity for a hearing, this permit may be modified or revoked, by the Ohio EPA, in whole or in part during its term for cause including, but not limited to, the following:

1. Violation of any terms or conditions of this permit;

2. Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or

3. Change in any condition that requires either a temporary or permanent reduction or elimination of the permitted discharge.

B. Pursuant to rule 3745-33-04, Ohio Administrative Code, the permittee may at any time apply to the Ohio EPA for modification of any part of this permit. The filing of a request by the permittee for a permit modification or revocation does not stay any permit condition. The application for modification should be received by the appropriate Ohio EPA district office at least ninety days before the date on which it is desired that the modification become effective. The application shall be made only on forms approved by the Ohio EPA.

19. TRANSFER OF OWNERSHIP OR CONTROL

This permit may be transferred or assigned and a new owner or successor can be authorized to discharge from this facility, provided the following requirements are met:

A. The permittee shall notify the succeeding owner or successor of the existence of this permit by a letter, a copy of which shall be forwarded to the appropriate Ohio EPA district office. The copy of that letter will serve as the permittee's notice to the Director of the proposed transfer. The copy of that letter shall be received by the appropriate Ohio EPA district office sixty (60) days prior to the proposed date of transfer;

B. A written agreement containing a specific date for transfer of permit responsibility and coverage between the current and new permittee (including acknowledgement that the existing permittee is liable for violations up to that date, and that the new permittee is liable for violations from that date on) shall be submitted to the appropriate Ohio EPA district office within sixty days after receipt by the district office of the copy of the letter from the permittee to the succeeding owner;

At anytime during the sixty (60) day period between notification of the proposed transfer and the effective date of the transfer, the Director may prevent the transfer if he concludes that such transfer will jeopardize compliance with the terms and conditions of the permit. If the Director does not prevent transfer, he will modify the permit to reflect the new owner.

20. OIL AND HAZARDOUS SUBSTANCE LIABILITY

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Clean Water Act.

21. SOLIDS DISPOSAL

Collected grit and screenings, and other solids other than sewage sludge, shall be disposed of in such a manner as to prevent entry of those wastes into waters of the state, and in accordance with all applicable laws and rules.

22. CONSTRUCTION AFFECTING NAVIGABLE WATERS

This permit does not authorize or approve the construction of any onshore or offshore physical structures or facilities or the undertaking of any work in any navigable waters.

23. CIVIL AND CRIMINAL LIABILITY

Except as exempted in the permit conditions on UNAUTHORIZED DISCHARGES or UPSETS, nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance.

24. STATE LAWS AND REGULATIONS

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act.

25. PROPERTY RIGHTS

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

26. UPSET

The provisions of 40 CFR Section 122.41(n), relating to "Upset," are specifically incorporated herein by reference in their entirety. For definition of "upset," see Part III, Paragraph 1, DEFINITIONS.

27. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

28. SIGNATORY REQUIREMENTS

All applications submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR 122.22.

All reports submitted to the Director shall be signed and certified in accordance with the requirements of 40 CFR Section 122.22.

29. OTHER INFORMATION

A. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

B. ORC 6111.99 provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

C. ORC 6111.99 states that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $25,000 per violation.

D. ORC 6111.99 provides that any person who violates Sections 6111.04, 6111.042, 6111.05, or division (A) of Section 6111.07 of the Revised Code shall be fined not more than $25,000 or imprisoned not more than one year, or both.

30. NEED TO HALT OR REDUCE ACTIVITY

40 CFR 122.41(c) states that it shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with conditions of this permit.

31. APPLICABLE FEDERAL RULES

All references to 40 CFR in this permit mean the version of 40 CFR which is effective as of the effective date of this permit.

32. AVAILABILITY OF PUBLIC SEWERS

Not withstanding the issuance or non-issuance of an NPDES permit to a semi-public disposal system, whenever the sewage system of a publicly owned treatment works becomes available and accessible, the permittee operating any semi-public disposal system shall abandon the semi-public disposal system and connect it into the publicly owned treatment works.

Part IV. STORM WATER POLLUTION PREVENTION PLANS

A storm water pollution prevention plan (plan) shall be developed to address each outfall that discharges to waters of the state that contains storm water associated with industrial activity. Storm water pollution prevention plans shall be prepared in accordance with good engineering practices. The plan shall identify potential sources of pollution which may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. In addition, the plan shall describe and ensure the implementation of practices which are to be used to reduce the pollutants in storm water discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. Facilities must implement the provisions of the storm water pollution prevention plan required under this part as a condition of this permit.

A. Deadlines for Plan Preparation and Compliance.

1. The plan for a storm water discharge associated with industrial activity:

   a. shall be prepared within six months of the effective date of this permit (and updated as appropriate);
   b. shall provide for implementation and compliance with the terms of the plan within twelve months of the effective date of this permit.

2. Upon a showing of good cause, the Director may establish a later date for preparing and compliance with a plan for a storm water discharge associated with industrial activity.

B. Signature and Plan Review.

1. The plan shall be signed in accordance with Part VI, and be retained on-site at the facility which generates the storm water discharge.

2. The permittee shall make plans available upon request to the Ohio EPA Director, or authorized representative, or Regional Administrator of U.S. EPA, or in the case of a storm water discharge associated with industrial activity which discharges through a municipal separate storm sewer system, to the operator of the municipal system.

3. The Director may notify the permittee at any time that the plan does not meet one or more of the minimum requirements of this Part. Within 30 days of such notification from the Director, the permittee shall make the required changes to the plan and shall submit to the Director a written certification that the requested changes have been made.

4. All storm water pollution prevention plans required under this permit are considered reports that shall be available to the public under Section 308(b) of the Act. The permittee may claim any portion of a storm water pollution plan as confidential in accordance with 40 CFR Part 2 and does not have to release any portion of the plan describing facility security measures (such as provided for in Part IV.D.7.b.(8) of this permit). An interested party wishing a copy of a discharger's SWP3 will have to contact the Ohio EPA to obtain a copy.

C. Keeping Plans Current.

The permittee shall amend the plan whenever there is a change in design, construction, operation, or maintenance, that has a significant effect on the potential for the discharge of pollutants to the waters of the State or if the storm water pollution prevention plan proves to be ineffective in eliminating or significantly minimizing pollutants from sources identified under Part IV.D.2 of this permit, or otherwise achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Amendments to the plan may be reviewed by Ohio EPA in the same manner as Part IV.B above.

D. Contents of Plan. The plan shall include, at a minimum, the following items:

1. Pollution Prevention Team - Each plan shall identify a specific individual or individuals within the facility organization as members of a storm water Pollution Prevention Team that are responsible for developing the storm water pollution prevention plan and assisting the facility or plant manager in its implementation, maintenance, and revision. The plan shall clearly identify the responsibilities of each team member. The activities and responsibilities of the team shall address all aspects of the facility's storm water pollution prevention plan.

2. Description of Potential Pollutant Sources. Each plan shall provide a description of potential sources which may reasonably be expected to add significant amounts of pollutants to storm water discharges or which may result in the discharge of pollutants during dry weather from separate storm sewers draining the facility. Each plan shall identify all activities and significant materials which may potentially be significant pollutant sources. Each plan shall include, at a minimum:

Part IV. STORM WATER POLLUTION PREVENTION PLANS (continued)

D. (continued)

a. Drainage.

(1) A site map indicating an outline of the drainage area of each storm water outfall, each existing structural control measure to reduce pollutants in storm water runoff, surface water bodies, locations where significant materials are exposed to precipitation, locations where major spills or leaks identified under Part IV.D.2.c of this permit have occurred, and the locations of the following activities where such activities are exposed to precipitation: fueling stations, vehicle

and equipment maintenance and/or cleaning areas, loading/unloading areas, locations used for the treatment, storage or disposal of wastes, liquid storage tanks, processing areas and storage areas.

(2) For each area of the facility that generates storm water discharges associated with industrial activity with a reasonable potential for containing significant amounts of pollutants, a prediction of the direction of flow, and an estimate of the types of pollutants which are likely to be present in storm water discharges associated with industrial activity. Flows with a significant potential for causing erosion shall be identified.

b. Inventory of Exposed Materials. An inventory of the types of materials handled at the site that potentially may be exposed to precipitation. Such inventory shall include a narrative description of significant materials that have been handled, treated, stored or disposed in a manner to allow exposure to storm water between the time of three years prior to the date of the issuance of this permit and the present; method and location of on-site storage or disposal; materials management practices employed to minimize contact of materials with storm water runoff between the time of three years prior to the date of the issuance of this permit and the present; the location and a description of existing structural and non-structural control measures to reduce pollutants in storm water runoff; and a description of any treatment the storm water receives.

c. Spills and Leaks. A list of significant spills and significant leaks of toxic or hazardous pollutants that occurred at the facility after the date of three years prior to the effective date of this permit.

d. Sampling Data. A summary of existing discharge sampling data describing pollutants in storm water discharges from the facility.

e. Risk Identification and Summary of Potential Pollutant Sources. A narrative description of the potential pollutant sources at the following areas: loading and unloading operations; outdoor storage activities; outdoor manufacturing or processing activities; significant dust or particulate generating processes; and on-site waste disposal practices. The description shall specifically list any significant potential source of pollutants at the site and for each potential source, any pollutant or pollutant parameter (e.g. biochemical oxygen demand, etc.) of concerns shall be identified.

3. Measures and Controls. Each facility covered by this permit shall develop a description of storm water management controls appropriate for the facility, and implement such controls. The appropriateness and priorities of controls in a plan shall reflect identified potential sources of pollutants at the facility. The description of storm water management controls shall address the following minimum components, including a schedule for implementing such controls:

a. Good Housekeeping - Good housekeeping requires the maintenance of a clean, orderly facility.

b. Preventive Maintenance - A preventive maintenance program shall involve inspection and maintenance of storm water management devices (e.g. cleaning oil/water separators, catch basins) as well as inspecting and testing facility equipment and systems to uncover conditions that could cause breakdowns or failures resulting in discharges of pollutants to surface waters, and ensuring appropriate maintenance of such equipment and systems.

c. Spill Prevention and Response Procedures - Areas where potential spills can occur, and their accompanying drainage points shall be identified clearly in the storm water pollution prevention plan. Where appropriate, specifying material handling procedures, storage requirements, and use of equipment such as diversion valves in the plan should be considered. Procedures for cleaning up spills shall be identified in the plan and made available to the appropriate personnel. The necessary equipment to implement a clean up should be available to personnel.

Part IV. STORM WATER POLLUTION PREVENTION PLANS (continued)

D. (continued)

d. Inspections - In addition to or as part of the comprehensive site evaluation required under Part IV.4. of this permit, qualified facility personnel shall be identified to inspect designated equipment and areas of the facility at appropriate intervals specified in the plan. A set of tracking or follow-up procedures shall be used to ensure that appropriate actions are taken in response to the inspections. Records of inspections shall be maintained.

e. Employee Training - Employee training programs shall inform personnel at all levels of responsibility of the components and goals of the storm water pollution prevention plan. Training should address topics such as spill response, good housekeeping and material management practices. The plan shall identify periodic dates for such training.

f. Recordkeeping and Internal Reporting Procedures - A description of incidents such as spills, or other discharges, along with other information describing the quality and quantity of storm water discharges shall be included in the plan required under this part. Inspections and maintenance activities shall be documented and records of such activities shall be incorporated into the plan.

g. Non-Storm Water Discharges

(1) The plan shall include a certification that the discharge has been tested or evaluated for the presence of non-storm water discharges. The certification shall include the identification of potential significant sources of non-storm water at the site, a description of the results of any test and/or evaluation for the presence of non-storm water discharges, the evaluation criteria or testing method used, the date of any testing and/or evaluation, and the on-site drainage points that were directly observed during the test. Such certification may not be feasible if the facility operating the storm water discharge associated with industrial activity does not have access to an outfall, manhole, or other point of access to the ultimate conduit which receives the discharge. In such cases, the source identification section of the storm water pollution plan shall indicate why the certification required by this part was not feasible, along with the identification of potential significant sources of non-storm water at the site. A discharger that is unable to provide the certification required by this paragraph must notify in accordance with Part IV.A of this permit.

(2) Except for flows from fire fighting activities, sources of non-storm water listed in Part VI of this permit that are combined with storm water discharges associated with industrial activity must be identified in the plan. The plan shall identify and ensure the implementation of appropriate pollution prevention measures for the non-storm water component(s) of the discharge.

h. Sediment and Erosion Control - The plan shall identify areas which, due to topography, activities, or other factors, have a high potential for significant soil erosion, and identify measures to limit erosion.

i. Management of Runoff - The plan shall contain a narrative consideration of the appropriateness of traditional storm water management practices (practices other than those which control the source of pollutants) used to divert, infiltrate, reuse, or otherwise manage storm water runoff in a manner that reduces pollutants in storm water discharges from the site. The plan shall provide that measures determined to be reasonable and appropriate shall be implemented and maintained. The potential of various sources at the facility to contribute pollutants to storm water discharges associated with industrial activity (see Parts IV.D.2.(b), (d) and (e) of this permit) shall be considered when determining reasonable and appropriate measures. Appropriate measures may include: including vegetative swales and practices, reuse of collected storm water (such as for a process or as an irrigation source), inlet controls (such as oil/water separators), snow management activities, infiltration devices, and wet detention/retention devices.

4. Comprehensive Site Compliance Evaluation. Qualified personnel shall conduct site compliance evaluations at appropriate intervals specified in the plan, but, except as provided in paragraph IV.D.4.d, in no case less than once a year. Such evaluations shall provide:

a. Material handling areas and other potential sources of pollution identified in the plan in accordance with paragraph IV.D.2 of this permit shall be visually inspected for evidence of, or the potential for, pollutants entering the drainage system. Structural storm water management measures, sediment and control measures, and other structural pollution prevention measures identified in the plan shall be observed to ensure that they are operating correctly. A visual inspection of equipment needed to implement the plan, such as spill response equipment, shall be made.

D. (continued)

b. Based on the results of the inspection, the description of potential pollutant sources identified in the plan in accordance with paragraph IV.D.2 of this permit and pollution prevention measures and controls identified in the plan in accordance with paragraph IV.D.3 of this permit shall be revised as appropriate within two weeks of such inspection and shall provide for implementation of any changes to the plan in a timely manner, but in no case more than twelve weeks after the inspection.

c. A report summarizing the scope of the inspection, personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the storm water pollution prevention plan, and actions taken in accordance with paragraph IV.D.4.b of the permit shall be made and retained as part of the storm water pollution prevention plan for at least three years. The report shall be signed in accordance with Part VI.B of this permit.

5. Additional requirements for storm water discharges associated with industrial activity through municipal separate storm sewer systems serving a population of 100,000 or more.

In addition to the applicable requirements of this permit, facilities covered by this permit must comply with applicable requirements in municipal storm water management programs developed under NPDES permits issued for the discharge of the municipal separate storm sewer system that receives the facility's discharge, provided the discharger has been notified of such conditions.

6. Consistency with other plans. Storm water pollution prevention plans may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans developed for the facility under section 311 of the Act or Best Management Practices (BMP) Programs otherwise required by a NPDES permit for the facility as long as such requirement is incorporated into the storm water pollution prevention plan.

7. Additional requirements for storm water discharges associated with industrial activity from facilities subject to SARA Title III, Section 313 requirements are not applicable to Section 313 water priority chemicals in gaseous or non-soluble liquid or solid [at atmospheric pressure and temperature] forms. In addition to the requirements of Parts IV.D.1 through 4 of this permit and other applicable conditions of this permit, storm water pollution prevention plans for facilities subject to reporting requirements under SARA Title III, Section 313 for chemicals which are classified as "Section 313 water priority chemicals" in accordance with the definition in Part VI of this permit, shall describe and ensure the implementation of practices which are necessary to provide for conformance with the following guidelines:

a. In areas where Section 313 water priority chemicals are stored, processed or otherwise handled, appropriate containment, drainage control and/or diversionary structures shall be provided. At a minimum, one of the following preventive systems or its equivalent shall be used:

(1) Curbing, culverting, gutters, sewers or other forms of drainage control to prevent or minimize the potential for storm water run-on to come into contact with significant sources of pollutants; or
(2) Roofs, covers or other forms of appropriate protection to prevent storage piles from exposure to storm water, and wind blowing.

b. In addition to the minimum standards listed under Part IV.D.7.a of this permit, the storm water pollution prevention plan shall include a complete discussion of measures taken to conform with the following applicable guidelines, other effective storm water pollution prevention procedures, and applicable State rules, regulations and guidelines:

(1) Liquid storage areas where storm water comes into contact with any equipment, tank, container, or other vessel used for Section 313 water priority chemicals.

(a) No tank or container shall be used for the storage of a Section 313 water priority chemical unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature, etc.

(b) Liquid storage areas for Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include secondary containment provided for at least the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation, a strong spill contingency and integrity testing plan, and/or other equivalent measures.

D. (continued)

(2) Material storage areas for Section 313 water priority chemicals other than liquids. Material storage areas for Section 313 water priority chemicals other than liquids which are subject to runoff, leaching, or wind blowing shall incorporate drainage or other control features which will minimize the discharge of Section 313 water priority chemicals by reducing storm water contact with Section 313 water priority chemicals.

(3) Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals. Truck and rail car loading and unloading areas for liquid Section 313 water priority chemicals shall be operated to minimize discharges of Section 313 water priority chemicals. Appropriate measures to minimize discharges of Section 313 chemicals may include: the placement and maintenance of drip pans where spillage may occur (such as hose connections, hose reels and filler nozzles) for use when making and breaking hose connections; a strong spill contingency and integrity testing plan; and/or other equivalent measures.

(4) In facility areas where Section 313 water priority chemicals are transferred, processed or otherwise handled. Processing equipment and materials handling equipment shall be operated so as to minimize discharges of Section 313 water priority chemicals. Materials used in piping and equipment shall be compatible with the substances handled. Drainage from process and materials handling areas shall be designed as described in paragraphs (a), (b) and (c) of this section. Additional protection such as covers or guards to prevent wind blowing, spraying or releases from pressure relief vents from causing a discharge of Section 313 water priority chemicals to the drainage system, and overhangs or door skirts to enclose trailer ends at truck loading/unloading docks shall be provided as appropriate. Visual inspections or leak tests shall be provided for overhead piping conveying Section 313 water priority chemicals without secondary containment.

(5) Discharges from areas covered by paragraphs (1), (2), (3) or (4).

(a) Drainage from areas covered by paragraphs (1), (2), (3) or (4) of this part should be restrained by valves or other positive means to prevent the discharge of a spill or other excessive leakage of Section 313 water priority chemicals. Where containment units are employed, such units may be emptied by pumps or ejectors; however, these shall be manually activated.

(b) Flapper-type drain valves shall not be used to drain containment areas. Valves used for the drainage of containment areas should, as far as is practical, be of manual, open-and-closed design.

(c) If facility drainage is not engineered as above, the final discharge of all in-facility storm sewers shall be equipped to be equivalent with a diversion system that could, in the event of an uncontrolled spill of Section 313 water priority chemicals, return the spilled material to the facility.

(d) Records shall be kept of the frequency and estimated volume (in gallons) of discharges from containment areas.

(6) Facility site runoff other than from areas covered by (1), (2), (3) or (4). Other areas of the facility (those not addressed in paragraphs (1), (2), (3) or (4)), from which runoff which may contain Section 313 water priority chemicals or spills of Section 313 water priority chemicals could cause a discharge shall incorporate the necessary drainage or other control features to prevent discharge of spilled or improperly disposed material and ensure the mitigation of pollutants in runoff or leachate.

D. (continued)

(7) Preventive maintenance and housekeeping. All areas of the facility shall be inspected at specific intervals for leaks or conditions that could lead to discharges of Section 313 water priority chemicals or direct contact of storm water with raw materials, intermediate materials, waste materials or products. In particular, facility piping, pumps, storage tanks and bins, pressure vessels, process and material handling equipment, and material bulk storage area shall be examined for any conditions or failures which could cause a discharge. Inspection shall include examination for leaks, wind blowing, corrosion, support or foundation failure, or other forms of deterioration or non-containment. Inspection intervals shall be specified in the plan and shall be based on design and operational experience. Different areas may require different inspection intervals. Where a leak or other condition is discovered which may result in significant releases of Section 313 water priority chemicals to the drainage system, corrective action shall be immediately taken or the unit or process shut down until corrective action can be taken. When a leak or non-containment of a Section 313 water priority chemical has occurred, contaminated soil, debris, or other material must be promptly removed and disposed in accordance with Federal, State, and local requirements and as described in the plan.

(8) Facility security. Facilities shall have the necessary security systems to prevent accidental or intentional entry which could cause a discharge. Security systems described in the plan shall address fencing, lighting, vehicular traffic control, and securing of equipment and buildings.

(9) Training. Facility employees and contractor personnel using the facility shall be trained in and informed of preventive measures at the facility. Employee training shall be conducted at intervals specified in the plan, but not less than once per year, in matters of pollution control laws and regulations, and in the storm water pollution prevention plan and the particular features of the facility and its operation which are designed to minimize discharges of Section 313 water priority chemicals. The plan shall designate a person who is accountable for spill prevention at the facility and who will set up the necessary spill emergency procedures and reporting requirements so that spills and emergency releases of Section 313 water priority chemicals can be isolated and contained before a discharge of a Section 313 water priority chemical can occur. Contractor or temporary personnel shall be informed of facility operation and design features in order to prevent discharges or spills from occurring.

8. Additional Requirements for Salt Storage. Storage piles of salt used for deicing or other commercial or industrial purposes and which generate a storm water discharge associated with industrial activity which is discharged to surface waters of the State shall be enclosed or covered to prevent exposure to precipitation, except for exposure resulting from adding or removing materials from the pile within two years of the effective date of this permit. Piles do not need to be enclosed or covered where storm water from the pile is not discharged to surface waters of the State.

Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

A. Coal Pile Runoff Effluent Limitations. Any discharge of coal pile runoff is authorized to discharge as of the effective date of this permit and shall comply with the following effluent limitations as expeditiously as practicable, but no later than three years after the effective date of this permit. Coal pile runoff shall not be diluted with storm water or other flow in order to meet these limitations.

Units	Parameter	Daily Minimum	Daily Maximum
mg/l	Total Suspended Solids	-	50
S.U.	pH	6.0	9.0

Any untreated overflow from facilities designed, constructed and operated to treat the volume of coal pile runoff which is associated with 10 year, 24-hour rainfall event shall not be subject to the limitation for Total Suspended Solids. It is the permittee's responsibility to demonstrate to the Ohio EPA that a 10-year, 24-hour rainfall event has occurred and the volume of the overflow to which the Total Suspended Solids effluent limitation does not apply.

B. Monitoring Requirements. Only the activities described in the following matrix and associated definitions are required to conduct monitoring. The monitoring required in the following matrix shall be conducted annually. Monitoring shall be initiated within twelve months of the effective date of this permit and henceforth on an annual basis, weather conditions permitting. A permittee may, in lieu of annual monitoring, certify that industrial materials are not exposed to storm water; such certification shall be submitted to the Ohio EPA upon request of the Director.

1. MONITORING REQUIREMENTS MATRIX

Reporting Units	Parameter	INDUSTRIAL ACTIVITY CATEGORIES											
		a	$b^{1,2}$	c	d	e	f	g	h	i^2	j	k	l^1
mg/l	Oil and Grease		X	X	X	X	X	X	X	X	X	X	X
mg/l	5-day Biochemical Oxygen Demand		X							X		X	
mg/l	Chemical Oxygen Demand		X	X	X	X	X		X	X			X
mg/l	Total Suspended Solids		X		X	X	X	X	X	X	X	X	X
mg/l	Total Kjeldahl Nitrogen			X								X	
mg/l	Phosphorus											X	
S.U.	pH		X	X	X	X	X	X	X	X	X	X	X
TU_a	Acute Toxicity												
Hours	Duration of Storm Event		X	X	X	X	X	X	X	X	X	X	X
Inches	Precipitation		X	X	X	X	X	X	X	X	X	X	X
Hours	Duration Between Storm Events*		X	X	X	X	X	X	X	X	X	X	X
Gallons	Volume (est)		X	X	X	X	X	X	X	X	X	X	X
mg/l	Nitrate-Nitrogen												
mg/l	Nitrite-Nitrogen												
µg/l	Lead, Total		X	X					X				
µg/l	Cadmium, Total		X^3	X									
µg/l	Copper, Total		X^3				X	X	X		X		
µg/l	Arsenic, Total		X^3	X			X						
µg/l	Chromium, Total		X^3	X			X						
mg/l	Ammonia												
µg/l	Magnesium, Total			X									

Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

B. (continued)

Reporting Units	Parameter	INDUSTRIAL ACTIVITY CATEGORIES											
		a	b[1,3]	c*	d	e	f	g	h	i[2]	j	k	l[3]
µg/l	Magnesium, Dissolved			X									
mg/l	Total Dissolved Solids			X									
mg/l	Total Organic Carbon			X									
µg/l	Barium, Total			X									
mg/l	Cyanide, Total			X									
µg/l	Mercury, Total			X									
µg/l	Selenium, Total			X									
µg/l	Silver, Total			X									
µg/l	Pentachlorophenol				X								
µg/l	Nickel, Total							X			X		
µg/l	Zinc, Total							X			X		
#/100ml	Fecal Coliform											X	

* Time between the storm event when sampling is being conducted and the last storm event producing rainfall greater than 0.1 inches.

(1) and any pollutant limited in an effluent guideline or categorical pretreatment standard which the facility is subject.

(2) and the primary ingredient used in the deicing materials used at the site (e.g., ethylene glycol, urea, etc.).

(3) Facilities that are classified as SIC 33 only because they manufacture pure silicon and/or semiconductor grade silicon are not required to monitor for this parameter.

2. Industrial Activity Categories Definitions

   a. Section 313 of SARA Title III Facilities. As of the effective date of this permit, facilities with storm water discharges associated with industrial activity that are subject to requirements to report releases into the environment under Section 313 of SARA Title III for chemicals which are classified as 'Section 313 water priority chemicals' are not (as they may have been in a previous permit) required to monitor storm water that is discharged from the facility unless required by paragraphs V.B.2.b through B.2.l.

   b. Primary Metal Industries. Facilities with storm water discharges associated with industrial activity classified as Standard Industrial Classification (SIC) 33 (Primary Metal Industry) are required to monitor such storm water that is discharged from the facility.

   c. Land Disposal Units/Incinerators/BIFs. Facilities with storm water discharges associated with industrial activity from any active or inactive landfill, land application sites or open dump without a stabilized final cover that has received any industrial wastes from a facility with a Standard Industrial Classification (SIC) of between 20-39 (manufacturing); and incinerators (including Boilers and Industrial Furnaces (BIFs)) that burn hazardous waste and operate under interim status or a permit under Subtitle C of RCRA, are required to monitor such storm water that is discharged from the facility.

   d. Wood Treatment Using Chlorophenolic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

   e. Wood Treatment Using Creosote Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

Part V. NUMERIC EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

B. (continued)

f. Wood Treatment Using Chromium-Arsenic Formulations. Facilities with storm water discharges associated with industrial activity from areas that are used for wood treatment, wood surface application or storage of treated or surface protected wood at any wood preserving or wood surface facilities are required to monitor such storm water that is discharged from the facility.

g. Coal Pile Runoff. Facilities with storm water discharges associated with industrial activity from coal pile runoff are required to monitor such storm water that is discharged from the facility.

h. Battery Reclaimers. Facilities with storm water discharges associated with industrial activity from areas used for storage of lead acid batteries, reclamation products, or waste products, and areas used for lead acid battery reclamation (including material handling activities) at facilities that reclaim lead acid batteries are required to monitor such storm water that is discharged from the facility.

i. Airports. At airports with over 50,000 flight operations per year, facilities with storm water discharges associated with industrial activity from areas where aircraft or airport deicing operations occur (including runways, taxiways, ramps, and dedicated aircraft deicing stations) are required to monitor such storm water that is discharged from the facility.

j. Coal-fired Steam Electric Facilities. Facilities with storm water discharges associated with industrial activity from coal handling sites at coal fired steam electric power generating facilities (other than discharges in whole or in part from coal piles subject to storm water effluent guidelines at 40 CFR 423 - which are not eligible for coverage under this permit) are required to monitor such storm water that is discharged from the facility.

k. Animal Handling / Meat Packing. Facilities with storm water discharges associated with industrial activity from animal handling areas, manure management (or storage) areas, and production waste management (or storage) areas that are exposed to precipitation at meat packing plants, poultry packing plants, and facilities that manufacture animal and marine fats and oils, are required to monitor such storm water that is discharged from the facility.

l. Additional Facilities. Facilities with storm water discharges associated with industrial activity that:

(1) come in contact with storage piles for solid chemicals used as raw materials that are exposed to precipitation at facilities classified as SIC 30 (Rubber and Miscellaneous Plastics Products) or SIC 28 (Chemicals and Allied Products);

(2) are from those areas at automobile junkyards with any of the following: (A) over 250 auto/truck bodies with drivelines (engine, transmission, axles, and wheels), 250 drivelines, or any combination thereof (in whole or in parts) are exposed to storm water; (B) over 500 auto/truck units (bodies with or without drivelines in whole or in parts) are stored exposed to storm water; or (C) over 100 units per year are dismantled and drainage or storage of automotive fluids occurs in areas exposed to storm water;

(3) come into contact with lime storage piles that are exposed to storm water at lime manufacturing facilities;

(4) are from oil handling sites at oil fired steam electric power generating facilities;

(5) are from cement manufacturing facilities and cement kilns (other than discharges in whole or in part from material storage piles subject to storm water effluent guidelines at 40 CFR 411 - which are not eligible for coverage under this permit);

(6) are from ready-mixed concrete facilities; or

(7) are from ship building and repairing facilities;

are required to monitor such storm water discharged from the facility.

B. (continued)

3. Sample Type. Take a minimum of one grab sample from the discharge resulting from a storm event that is greater than 0.1 inches in magnitude and that occurs at least 72 hours from the previously measurable (greater than 0.1 inch rainfall) storm event. The grab sample shall be taken during the first thirty minutes of the discharge. If the collection of a grab sample during the first thirty minutes is impracticable, a grab sample can be taken during the first hour of the discharge, and the discharger shall submit with the monitoring report a description of why a grab sample during the first thirty minutes was impracticable.

4. Sampling Waiver. When a discharger is unable to collect samples due to adverse climatic conditions, the discharger must submit in lieu of sampling data a description of why samples could not be collected, including available documentation of the event. Adverse climatic conditions which may prohibit the collection of samples includes weather conditions that create dangerous conditions for personnel (such as local flooding, high winds, hurricane, tornadoes, electrical storms, etc.) or otherwise make the collection of a sample impracticable (drought, extended frozen conditions, etc.).

5. Representative Discharge. When a facility has two or more outfalls that, based on a consideration of features and activities within the area drained by the outfall, the permittee reasonably believes discharge substantially identical effluents, the permittee may test the effluent of one of such outfalls and report that the quantitative data also applies to the substantially identical outfalls. In addition, for each outfall that the permittee believes is representative, an estimate of the size of the drainage area (in square feet) and an estimate of the runoff coefficient of the drainage area (e.g. low (under 40%), medium (40% to 65%) or high (above 65%)) shall be provided.

C. Toxicity Testing. Not Required.

D. Alternative Certification of "Not Present or No Exposure." You are not subject to the analytical monitoring requirement of this part provided: you make a certification for a given outfall, or on a pollutant-by-pollutant basis in lieu of monitoring required under this part, that material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, industrial machinery or operations, or significant materials from past industrial activity that are located in areas of the facility within the drainage area of the outfall are not presently exposed to storm water and are not expected to be exposed to storm water for the certification period; and your certification is signed in accordance with Attachment VI.G and retained in the SWP3. If you cannot certify for an entire period, you must note the date exposure was eliminated and perform any monitoring required up until that date.

Part VI. OTHER STORM WATER REQUIREMENTS, DEFINITIONS AND AUTHORIZATION

A. Failure to Certify. Any facility that is unable to provide the certification required under paragraph IV.D.3.g.(1) (testing for non-storm water discharges), must notify the Director within 180 days of the effective date of this permit. Such notification shall describe: the procedure of any test conducted for the presence of non-storm water discharges; the results of such test or other relevant observations; potential sources of non-storm water discharges to the storm sewer; and why adequate tests for such storm sewers were not feasible.

B. Signatory Requirements. See Part III.28.

C. Definitions.

"Section 313 water priority chemical" means a chemical or chemical categories which are: 1) are listed at 40 CFR 372.65 pursuant to Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986, also titled the Emergency Planning and Community Right-to-Know Act of 1986; 2) are present at or above threshold levels at a facility subject to SARA Title III, Section 313 reporting requirements; and 3) that meet at least one of the following criteria: (i) are listed in Appendix D of 40 CFR 122 on either Table II (organic priority pollutants), Table III (certain metals, cyanides, and phenols) or Table V (certain toxic pollutants and hazardous substances); (ii) are listed as a hazardous substance pursuant to section 311(b)(2)(A) of the Act at 40 CFR 116.4; or (iii) are pollutants for which EPA has published acute or chronic water quality criteria.

"Significant materials" includes, but is not limited to: raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

"Significant spills" includes, but is not limited to: releases of oil or hazardous substances in excess of reportable quantities under section 311 of the Clean Water Act (see 40 CFR 110.10 and CFR 117.21) or section 102 of CERCLA (see 40 CFR 302.4).

"Storm Water" means storm water runoff, snow melt runoff, and surface runoff and drainage.

"Definition of Storm Water Associated with Industrial Activity" means the discharge from any conveyance which is used for collecting and conveying storm water and which is directly related to manufacturing, processing or raw materials storage areas at an industrial plant. The term does not include discharges from facilities or activities excluded from the NPDES program. For the categories of industries identified in subparagraphs (i) through (x) of this subsection, the term includes, but is not limited to, storm water discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to storm water. For the categories of industries identified in subparagraph (xi), the term includes only storm water discharges from all areas listed in the previous sentence (except access roads) where material handling equipment or activities, raw materials, intermediate products, final products, waste materials, by-products, or industrial machinery are exposed to storm water. For the purposes of this paragraph, material handling activities include the: storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots as long as the drainage from the excluded areas is not mixed with storm water drained from the above described areas. Industrial facilities (including industrial facilities that are Federally or municipally owned or operated that meet the description of the facilities listed in this paragraph (i)-(xi)) include those facilities designated under 40 CFR 122.26(a)(1)(v). The following categories of facilities are considered to be engaging in "industrial activity" for purposes of this subsection:

(i) Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards under 40 CFR Subchapter N (except facilities with toxic pollutant effluent standards which are exempted under category (xi) of this paragraph);

(ii) Facilities classified as Standard Industrial Classifications 24 (except 2434), 26 (except 265 and 267), 28 (except 283 and 285) 29, 311, 32 (except 323), 33, 3441, 373;

C. (continued)

(iii) Facilities classified as Standard Industrial Classifications 10 through 14 (mineral industry) including active or inactive mining operations (except for areas of coal mining operations meeting the definition of a reclamation area under 40 CFR 434.11(l)) and oil and gas exploration, production, processing, or treatment operations, or transmission facilities that discharge storm water contaminated by contact with or that has come into contact with, any overburden, raw material, intermediate products, finished products, byproducts or waste products located on the site of such operations; inactive mining operations are mining sites that are not being actively mined, but which have an identifiable owner/operator;

(iv) Hazardous waste treatment, storage, or disposal facilities, including those that are operating under interim status or a permit under Subtitle C of RCRA;

(v) Landfills, land application sites, and open dumps that have received any industrial wastes (waste that is received from any of the facilities described under this subsection) including those that are subject to regulation under Subtitle D of RCRA;

(vi) Facilities involved in the recycling of materials, including metal scrapyards, battery reclaimers, salvage yards, and automobile junkyards, including but not limited to those classified as Standard Industrial Classification 5015 and 5093;

(vii) Steam electric power generating facilities, including coal handling sites;

(viii) Transportation facilities classified as Standard Industrial Classifications 40, 41, 42 (except 4221-25), 43, 44, 45, and 5171 which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations. Only those portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified under paragraphs (i)-(vii) or (ix)-(xi) of this subsection are associated with industrial activity;

(ix) Treatment works treating domestic sewage or any other sewage sludge or wastewater treatment device or system, used in the storage treatment, recycling, and reclamation of municipal or domestic sewage, including land dedicated to the disposal of sewage sludge that are located within the confines of the facility, with a design flow of 1.0 mgd or more, or required to have an approved pretreatment program under 40 CFR 403. Not included are farm lands, domestic gardens or lands used for sludge management where sludge is beneficially reused and which are not physically located in the confines of the facility, or areas that are in compliance with 40 CFR 503;

(x) Construction activity - This category of industrial activity is not regulated under this permit.

(xi) Facilities under Standard Industrial Classifications 20, 21, 22, 23, 2434, 25, 265, 267, 27, 283, 285, 30, 31 (except 311), 34 (except 3441), 35, 36, 37 (except 373), 38, 39, 4221-25, (and which are not otherwise included within categories (ii)-(x)).

"SWPPP" means storm water pollution prevention plan to be completed as a condition of this permit (see Part IV of this permit).

"Time-weighted composite" means a composite sample consisting of a mixture of equal volume aliquots collected at a constant time interval.

"Waste pile" means any non-containerized accumulation of solid, non-flowing waste that is used for treatment or storage.

"10-year, 24-hour precipitation event" means the maximum 24-hour precipitation event with a probable reoccurrence interval of once in 10 years. This information is available in "Weather Bureau Technical Paper No. 40,", May 1961 and "NOAA Atlas 2," 1973 for the 11 Western States, and may be obtained from the National Climatic Center of the Environmental Data Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

"Bypass" means the intentional diversion of waste streams from any portion of the treatment facility.

"Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Comprehensive Compliance Monitoring and Enforcement Report

Report run on: November 18, 2008 - 10:27 AM | Version: 3.0

User Selection Criteria

Location:	Ohio, all activities	**Activity Location:**	None Chosen
Handler ID:	OHD004251070	**Group of IDs:**	None Chosen
Handler Name:			
Handler Universe:	No Additional Restrictions		
Evaluation Date Range:	From Date: 10/01/1990 To Date: 11/18/2008	**Extract Flag:**	Include All Sites
Location County Code:		**Evaluation Suborganization:**	
Location City:		**Evaluation Person:**	
Location Zip Code:		**Evaluation Focus Area:**	
State District:		**Federal Facilities:**	No, Show All
		Only Eval's with Viol's:	No, All Evaluations
Evaluating Agencies:	None Chosen		
Evaluation Types:	None Chosen		
Violation Types:	None Chosen		
Sort Order:	Region, State, Handler Name		
Display Code Descrip.:	Yes		

Results

Data meeting the criteria you selected follows.

Total Pages: 6 Handler Count: 1

Report Description

This report provides a complete listing of evaluation, violation and enforcement activities for each Handler, including all orphan records. Below the Handler ID information, the data is presented in three sections; evaluations, violations and enforcements. Comments, referred to as Notes, are provided in each respective section. Since evaluations are included regardless of whether or not violations are identified, this report also serves as a useful management tool for tracking progress made towards meeting RECAP commitments.

Report Information

Name:	cmecomp.rdf
Developed by:	EPA Headquarters, Office of Enforcement and Compliance Assurance
Deployed Date:	November 2005
Last Updated:	April 2006
Contact:	rcrainfo.help@epa.gov
Tables Used:	cmecomp3, hreport_univ3, ccitation3, hhandler2, lu_state, hid_groups
Libraries:	none

Comprehensive Compliance Monitoring and Enforcement Report

Report run on: November 18, 2008 - 10:27 AM

This report may contain enforcement sensitive data.

SENCO PRODUCTS INC County Name / Code: HAMILTON / OH061 **OHD004251070**

Location: 8485 BROADWELL ROAD; CINCINNATI, OH 45244 **REGION 05**

Mailing: 8485 BROADWELL ROAD; CINCINNATI, OH 45244

Activity Location: OH State District: SW Accessibility: Non-Notifier: Extract Flag: Y Active Site: Y

Generator: LQG Transporter: N Operating TSDF: ----- IC In Place: N EI Indicator (HE / GW): N / N
Full Enforcement: ---- Converter: ---- State Unaddressed SNC: N EPA Unaddressed SNC: N
CA Wrkld: N State TSDF: ------- State Addressed SNC: N EPA Addressed SNC: N
Active State Gen: N State SNC w/Comp Sched: N EPA SNC w/Comp Sched N

CEI Evaluation 02/25/2003 Activity Location: OH By: STATE Identifier: 005 Person: SROT Suborganization: SW Found Violation: NO
Citizen Complaint: NO Multimedia Inspection: NO Sampling: NO Not Subtitle C: NO Day Zero: Focus Area:
Eval. Notes: NO VIOLATIONS CITED, NOC SINCE 3/19/03

No Linked Violations

FCI Evaluation 10/05/1992 Activity Location: OH By: STATE Identifier: 004 Person: OHMM Suborganization: SW Found Violation: NO
Citizen Complaint: YES Multimedia Inspection: NO Sampling: NO Not Subtitle C: NO Day Zero: Focus Area: V3
Eval. Notes: CI - NO VIOLATIONS CITED, MUST PROVIDE DOCUMENTATION AS TO THE MANAGEMENT MTHOD CHOSEN TO HANDLE WASTE PAINT AND SOLVENT

No Linked Violations

CEI Evaluation 01/27/1992 Activity Location: OH By: STATE Identifier: 003 Person: OHHO Suborganization: SW Found Violation: YES
Citizen Complaint: NO Multimedia Inspection: NO Sampling: NO Not Subtitle C: NO Day Zero: Focus Area:
Eval. Notes: VIOLATIONS

Violation: Activity Location: OH Type: 262.C Determined Date: 01/27/1992 Determined by Agency: STATE Responsible Agency: STATE
Scheduled Compliance Date: 03/28/1992 Actual Compliance Date: 05/28/1992 RTC Qualifier: OBSERVED Sequence Number: 3
Former Citation - SR - 3745-52-34
Viol. Notes: CONTAINER EXCEEDED THE II90 DAY STORAGE

Enforcement: Activity Location: OH Type: 120 Action Date: 03/13/1992 Identifier: 003
Docket: Agency: STATE Responsible Person: OHHO Branch: SW
CA Component: N Disposition Status: Appeal Initiated: Appeal Resolved:

Violation: Activity Location: OH Type: 262.C Determined Date: 01/27/1992 Determined by Agency: STATE Responsible Agency: STATE
Scheduled Compliance Date: 03/28/1992 Actual Compliance Date: 09/03/1992 RTC Qualifier: OBSERVED Sequence Number: 4
Former Citation - SR - 3745-52-34(C)(1)(b)
Viol. Notes: FAILURE TO MARK CONTAINERS WITH THE WORDS HAZARDOUS WASTE

Enforcement: Activity Location: OH Type: 120 Action Date: 05/28/1992 Identifier: 004
Docket: Agency: STATE Responsible Person: OHHO Branch: SW
CA Component: N Disposition Status: Appeal Initiated: Appeal Resolved:

Enforcement: Activity Location: OH Type: 120 Action Date: 03/13/1992 Identifier: 003
Docket: Agency: STATE Responsible Person: OHHO Branch: SW
CA Component: N Disposition Status: Appeal Initiated: Appeal Resolved:

Report run on: November 18, 2008 - 10:27 AM

This report may contain enforcement sensitive data.

Total Number of Handlers: 1

Total Number of Activity Locations: 1

* End of Report *

Report run on: November 18, 2008 - 10:27 AM

This report may contain enforcement sensitive data.

Description of codes used on the report:

Universes	Description of Universes
Generator	Indicates that the facility is a Large Quantity Generator (LQG), Small Quantity Generator (SQG), Conditionally Exempt Small Quantity Generator (CEG), or not a generator (N).
Transporter	Indicates that the facility Transports waste subject to RCRA regulations. ('Y' indicates that the facility is in this universe).
Operating TSDF	Indicates that the facility is a Treatment, Storage or Disposal facility subject to any type of enforcement. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
IC in Place	Indicates that the facility has Institutional Controls in place. ('Y' indicates that the facility is in this universe).
EI Indicator (HE / GW)	Indicates that the facility has controls in place for Environmental Indicators. HE - Human Exposures ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist) GW - Groundwater Release ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist)
Full Enforcement	Indicates that the facility is a Treatment, Storage or Disposal facility which is part of the Full Enforcement universe. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
CA Workload	Indicates that the facility is part of the Corrective Action Workload universe. ('Y' indicates that the facility is in this universe).
Active State Gen	Indicates that the facility is an Active State Generator. ('Y' indicates that the facility is in this universe).
Converter	Indicates that the facility is a Converter Treatment, Storage or Disposal facility. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
State TSDF	Indicates that the facility is a State Treatment, Storage or Disposal facility. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
State Unaddressed SNC	Indicates that the facility is a State Unaddressed Significant Non-Complier. ('Y' indicates that the facility is in this universe).
State Addressed SNC	Indicates that the facility is a State Addressed Significant Non-Complier. ('Y' indicates that the facility is in this universe).
State SNC w/ Compl. Sched	Indicates that the facility is a State Significant Non-Complier with a Compliance Schedule. ('Y' indicates that the facility is in this universe).
EPA Unaddressed SNC	Indicates that the facility is an EPA Unaddressed Significant Non-Complier. ('Y' indicates that the facility is in this universe).
EPA Addressed SNC	Indicates that the facility is an EPA Addressed Significant Non-Complier. ('Y' indicates that the facility is in this universe).
EPA SNC w/ Compl. Sched	Indicates that the facility is a EPA Significant Non-Complier with a Compliance Schedule. ('Y' indicates that the facility is in this universe).

This report may contain enforcement sensitive data.

Description of codes used on the report:

ACCESSIBILITY - indicates the reason why the handler is not accessible for normal RCRA tracking and processing (previously called Bankrupt Indicator):

Code	Description
B	indicates that the handler has filed for bankruptcy and bankruptcy litigation is in process.
C	indicates that all RCRA responsibilities for permitting/closure, corrective action, and compliance monitoring and enforcement at the facility have been formally transferred to the CERCLA program or state equivalent.
F	indicates that all responsible parties (owners/operators) for the handler have fled the country or are otherwise not available for prosecution.
L	indicates that the handler's case is tied up in litigation to the extent that further progress in achieving RCRA compliance through normal enforcement is not possible.

NON-NOTIFIER - indicates that the handler has been identified through a source other than Notification and is suspected of conducting RCRA-regulated activities without proper authority:

Code	Description
E	indicates that the handler was initially a non-notifier, subsequently determined to be exempt from requirements to notify.
O	indicates that the handler is a former non-notifier
X	indicates that the handler is a non-notifier

BY

By indicates the agency who performed the evaluation/inspection.

FOUND VIOLATION - indicates whether or not the evaluation discovered a violation.

Code	Description
Yes	indicates that the evaluation did find violations.
No	indicates that the evaluation did not find violations.
U	indicates that it is undetermined at this time. The agency may still be determining whether violations existed.

Evaluation Type	Description
CEI	COMPLIANCE EVALUATION INSPECTION ON-SITE
FCI	FOCUSED COMPLIANCE INSPECTION

Focus Area	Description
V3	CONVERTED FROM V2 RCRAINFO

This report may contain enforcement sensitive data.

Description of codes used on the report:

Violation Type	Description
262.C	GENERATORS - PRE-TRANSPORT

Enforcement Type	Description
120	WRITTEN INFORMAL

RCRA Site Detail

Report run on: November 18, 2008 - 10:32 AM

Version 3.0

User Selection Criteria

Handler EPA ID:	OHD004251070
Activity Location:	OHIO
History:	All records
WAR Cycles:	Show all

Results

Data meeting the criteria you selected follows.
Total Pages: 6

Report Description

The RCRA Site Detail report provides "all available details" from the handler module and summarized information from the waste activity monitoring module for one RCRA site. The report integrates National Biennial RCRA Hazardous Waste Report data with Site Identification data.

Details reported about the RCRA site include basic handler module information; the standard suite of universes; information about each source record received for the facility, including basic information, location and mailing address, source record and permit contact person (including historical records), list of NAICS codes, complete list of regulated waste activities; and summarized National Biennial RCRA Hazardous Waste Report information by reporting cycle year, including quantity totals (generated, managed, shipped, received), and top ten GM forms by quantity generated. Top ten GM form list shows reported waste description, quantities, onsite and offsite system types, and EPA and State waste codes.

Information listed for the RCRA site can be limited by activity location, latest historical information, and most recent BR cycle.

Data is sorted by Activity Location, most recent Received Date, and highest sequence number, with the exception that the activity location matching the site's location state is sorted to the top.

Report Information

Name:	sitedetail.rdf
Developed by:	EPA Headquarters, Office of Solid Waste
Deployed:	November 2002
Last Revised:	June 2007
Contact:	rcrainfo.help@epa.gov
Tables Used:	hbasic, hreport_univ3, hprevious_id, hhandler2, lu_country, howner_operator2, hnaics, lu_naics, hstate_activity, hother_permit2, huniversal_waste, lu_universal_waste, hwaste_code, bgm_basic, bgm_onsite_treatment, bgm_offsite_shipment, bwr_basic, bwr_waste_code, lu_management_method, gpra_ca, aevent, aln_area_event, aarea, lu_state, hid_groups
Libraries:	decodes.pll

NOTE: Some data is suppressed if it is null or blank. See documentation in RCRAInfo Help for details.

List of Hazardous Waste Code Descriptions

Please run the lookup table report for LU_WASTE_CODES for description of federal and state waste codes in this report.

List of Handler Universe Abbreviations

Generator	Indicates that the facility is a Large Quantity Generator (LQG), Small Quantity Generator (SQG), Conditionally Exempt Small Quantity Generator (CEG), or not a generator (N).
Transporter	Indicates that the facility Transports waste subject to RCRA regulations. ('Y' indicates that the facility is in this universe).
Operating TSDF	Indicates that the facility is a Treatment, Storage or Disposal facility subject to any type of enforcement. It then specifies the type of facility (L - Land Disposal; I - Incinerator; B - BIF; S - Storage; T - Treatment)
IC in Place	Indicates that the facility has Institutional Controls in place. ('Y' indicates that the facility is in this universe).
EI Indicator (HE/GW)	Indicates that the facility has controls in place for Environmental Indicators. HE - Human Exposures ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist) GW - Groundwater Release ('+' indicates the exposure exists and is under control; '-' indicates the exposure exists and is not under control; 'N' indicates the exposure does not exist)

RCRA Site Detail

OHD004251070 SENCO PRODUCTS INC

EPA Region 05 **Extract Flag:** Y **Facility Identifier:** **County:** HAMILTON

Universes

Generator:	LQG	Transporter:	N	Active:	Y
Operating TSDF:	----	IC In Place:	N	EI Indicator (HE / GW):	/

Activity Location: OH **Source Type:** Other - B **Seq. Number:** 2 **Receive Date:** 27 FEB 2006 **Report Cycle:** 2005

Other/Previous Site Name: SENCO PRODUCTS INC

Location Address: 8485 BROADWELL ROAD, CINCINNATI, OH 45244

Mailing Address: 8485 BROADWELL ROAD, CINCINNATI, OH 45244, UNITED STATES

Contact Person For Source Information ROBERT J. SCHMIDT (513) 388-2998 UNITED STATES

Owner (current)
SENCO PRODUCTS INC
From: 06/06/1965 To:
8485 BROADWELL RD
CINCINNATI, OH 45244
CINCINNATI
Type: Private
Phone:

Operator (current)
SENCO PRODUCTS INC
From: 06/06/1965 To:
8485 BROADWELL ROAD
CINCINNATI, OH 45244
CINCINNATI
Type: Private
Phone:

Land Type: Private Non Notifier: No Commercial Availability: Unknown Tsd Date:

Accessibility: No. Employees: State District: SW

NAICS Codes: 333991 Power-Driven Handtool Manufacturing

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State: OH-1 Large Quantity Generator

Transfer Facility:

Other Hazardous Waste Generator Activities

Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
TSD Activity:	No
Recycler Activity:	No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption:	No
Smelting, melting, Refining Furnace Exemption:	No

Used Oil Activities

Used Oil Transporter Activity

Transporter:	No
Transfer Facility:	No

Used Oil Processor and/or Re-refiner Activity

Processor:	No
Refiner:	No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner:	No
Marketer who first claims the used oil meets the specifications:	No

Underground Injection Control: No

Destination Facility for Universal Waste: No

Universal Waste Activities: Description	**Generated**	**Accumulated/ Managed**
Batteries	N	N
Lamps	N	N
Pesticides	N	N
Mercury containing equipment	N	N

Description of Hazardous Wastes (as reported on Site Identification Form)
EPA Waste Codes: D001, D002, D003, D010, U181

Biennial Report Information

No Biennial Report detail information available.

Activity Location: OH **Source Type:** Biennial Report **Seq. Number:** 1 **Receive Date:** 28 FEB 2005 **Report Cycle:** 2004

Other/Previous Site Name: SENCO PRODUCTS INC

Location Address: 8485 BROADWELL RD, CINCINNATI, OH 45244

Mailing Address: 8485 BROADWELL RD, CINCINNATI, OH 45244, UNITED STATES

Contact Person For Source Information ROBERT J. SCHMIDT (513) 388-2998 bschmidt@senco.com UNITED STATES

OHD004251070 SENCO PRODUCTS INC

Continued...

Owner (current)
SENCO PRODUCTS INC
From: 06/06/1965 To:

8485 BROADWELL RD
CINCINNATI, OH 45244
CINCINNATI

Type: Private
Phone:

Operator (current)
SENCO PRODUCTS INC
From: 06/06/1965 To:

8485 BROADWELL RD
CINCINNATI, OH 45244
CINCINNATI

Type: Private
Phone:

Land Type: Private | Non Notifier: No | Commercial Availability: Unknown | Tsd Date:
Accessibility: | No. Employees: | State District: SW

NAICS Codes: 333991 Power-Driven Handtool Manufacturing

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State: OH-1 Large Quantity Generator

Transfer Facility:

Other Hazardous Waste Generator Activities

Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
TSD Activity:	No
Recycler Activity:	No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption:	No
Smelting, melting, Refining Furnace Exemption:	No

Used Oil Activities

Used Oil Transporter Activity

Transporter:	No
Transfer Facility:	No

Used Oil Processor and/or Re-refiner Activity

Processor:	No
Refiner:	No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner:	No
Marketer who first claims the used oil meets the specifications:	No

Underground Injection Control: No

Destination Facility for Universal Waste: No

Universal Waste Activities:

Description	**Generated**	**Accumulated/ Managed**
Batteries	N	N
Lamps	N	N
Pesticides	N	N
Mercury containing equipment	N	N

Biennial Report Information

Total Quantity Reported (Tons): Generated: 0 Managed: 0 Shipped: 0 Received: 0

Top 10 GM Forms Summary by Largest Quantity of Hazardous Waste Generated (All quantities are in tons)

Generated	Managed	Onsite Management Methods	Shipped	Offsite Management Methods

Activity Location: OH Source Type: Other - B Seq. Number: 1 Receive Date: 27-FEB-2004 Report Cycle: 2003

Other/Previous Site Name: SENCO PRODUCTS INC

Location Address: 8485 BROADWELL RD
CINCINNATI, OH 45144

Mailing Address: 8485 BROADWELL RD
CINCINNATI, OH 45144
UNITED STATES

Contact Person For Source Information
ROBERT J. SCHMIDT
(513) 388-2998
bschmidt@senco.com
UNITED STATES

Owner (current)
SENCO PRODUCTS INC
From: 06/06/1965 To:

8485 BROADWELL RD
CINCINNATI, OH 45244
CINCINNATI

Type: Private
Phone:

Operator (current)
SENCO PRODUCTS INC
From: 06/06/1965 To:

8485 BROADWELL RD
CINCINNATI, OH 45244
CINCINNATI

Type: Private
Phone:

Land Type: Private | Non Notifier: No | Commercial Availability: Unknown | Tsd Date:
Accessibility: | No. Employees: | State District: SW

RCRA Site Detail

OHD004251070 SENCO PRODUCTS INC

Continued...

NAICS Codes: 333991 Power-Driven Handtool Manufacturing

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Large Quantity Generator; State: OH-1 Large Quantity Generator

Transfer Facility:

Other Hazardous Waste Generator Activities

Importer Activity:	No
Mixed Waste Generator:	No
Transporter Activity:	No
TSD Activity:	No
Recycler Activity:	No

Exempt Boiler and/or Industrial Furnace

Small Quantity Onsite Burner Exemption:	No
Smelting, melting, Refining Furnace Exemption:	No

Used Oil Activities

Used Oil Transporter Activity

Transporter:	No
Transfer Facility:	No

Used Oil Processor and/or Re-refiner Activity

Processor:	No
Refiner:	No

Off-Specification Used Oil Burner: No

Used Oil Fuel Marketer Activity

Marketer who directs shipment off-specification used oil to off-specification used oil burner:	No
Marketer who first claims the used oil meets the specifications:	No

Underground Injection Control: No

Destination Facility for Universal Waste: No

Universal Waste Activities: Description	Generated	Accumulated/ Managed
Batteries	N	N
Lamps	N	N
Pesticides	N	N
Mercury containing equipment	N	N

Description of Hazardous Wastes (as reported on Site Identification Form)

EPA Waste Codes: D001, D002, D003, D010, U181

Biennial Report Information

No Biennial Report detail information available.

Activity Location: OH Source Type: Notification Seq. Number: 1 Receive Date: 25JAN1993

Other/Previous Site Name: SENCO PRODUCTS INC

Location Address: 8485 BROADWELL RD
SITE A
CINCINNATI, OH 45244

Mailing Address: 8485 BROADWELL RD
CINCINNATI, OH 45244

Contact Person For Source Information: ROBERT J SCHMIDT, (513) 388-2998, 8485 BROADWELL RD, CINCINNATI, OH 45244

Owner (current)

SENCO PRODUCTS INC
From: To:

8485 BROADWELL RD
CINCINNATI, OH 45244

Type: Private
Phone: (513) 388-2998

Land Type: Bad code -	Non Notifier:	No	Commercial Availability:	Other - U	Tsd Date:	
Accessibility:	No. Employees:		State District:	SW		

OHD004251070 SENCO PRODUCTS INC

Continued...

Regulated Waste Activities

Hazardous Waste Generator Status - Federal: Conditionally Exempt SQG State:

Transfer Facility:	Unknown
Other Hazardous Waste Generator Activities	
Importer Activity:	Unknown
Mixed Waste Generator:	Unknown
Transporter Activity:	No
TSD Activity:	No
Recycler Activity:	No
Exempt Boiler and/or Industrial Furnace	
Small Quantity Onsite Burner Exemption:	Unknown
Smelting, melting, Refining Furnace Exemption:	Unknown

Used Oil Activities

Used Oil Transporter Activity	
Transporter:	No
Transfer Facility:	No
Used Oil Processor and/or Re-refiner Activity	
Processor:	No
Refiner:	No
Off-Specification Used Oil Burner:	No
Used Oil Fuel Marketer Activity	
Marketer who directs shipment off-specification used oil to off-specification used oil burner:	No
Marketer who first claims the used oil meets the specifications:	No
Underground Injection Control:	No
Destination Facility for Universal Waste:	

Description of Hazardous Wastes (as reported on Site Identification Form)

EPA Waste Codes: D001, D002, F001, F002, F003, F005, U002, U159, U210, U220, U239

* End of Report *

Appendix IV

Ecological Risk Assessment Report

Appendix IV

Ecological Risk Assessment Report

Prepared for:
TRC Environmental
Cincinnati, Ohio

On Behalf of:
Bway Corporation
Cincinnati, Ohio

Prepared By:
Ramboll Environ US Corporation
Cleveland, Ohio

Date
March 2016

Project Number
02-20860B

ECOLOGICAL RISK ASSESSMENT

REVISED MARCH 2016

RAMBOLL ENVIRON

CONTENTS

1.	**INTRODUCTION**	**1**
2.	**SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT**	**3**
2.1	Screening Level Problem Formulation	3
2.1.1	Operational History	4
2.1.2	Ecological Setting	4
2.1.3	Detected Constituents	7
2.1.4	Potential Ecological Receptors	8
2.1.5	Potentially Complete Exposure Pathways	10
2.1.6	Assessment and Measurement Endpoints	11
2.1.7	Conceptual Site Model	13
2.2	Screening Level Exposure Assessment	13
2.3	Screening Level Effects Characterization	13
2.4	Screening Level Risk Characterization	14
3.	**BASELINE ECOLOGICAL RISK ASSESSMENT: STEP 3A**	**18**
3.1	Refinement of Identified Preliminary COPECs	18
3.1.1	SWMU 22 – Process Pond	20
3.1.2	SWMU 23 – Land Application Treatment Area/Sprayfield	23
3.1.3	AOI B – Former Process Wastewater Sewer	25
3.1.4	AOI C – Historical Debris Area	27
3.2	Refined Assessment and Measurement Endpoints	30
3.2.1	Benthic Invertebrate Community Structure and Function	31
3.2.2	Fish Community Structure and Function	31
3.2.3	Survival and Reproduction of Bird and Mammal Populations	31
3.3	Refined Exposure Estimates	32
3.3.1	Benthic Invertebrates	33
3.3.2	Fish	34
3.3.3	Wildlife	34
3.4	Refined Effects Characterization	36
3.4.1	Benthic Invertebrates	36
3.4.2	Fish	38
3.4.3	Wildlife	38
3.5	Refined Risk Calculations	40
3.5.1	Benthic Invertebrates	40
3.5.2	Fish	40
3.5.3	Wildlife	40
3.6	Uncertainty Analysis	41
4.	**CONCLUSIONS AND RECOMMENDATIONS**	**42**
5.	**REFERENCES**	**44**

TABLES

Table 1:	Conceptual Site Model for Ecological Exposures
Table 2:	Surface Water Ecological Screening
Table 3a:	Sediment Ecological Screening
Table 3b:	Refined Sediment Screening Evaluation
Table 4:	Sediment Porewater Ecological Screening
Table 5a:	Surface Soil Ecological Screening
Table 5b:	Surface Soil Background Comparison
Table 5c:	Refined Surface Soil Screening Evaluation
Table 6:	Sediment Quality Benchmark Determination for Selected Volatile Organic Compounds
Table 7:	Exposure Point Concentrations for Wildlife Receptors
Table 8:	Calculation of Food Ingestion Rates for Wildlife Receptors
Table 9:	Calculation of Total Daily Intakes for Wildlife Receptors in SWMU 22
Table 10:	Calculation of Total Daily Intakes for Wildlife Receptors in AOI B
Table 11:	Calculation of Total Daily Intakes for Wildlife Receptors in AOI C
Table 12:	Estimate of Risk for Wildlife Receptors (NOAEL)
Table 13:	Estimate of Risk for Wildlife Receptors (LOAEL)
Table 14:	Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Sediment
Table 15:	Evaluation of Simultaneously Extracted Metals (SEM) and Acid Volatile Sulfide (AVS) in Sediment
Table 16:	Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Surface Water
Table 17:	Effects of Uncertainty in Ecological Risk Assessment

FIGURES

Figure 1:	Site Vicinity Map
Figure 2:	USEPA Expanded Eight-Step Ecological Risk Assessment Process and Comparison with Approximate Ohio EPA Process
Figure 3:	Site Layout
Figure 4:	National Wetlands Inventory Map
Figure 5	Surface Water Field Measured Parameters and Pond Transect Data
Figure 6:	RFI Sampling Locations and Groundwater Contours

ATTACHMENTS

Attachment 1:	Photographic Log
Attachment 2:	Threatened and Endangered Species Correspondence

ACRONYMS AND ABBREVIATIONS

AOI:	Area of Interest
AUF:	area use factor
AVS:	acid volatile sulfide
BAFs:	bioaccumulation factors
BEHP:	bis(2-ethylhexyl)phthalate
BERA:	baseline ecological risk assessment
BW:	body weight
Bway:	Bway Corporation
CCR:	Current Conditions Report
CEC:	Civil and Environmental Consultants, Inc
Ci:	dietary concentration
CR(III):	trivalent chromium
CR(VI):	hexavalent chromium
COD:	chemical oxygen demand
COPECs:	constituents of potential ecological concern
CSM:	conceptual site model
D&I:	drawn and iron
EC20:	concentration affecting 20 percent of the population
Eco-SSLs:	ecological soil screening levels
EFs:	extrapolation factors
ENVIRON:	ENVIRON International Corporation
EPCs:	exposure point concentrations
ERA:	ecological risk assessment
ESL:	Ecological Screening Level
FCV:	final chronic value
FIR:	food ingestion rate
foc:	sediment-specific fraction organic carbon
FMR:	free metabolic rate
g/kg-day:	grams per kilogram body weight per day
HPAHs:	high molecular weight PAHs
HQ:	hazard quotient

Kcal/g:	kilocalorie per gram
Kcal/kg-day:	kilocalorie per kilogram bodyweight per day
kg:	kilogram
kg/day:	kilogram per day
Koc:	chemical-specific organic carbon-water partition coefficient
Kow:	octanol-water partitioning coefficient
KOWWIN:	Log Octanol-Water Partitioning Coefficient Program
LOAEL:	lowest observed adverse effect level
LPAHs:	low molecular weight PAHs
MDEQ:	Michigan Department of Environmental Quality
mg/kg:	milligram per kilogram
mg/kg-day:	milligram per kilogram body weight per day
mg/L:	milligram per liter
mm:	millimeters
NOAEL:	no observed adverse effect level
NPDES:	National Pollutant Discharge Elimination System
NWI:	National Wetlands Inventory
OC:	organic carbon
ODNR:	Ohio Department of Natural Resources
Ohio EPA:	Ohio Environmental Protection Agency
OMZA:	outside mixing zone average
ORNL:	Oak Ridge National Laboratory
PAHs:	polycyclic aromatic hydrocarbons
PEC:	probably effects concentration
PEMFx:	palustrine, emergent, semi-permanently flooded, excavated
PRG:	preliminary remediation goal
PTI:	permit-to-install
PUBFx:	palustrine, unconsolidated bottom, semi-permanently flooded, excavated
PUBGx:	palustrine, unconsolidated bottom, intermittently exposed, excavated
Ramboll Environ:	Ramboll Environ US Corporation, formerly ENVIRON
RCRA:	Resource Conservation and Recovery Act
ROIs:	receptors of interest
SEM:	simultaneously extracted metals

SIR:	sediment/soil ingestion rate
SLERA:	screening level ecological risk assessment
SMDP:	scientific management decision point
SQB:	sediment quality benchmark
SRAS:	slow rate spray application system
SRV:	sediment reference value
SVOCs:	semi-volatile organic compounds
SWMU:	Solid Waste Management Unit
TCE:	trichloroethylene
TDI:	total daily intake
TOC:	total organic carbon
TRVs:	toxicity reference values
TU:	toxic unit
UFs:	uncertainty factors
µg/gOM:	micrograms per gram of organic matter
µg/L:	microgram per liter
µmol/gOC:	micromoles per gram organic carbon
USEPA:	United States Environmental Protection Agency
USFWS:	United States Fish and Wildlife Service
VOCs:	volatile organic compounds
WQB:	water quality benchmark

1. INTRODUCTION

In collaboration with TRC Environmental (formerly the Payne Firm), Ramboll Environ US Corporation (Ramboll Environ, formerly ENVIRON International Corporation [ENVIRON]) prepared this revised ecological risk assessment (ERA) for the Bway Corporation (Bway) metal container manufacturing facility located at 8200 Broadwell Road in Cincinnati, Ohio (the Facility). The location of the Facility is shown on Figure 1. This ERA was prepared as a component of the Resource Conservation and Recovery Act (RCRA) corrective action for the facility implemented by Bway under the September 13, 2007 Administrative Order of Consent (Order) between the United States Environmental Protection Agency (USEPA) and Bway. This ERA has been revised based on comments received from the USEPA on April 2, 2014, and a conference call with the USEPA on October 29, 2015.

The objective of this ERA is to evaluate the likelihood that adverse ecological effects could result from exposure to environmental stressors associated with conditions at the Bway facility. USEPA's ERA process (1992, 1997, 1998, 2000a, 2001) was used for this evaluation; USEPA's process involves a screening level ERA (SLERA; Steps 1 and 2) and a baseline ERA (BERA; Steps 3 through 8), as reflected in Figure 2 (USEPA 1997, 2000a). According to USEPA (2000a):

> "The Problem Formulation [i.e., Step 3] is commonly thought of in two parts: Step 3a and Step 3b. Step 3a serves to introduce information to refine the risk estimates from steps one and two. For the majority of Sites, ecological risk assessment activities will cease after completion of Step 3a. At many Sites, a single deliverable document consisting of the reporting of results from Steps 1, 2 and 3a may be submitted. At those Sites with greater ecological concerns, the additional problem formulation is called Step 3b. It is very important at this stage to perform a 'reality check.' Sites that do not warrant further study should not be carried forward."

Step 3a of the ERA process is an opportunity for iterative refinement of potential risks using methods similar to those used in Steps 1 and 2 (USEPA 2000a, 2001). Specifically, constituents identified in the SLERA may be eliminated from further consideration based on the refinement of certain assumptions, such as reasonable chemical exposure estimates and consideration of more realistic bioavailability or ecotoxicity potential. While Step 2 is followed by an initial scientific management decision point (SMDP), Step 3a is followed by a final SMDP that involves the reporting of results to stakeholders.

This revised ERA for Bway includes Steps 1 though 3a, along with SMDPs (Figure 2). Three major elements are included in an ERA: problem formulation, analysis of exposure and ecological effects, and risk calculation. Progression from the SLERA to the BERA (Step 3a) involves iterative consideration and refinement of these major elements, as necessary.

The *screening-level problem formulation phase* of the ERA integrates available information to provide the basis for both generating a preliminary conceptual model of the site and developing initial assessment endpoints. The conceptual model identifies stressor sources and characteristics, the elements of the ecosystem that are potentially at risk from site conditions, and relationships between ecological entities and stressors. Assessment endpoints are explicit expressions of the environmental values that are to be protected, and thus are the focus of the analysis and risk characterization phases of the risk assessment. The problem formulation for the Bway ERA will serve as the foundation for a screening level analysis and will be based on available data and information. Consistent with USEPA (1998) guidance, problem formulation also includes the development of an analysis plan to evaluate relationships between ecological entities and stressors and assessment endpoints in terms of measures of effect, exposure, and/or ecosystem and receptor characteristics.

The *analysis phase* of the ERA involves the characterization of relationships between exposures and effects. This characterization involves identification of appropriate exposure estimates for the assessment and measurement endpoints identified in the problem formulation. Characterization will also involve the identification of appropriate estimates of potential adverse impacts or ecological effects for the constituents. The uncertainties associated with the analysis of effects and exposures will also be examined, to aid in the determination of what types of information may be of greatest utility in subsequent iterations (if required) of the risk assessment.

The *risk characterization phase* of the ERA involves the integration of results from the analysis phase to develop an estimate of the potential risk posed to the ecological entities included in the assessment endpoints, as identified in the problem formulation phase. The risk estimate will be characterized in terms of the significance of any adverse effects. The uncertainties inherent in the risk estimate will also be described and considered in preparing the conclusions of the ERA.

The remainder of this document is organized as follows:

- Section 2: SLERA and initial SMDP
- Section 3: Step 3a of a BERA
- Section 4: Final SMDP conclusions and recommendations
- Section 5: References

2. SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

This SLERA is comprised of the screening level problem formulation (Section 2.1), screening level exposure assessment (Section 2.2), screening level effects characterization (Section 2.3), and refined risk calculations (Section 2.4).

2.1 Screening Level Problem Formulation

Problem formulation provides the foundation for the SLERA by describing or defining:

- Site operational history (Section 2.1.1).
- Ecological setting (Section 2.1.2).
- Historical sampling data (Section 2.1.3).
- Potentially exposed ecological receptors (Section 2.1.4).
- Complete pathways by which ecological receptors could be exposed to those constituents (Section 2.1.5).
- Assessment and measurement endpoints for screening ecological risk (Section 2.1.6).
- A conceptual site model (CSM) (Section 2.1.7).

Information contained within this section was derived from multiple sources, including the *U.S. EPA RCRA Corrective Action Current Conditions Report* (CCR; Payne Firm 2007), *Phase I Environmental Site Assessment and Compliance Evaluation* (Enviro-Sciences, Inc. 2002), *Baseline Environmental Assessment* (Payne Firm 1997), and *Preliminary Review/Visual Site Inspection Report* (USEPA 1989). On July 11, 2008, a site visit was conducted by a senior-level ecological risk assessor from Ramboll Environ. The site visit was implemented to determine site land use, surrounding land uses, site ecology, the potential presence of threatened or endangered species and ecological receptors, and the presence or absence of ecologically susceptible areas. Additional site-related ecological information was obtained during environmental sampling (i.e., surface water, sediment, sediment porewater [i.e., the interstitial water within the sediment], and surface soil) activities during the week of September 22, 2008. Photographs of site features are included in Attachment 1.

The following Solid Waste Management Units (SWMUs) and Areas of Interest (AOIs) were identified in the CCR (Payne Firm 2007) and the USEPA's December 6, 2007 comments on the CCR and are included as the study area in this evaluation.

- *SWMU 22* – Process Pond.
- *SWMU 23* – Land Application Treatment Area.
- *AOI B* – Former Process Wastewater Sewer.
- *AOI C* – Historical Debris Area.

Both the Process Pond (SWMU 22) and Land Application Treatment Area or sprayfield (SWMU 23) were permitted and engineered to manage site-related process and sanitary wastewater. As such, these two areas have little to no ecological value. However, in accordance with USEPA's December 6, 2007 correspondence commenting on the CCR, SWMUs 22 and 23 are considered in this evaluation.

2.1.1 Operational History

Baldwin Piano purchased the property (formerly farmland) in 1952 and manufactured pianos until 1958 (Payne Firm 2007, 1997). Heekin Can then purchased the property and began manufacturing (i.e., cutting, coating, printing, and assembling) three-piece cans. From 1973 to 1989, Heekin Can added two-piece can manufacturing operations using a drawn and iron (D&I) process (Payne Firm 1997, 2007). In 1993, Ball purchased the facility and continued operating the three-piece can manufacturing facility. In 1996, Milton Can, a division of Bway, purchased the facility; Bway continues to manufacture three-piece steel cans at the facility.

2.1.2 Ecological Setting

The Bway facility is located in Anderson Township, Hamilton County, Ohio, approximately five miles east of Cincinnati, Ohio, at 39°08'21" North latitude and 84°19'15" West longitude (Figure 1). The facility currently occupies two parcels of 77 total acres (Payne Firm 2007) and is topographically generally flat, sloping slightly to the north (Enviro-Sciences 2002). The facility is immediately bounded to the north and west by closed gravel pits and undeveloped land. The Little Miami River lies approximately ¼-mile northwest of the facility, flowing to the southwest toward its confluence with the Ohio River (Photograph 1, Attachment 1). The facility is bound to the east by a Norfolk and Western railroad and to the south by Broadwell Road and an inactive landfill that was closed in 1986 (Enviro-Sciences 2002). The area surrounding the facility is mixed industrial, commercial, and residential, with an industrial manufacturing area to the east of the facility and residences south and southwest of Broadwell Road. A detailed description of the geology and hydrogeology of the site is located in the CCR (Payne Firm 2007).

A majority of the facility is either occupied with buildings or is paved (Figure 3). Various buildings house the main manufacturing operations, warehouse, and offices. The southern portion of the facility consists of a landscaped area, with a small cemetery, that is regularly maintained and offers little to no ecological value. A Process Pond (SWMU 22) is located in the northeast portion of the facility, along with the Land Application Treatment Area (SWMU 23) or sprayfield. To the north and west of the facility lies a closed sand and gravel quarry (AOI B) that is currently filled with water. In the eastern portion of the facility is a historical debris area (AOI C) that contains two small ponds. SWMU 22, SWMU 23, AOI B, and AOI C are discussed in detail below.

2.1.2.1 SWMU 22 – Process Pond

SWMU 22 consists of a small, half-acre process pond (Photograph 2, Attachment 1). The pond was constructed in 1987, in conjunction with the sprayfield (SWMU 23), to process site-related wastewater. Between 1987 and 1989, treated process wastewater from the two-piece can manufacturing process, along with treated sanitary wastewater from the Biological Treatment Plant, was held in the Process Pond before being discharged to the sprayfield *via* a land application system. Since 1989, after the cessation of the two-piece can manufacturing operation, only treated sanitary wastewater has been held in the Process Pond and subsequently applied to the sprayfield. As specified in the permit-to-install (PTI), issued by the Ohio Environmental Protection Agency (Ohio EPA) in 1985, a flow meter monitors effluent volume from the pond and a sample valve allows for sample collection to monitor effluent quality, if necessary, prior to land application (Payne Firm 2007).

The entire circumference of the pond is fenced, limiting potential wildlife access and use of the pond. No wildlife was observed in or near the pond during the 2008 site visit and subsequent sampling of the pond. A three- to five-foot wide dense strip of shrubby/woody vegetation covers the area between the fence and the pond's edge (Photographs 3 and 4, Attachment 1). A layer of green algae covered the surface of the pond during the 2008 sampling event (Photograph 2, Attachment 1).

The USEPA (1989) and the Payne Firm (2007) concluded that the potential of a release from this Process Pond to soil, groundwater, surface water, air, or subsurface gas was none to low given that the pond: (1) was built with a re-compacted clay liner and limestone surface covering the clay; (2) receives treated sanitary discharge from the Biological Treatment Plant; and (3) is typically 40 feet above the groundwater depth in this area. There have been no reported releases and no prior investigations targeting SWMU 22. In addition, the Process Pond represents very low value ecological habitat and is engineered to deter ecological use of the area. However, as stated above, SWMU 22 is considered in this evaluation at the USEPA's request.

2.1.2.2 SWMU 23 – Land Application Treatment Area

SWMU 23 is a 4.5 acre grass field (Photographs 5 and 6, Attachment 1). The permitted field was constructed in 1987, in conjunction with the Process Pond (SWMU 22), to disseminate site-related wastewater *via* a slow rate spray application system (SRAS). Between 1987 and 1989, the SRAS discharged treated process wastewater from the two-piece can manufacturing process, along with treated sanitary wastewater from the Biological Treatment Plant. Since 1989, after the cessation of the two-piece can manufacturing, the SRAS discharged only treated sanitary wastewater from the Process Pond. Based on information provided by representatives of Bway, the sprayfield is no longer in use. In addition, Bway is in the process of connecting the facility waste water system to the public sanitary sewer.

The SRAS consists of several spray heads distributed somewhat evenly across the field (Photographs 5 and 6, Attachment 1). Discharge rates are highly variable, ranging from 10 gallons to several hundred gallons per day (Payne Firm 2007). Monitoring requirements for the SRAS are stipulated in the PTI; however the requirements were developed inclusive of the treated process wastewater from the two-piece can manufacturing process, which was discontinued in 1989 (Payne Firm 2007). Groundwater and soil samples have been collected several times between 1989 and present. The USEPA (1989) and the Payne Firm (2007) concluded that the potential of a release to soil, groundwater, surface water, or soil gas from the sprayfield was low.

The permitted sprayfield is regularly maintained, such that the grass does not grow much higher than a typical residential lawn. A narrow band of deciduous trees surrounds the field, ranging in width from approximately 100 feet on the southern end of the field to approximately 150 feet between the northern edge of the sprayfield and the quarry pond to the north. Wildlife that may use the sprayfield are likely limited to transient, urban-tolerant species (e.g., American robin, European starling, Norway rat) given: (1) the industrial nature of the site and the surrounding area; (2) that the field is regularly maintained; and (3) that the sprayfield was engineered for SRAS. For these reasons, SWMU 23 represents very low value ecological habitat. However, as stated above, SWMU 23 is considered in this evaluation at the USEPA's request.

2.1.2.3 AOI B – Former Process Wastewater Sewer

AOI B consists of a former process wastewater sewer that discharged to an off-property sand and gravel pit to the north of the facility. From the early 1970s to 1987, treated process wastewater from the two-piece can manufacturing process and site-related storm water was discharged *via* a 15 inch sewer to the surface water of the off-site closed gravel pit (Payne Firm 2007). Because of the Ohio EPA's concerns about process water discharge to an off-property area without a National Pollutant Discharge Elimination System (NPDES) permit, the land application treatment system (including the SRAS and the Process Pond), along with the Biological Treatment Plant, was constructed on-site in 1987 to redirect the discharge of treated process wastewater. Presently, only storm water runoff is discharged into the closed gravel pit.

The approximately 50-acre gravel pit is currently filled with water, presumably primarily from groundwater infiltration, and extends to the western side of the facility (Photographs 8 and 9, Attachment 1). According to the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI), the off-site closed quarry pond area is classified as palustrine, unconsolidated bottom, semi-permanently flooded, excavated (PUBFx); palustrine, unconsolidated bottom, intermittently exposed, excavated (PUBGx); and palustrine, emergent, semi-permanently flooded, excavated (PEMFx) (Figure 4). The depth of the off-site closed quarry pond varies greatly across the area and drops off rather sharply approximately 20 feet to 30 feet from the shoreline, reflecting the various stages of sand and gravel excavation. During environmental sampling in September 2008, the depth of water in the quarry pond ranged from approximately 6 feet to 18 feet deep, following a north-south transect along the northern portion of the pond (Figure 5).

Deciduous trees generally line the circumference of the off-site closed quarry pond, ranging from approximately 50 feet wide in the western portion to approximately 200 feet wide in the northern, eastern, and southern portions of the pond area. The north bank of the off-site closed quarry pond slopes steeply upward to Round Bottom Road, which lies on the plateau between the Little Miami River and the closed quarry pond. Similarly, the southern and western banks of the off-site closed quarry pond along the facility perimeter also slope steeply from the edge of the facility down to the water's edge.

During the site visit and environmental sampling in 2008, several types of waterfowl, great blue herons, frogs, deer, turkey vultures, and a red-tailed hawk were observed in and around the off-site closed quarry pond. Evidence of beaver was also noted. On several occasions, fish were observed jumping out of the water.

2.1.2.4 AOI C – Historical Debris Area

AOI C is a former gravel pit located to the southeast of the facility that was used to dump site-related and residential household (i.e., brought in by employees and local residents) debris from the 1960s to the early 1990s. According to the Payne Firm (1997, 2007), dumping was restricted to the south-southwest edge of the former gravel pit, and debris consisted of 55-gallon drums, scrap metal cans and lids, waste solder flux, pallets, scrap wood, and trash. During the 1970s and early 1980s, solvents from containers and drums were emptied onto the debris and ignited, providing the local county fire department with a training exercise for its personnel (Payne Firm 2007). After several burning events, the debris was typically covered with a layer of soil. In 2003, CEC was contracted by Ball, with the consent of Ohio EPA and the Hamilton County Health Department, to remediate the debris area by clearing and disposing of the debris, creating an engineered slope, and resurfacing the area with a vegetative cover. These clean-up and cover activities were deemed to have met the approval of the Hamilton County Health District in a letter dated November 13, 2003.

At the bottom of the former gravel pit, southeast of the facility, two small, shallow ponds are present (Photographs 9 and 10, Attachment 1). One of the ponds is labeled PEMFx by the USFWS NWI (Figure 4). Based on groundwater elevations, it is believed that the surface water represents the local groundwater table (Payne Firm 2007). The ponds are surrounded by a deciduous wooded area, approximately 500 feet wide, bounded to the west by the facility, to the north by SWMUs 22 and 23, to the east by the Norfolk and Western Railroad, and to the south by the facility and Broadwell Road. Since the wooded area is relatively small and immediately surrounded by an industrial/residential area, wildlife in this area is likely limited to transient, urban-tolerant species. During the site visit and environmental sampling in 2008, frogs were heard calling in the ponds, and tracks of raccoon and deer were observed. The ponds are too small to support fish populations, and fish were not observed in 2008.

2.1.3 Detected Constituents

To inform the screening level problem formulation, this section provides a general description of the constituents historically detected in the study area. A complete description of historical site investigative activities is provided in the CCR (Payne Firm 2007). A detailed quantitative summary of the constituents detected, the concentrations detected, and locations of detected concentrations from environmental sampling completed in 2008 is provided in the exposure assessment section of this report (Section 2.2).

- *SWMU 22.* Consistent with the PTI, the pond was monitored every six months until 2003 for the following: chemical oxygen demand (COD), total suspended solids, total dissolved solids, pH, fluoride, sulfate, and total chromium. Prior to environmental sampling in 2008, no previous other investigation targeted the Process Pond.
- *SWMU 23.* Consistent with the PTI, surface and subsurface soil from within the sprayfield was monitored from 1990 to 2001 for the following: nutrients, pH, exchangeable cations, and heavy metals. Similarly, groundwater downgradient of the sprayfield was monitored for the following: specific conductance, chloride, fluoride, sulfate, COD, nitrate-nitrogen, total phosphorus, and hardness. Trichloroethylene (TCE) was detected in one groundwater monitoring well within the sprayfield during the 1999 Phase II investigation; however, TCE was attributed to an off-property source (Payne Firm 2007). In August 2007, TCE and a few total metals (e.g., arsenic, chromium, lead, iron, and manganese) were detected in groundwater from SWMU 23.
- *AOI B.* Prior to the environmental sampling in 2008, no previous investigation (other than visual) targeted the former process wastewater sewer.

- *AOI C.* In 1999, soil, sediment, and surface water samples were collected in the historical debris area by Civil and Environmental Consultants (CEC) (1999). Soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, herbicides, and pesticides. Sediment samples were analyzed for SVOCs, metals, herbicides, and pesticides. Surface water samples were analyzed for VOCs, SVOCs, and dissolved metals. No chemical exceeded applicable regulatory levels.

2.1.4 Potential Ecological Receptors

In this subsection, potential ecological receptors are identified based on the environmental setting within the study area and a review of pertinent information.

2.1.4.1 Threatened and Endangered Species

The Natural Heritage Program of the Ohio Department of Natural Resources (ODNR) was contacted to obtain information on state-listed plants and aquatic and terrestrial wildlife that may potentially inhabit or frequent the site or the surrounding one-mile area, as well as critical or exemplary habitat. No records of rare or endangered species, significant habitats, or unique ecological sites were identified on-site. Within one mile of the site are located the Little Miami Kroger Hill Nature Preserve, Little Miami Scenic State Park, Little Miami State and National Scenic River, Avoca Park, and an oak-maple forest plant community. Several special concern, threatened, potentially threatened, or endangered species were located within one mile of the study area (see Attachment 2); however none of these species are located within the study area for this ERA. Correspondence with ODNR is included in Attachment 2.

The USFWS in Columbus, Ohio was contacted to obtain information on federal threatened and endangered species on-site or within a ½ mile of the site. No Federal wildlife refuges, wilderness areas, or critical habitat were identified within the vicinity of the study area. The site lies within the range of the Indiana bat (*Myotis sodalis*), the running buffalo clover (*Trifolium stoloniferum*), the sheepnose mussel (*Plethobasus cyphyus*), and the snuffbox mussel (*Epioblasma triquetra*). The USFWS stated that "due to the project location and onsite habitat, no impact is expected for these species [i.e., the sheepnose and snuffbox mussel]." Correspondence with USFWS is included in Attachment 2. The Indiana bat and running buffalo clover are discussed below.

The Indiana bat is a Federally-listed endangered species. In summer, most female Indiana bats migrate from winter hibernacula to establish nursery colonies. These colonies are usually housed in trees that have exfoliating bark with space for bats to roost (USFWS 1999). They primarily forage over wooded stream corridors. As discussed in Section 2.1.2, there are no streams present within the study area. The Little Miami River, located to the northwest of the facility, may provide suitable habitat for Indiana bats. Given the industrial, disturbed nature of the study area and the presence of suitable habitat off-site, it is unlikely that Indiana bats would be present within the study area. Furthermore, there are no remedial activities planned for the wooded portions of the study area.

The running buffalo clover is a Federally-listed endangered species. According to the USFWS, known locations of the running buffalo clover occur within three miles of the study area. The running buffalo clover prefers mesic habitats with partial to filtered sunlight; it cannot tolerate full sun or full shade. The clover occurs in areas where there is periodic disturbance (e.g., mowing, trampling, or grazing). Within the study area, the permitted sprayfield (SWMU 23) is the only area that could potentially support the running buffalo clover. However, a majority of the sprayfield is exposed to full sunlight, limiting potential clover habitat to only the wooded margins of the sprayfield. Because of the constant exposure to full sunlight, the field tends to be dry rather than mesic for most of the year. For these reasons, a significant population of the running buffalo clover is not expected to be present within SWMU 23. The SRAS is expected to continue normal operation, and there are no remedial activities planned for this area that would change the existing habitat and impact the running buffalo clover, if it is present.

2.1.4.2 Receptors of Interest

Most healthy aquatic and terrestrial ecosystems support a variety of organisms that are potential ecological receptors of chemical exposures, including benthic (i.e., bottom-dwelling) and terrestrial invertebrates, aquatic vertebrates, birds, and mammals. Due to the highly industrialized nature of the site and the close proximity to industrial and residential areas, wildlife that may use the site are likely limited to transient, urban-tolerant species.

It is not feasible to complete risk calculations for all species potentially exposed. Such an effort would also be duplicative because of the similarity of exposure patterns among closely related species and those with like feeding guilds. For these reasons, representative receptors of interest (ROIs) are selected. These ROIs are representative of entire classes of organisms (i.e., functional groups). Selection criteria for ROIs include sensitivity, exposure potential, expected presence at the site, ecological relevance, trophic level, feeding habits, and the availability of life history information. The rationale for selecting each ROI is discussed below.

- *Invertebrates*. The benthic and terrestrial invertebrate community live in constant and direct contact with surface sediment/sediment porewater and surface soil, respectively, that may be impacted. Invertebrates have vital functions within the ecosystem, including serving as a prey base for higher trophic level organisms and cycling of nutrients.
- *Fish*. The fish community lives in constant and direct contact with surface water that may be impacted. Exposures are also possible *via* sediment and the food chain (i.e., secondary consumers), particularly for bioaccumulative constituents. The fish community often dominates the aquatic ecosystem, in terms of biomass, and fish serve as a prey base for piscivorous wildlife.
- *Plants*. Plant roots are in constant and direct contact with soil or wetland sediment that may be impacted by constituents. Plant communities provide food for herbivores and essential habitat for many animal species.
- *Wildlife*. Birds and mammals are exposed to constituents in surface water, sediment, and surface soil primarily through prey ingestion. As higher trophic level species, birds and mammals are susceptible to compounds that bioaccumulate through the food chain. Individual foraging strategies and choices of prey may also promote incidental sediment and/or soil ingestion. Because this site is highly industrialized, wildlife that may use it are likely limited to transient, urban-tolerant species. Representative species of birds and mammals are not considered for the screening assessment but are identified in Section 3.2.3 for evaluation in Step 3a of the BERA.

Amphibians, such as frogs, live in constant and direct contact with surface water that may be impacted, but amphibians are not identified as a receptor group in this ERA. However, amphibians are of interest in that they may demonstrate exposure potential in aquatic environments. As there is currently inadequate eco-toxicological data for amphibians (and reptiles), these organisms, although of ecological value, are difficult to utilize in ecological risk calculations. Risk management decisions that are protective of other functional groups, however, are generally considered to be protective of both amphibians and reptiles.

2.1.5 Potentially Complete Exposure Pathways

A complete exposure pathway is one in which constituents can be traced or are expected to travel from the source to a receptor (USEPA 1997). Therefore, a chemical and an exposure point (i.e., surface water, sediment, sediment porewater, or surface soil), its release and migration from the source, a receptor, and an exposure route through which the receptor takes up the chemical must all be present in order for a pathway to be considered complete.

Potential chemical sources and exposure pathways are described below for SWMU 22, SWMU 23, AOI B, and AOI C. The potentially complete exposures pathways described here are further evaluated as part of the identification of assessment endpoints for the ERA.

- *SWMU 22*. The Process Pond is a permitted, engineered structure that is part of the SRAS for the sprayfield (SWMU 23). The pond receives treated sanitary wastewater from the Biological Treatment Plant prior to the water being discharged to the sprayfield. This area represents no- to low-value habitat quality. Although the presence of benthic organisms in the Process Pond is unlikely given the function of the pond, benthic organisms are included in the evaluation of SWMU 22. Benthic organisms (e.g., insect larvae) are potentially exposed to constituents in sediment through direct contact between sediment porewater and structures, such as gills and setae, and ingestion of sediment. Fish have not been observed in the Process Pond and are not evaluated in this ERA. A fence surrounding the circumference of the pond limits wildlife exposure. Nonetheless, because waterfowl may transiently utilize the Process Pond, birds are evaluated in this ERA with respect to SWMU 22.
- *SWMU 23*. The sprayfield is a permitted, engineered structure for discharging treated sanitary wastewater from the Process Pond (SWMU 22). This area represents low value habitat quality. Plants are exposed to constituents in soil through direct contact with and uptake by roots, while soil invertebrates (e.g., earthworms) are exposed through direct contact and soil ingestion. Biota potentially act as both a receptor and a secondary source of chemical contamination. For bioaccumulative constituents, plant and invertebrate tissue also serve as a source of exposure for transient birds and mammals. Wildlife are potentially exposed *via* inhalation, dermal contact, ingestion of terrestrial prey, and incidental soil ingestion. Although inhalation and dermal exposures occur, these routes are poorly characterized for most wildlife species. Ingestion of prey is assumed to dominate wildlife exposure. Since some constituents bioaccumulate throughout the food web, concentrations of constituents in prey may be elevated relative to concentrations in surface soil.
- *AOI B*. Site-related constituents may have entered the off-site closed quarry pond *via* the sewer located on the southern bank of the pond (north of the facility) and/or groundwater infiltration. Both direct and indirect exposure pathways likely exist for

invertebrates and fish in the off-site closed quarry pond and for birds and mammals that utilize area. Biota potentially act as both a receptor and a secondary source of chemical contamination. Possible exposure routes include inhalation, dermal contact, ingestion through diet, and ingestion of surface water and/or sediment. Benthic invertebrates (e.g., crayfish, insect larvae) are potentially exposed to constituents in sediment through direct contact between sediment porewater and structures, such as gills and setae, and ingestion of sediment. Fish may be potentially exposed *via* gill transfer from water, water and/or sediment ingestion, prey ingestion, or dermal contact with surface water. Wildlife are potentially exposed *via* inhalation, dermal contact, and ingestion of aquatic prey, drinking water, and incidental sediment ingestion. Although inhalation and dermal exposures occur, these routes are poorly characterized for most wildlife species. Ingestion of prey is assumed to dominate wildlife exposure. Since some constituents bioaccumulate throughout the food web, concentrations of constituents in prey may be elevated relative to concentrations in surface water or sediment.

- *AOI C*. Potential habitat within the historical debris area includes the two small, shallow ponds at the bottom of the former gravel pit and the associated woodland habitat. Site-related constituents may have entered the ponds through surface runoff and/or groundwater infiltration. Aquatic plants are exposed to constituents in sediment through direct contact with and uptake by roots. Invertebrates and amphibians may be exposed *via* direct contact with sediment and water, as well as ingestion of prey. Since the ponds are shallow, it is unlikely that fish are present, and fish have not been observed in the ponds. While wildlife use of this relatively isolated area is expected to be transient, highly adaptable species such as raccoons or Canada geese could potentially be exposed to constituents through consumption of plants and animal prey and ingestion of sediment. As noted above, ingestion pathways are assumed to be the primary routes of exposure for wildlife in this ERA. Soil within the woodland habitat may be affected by site-related constituents leaching from the debris and/or surface runoff. Plants are exposed to constituents in soil through direct contact with and uptake by roots, while soil invertebrates are exposed through direct contact and soil ingestion. Wildlife could potentially be exposed to constituents through consumption of plants and prey and ingestion of soil.

2.1.6 Assessment and Measurement Endpoints

Assessment endpoints are the explicit expression of ecological entities (e.g., mammal populations) and attributes (e.g., reproductive ability) to be protected (USEPA 1997, 2004). The selection of assessment endpoints depends on knowledge about the receiving environment, constituents released (including ecotoxicological properties and concentrations that cause adverse impacts), and the values that will drive risk management decision-making (Suter et al. 1995). According to USEPA (1997),

> "for the SLERA, assessment endpoints are any adverse effects on ecological receptors, where receptors are plant and animal populations and communities, habitats, and sensitive environments. Many of the ecotoxicity screening values are based on generic assessment endpoints (e.g., protection of aquatic populations or communities from changes in structure or function) and are assumed to be widely applicable to sites around the United States."

The specific assessment endpoints considered for this SLERA are:

- Maintenance of the current functioning level of benthic invertebrate community structure in SWMU 22, AOI B, and AOI C;
- Maintenance of the current functioning level of fish community structure in AOI B;
- Maintenance of the current survival and reproduction level of the aquatic-feeding bird and mammal populations in SWMU 22 (birds only), AOI B, and AOI C; and
- Maintenance of the current survival and reproduction level of the terrestrial-feeding bird and mammal populations in SWMU 23 and AOI C.

"Community structure and function" refers to the types and diversity of species present and their ecological roles (for example, serving as prey for wildlife). Community structure and function generally does not depend on the presence or absence of any single species. "Population" refers to a group of interbreeding individuals of a single species, occurring within a geographic area (Barnthouse et al. 2007; USEPA 1999).

Note that although exposure pathways for plants and terrestrial (i.e., soil-associated) invertebrates are potentially complete in portions of the study area, these receptors are assigned a low value for purposes of risk management decision-making. Plants and soil invertebrates are of interest, however, to the extent that they may represent a chemical exposure pathway for wildlife species. The important protection goal within the study area is to prevent adverse effects on aquatic- and terrestrial-feeding wildlife. Thus assessment endpoints for plants and terrestrial invertebrates are not identified in this ERA.

A measurement endpoint is defined as a measurable ecological characteristic that is related to the valued characteristic chosen as the assessment endpoint, and is a measure of biological effects. More than one measurement endpoint may be selected for a given assessment endpoint. For this SLERA, measurement endpoints are simply defined as the comparison of measured chemical concentrations in surface water, sediment, sediment porewater, and surface soil to relevant toxicological information.

Because direct measurement of assessment endpoints is often difficult or impossible, measurement endpoints are used to provide the information necessary to evaluate whether the values associated with the assessment endpoint are being protected. A measurement endpoint is a measurable ecological characteristic and/or response to a stressor (USEPA 1998). In this SLERA, potential adverse effects of constituents on the survival or reproduction of ecological receptors are indirectly evaluated in the initial screening evaluation through a comparison of maximum detected chemical concentrations to conservative ecotoxicity screening levels. Additional chemical-specific information (e.g., background concentrations, published toxicity data) is considered in the refined screening evaluation (Step 3a of the BERA) for only those constituents with maximum concentrations that exceed the ecotoxicity screening levels and those constituents for which such criteria are unavailable.

2.1.7 Conceptual Site Model

A CSM is a written representation of predicted relationships between ecological entities and the stressors to which they may be exposed. The CSM for this ERA integrates the potentially complete exposure pathways identified in Section 2.1.5 and the assessment endpoints identified in Section 2.1.6. The CSM is presented in Table 1.

2.2 Screening Level Exposure Assessment

Environmental samples collected from the study area in 2008 were used in the evaluation of potential ecological risks. Surface water, sediment, sediment porewater, and surface soil sample collection completed in September 2008 was consistent with the *Sampling and Analysis Plan #3* (Payne Firm 2008) that was approved by USEPA during a conference call on August 21, 2008.

Consistent with USEPA (1997, 2000a, 2001) guidance, exposure estimates used in this ERA are the maximum concentrations of constituents detected in surface water, sediment, sediment porewater, and surface soil for sampling conducted in SWMU 22, SWMU 23, AOI B, and AOI C. For purposes of this ERA, only surface (i.e., 0 – 6 inches below ground surface) soil was used in this evaluation, as ecological receptors typically do not contact subsurface soil. At the USEPA's request, sediment porewater samples were collected from three near-shore locations within the closed quarry pond (AOI B). These data are used to assess water quality in the groundwater/surface water transition zone.

The following general data handling practices were applied: (1) duplicate results were averaged; and (2) sediment and soil concentrations are reported on a dry weight basis. Summary statistics (i.e., minimum and maximum detected concentrations, arithmetic mean, and frequency of detection) for detected constituents in surface water, sediment, sediment porewater, and surface soil are presented in Tables 2, 3a, 4, and 5a, respectively. Surface water quality sampling results are presented on Figure 5.

2.3 Screening Level Effects Characterization

The screening level ecological effects evaluation involves the identification of appropriate ecotoxicity screening levels for detected constituents in each environmental medium. Ecotoxicity screening levels are chemical concentrations in environmental media below which there is negligible risk to receptors exposed to those media (USEPA 2000a). The ecotoxicity-based screening values used in the selection of preliminary constituents of potential ecological concern (COPECs) were purposefully chosen to ensure that the process is inherently conservative, by focusing on values that reflect adverse effects in individual organisms. This means that a larger number of constituents may be identified as COPECs than are likely to pose significant risks of population-level effects. Although the first of USEPA's (1999) risk management principles is to reduce risks to levels that will result in recovery and maintenance of healthy local populations and communities of biota, SLERAs typically focus on individual-level effects to ensure the conservatism of the outcome. The selected screening levels for use in this SLERA for surface water, sediment, sediment porewater, and surface soil are presented in Tables 2, 3a, 4, and 5a and are described below.

For constituents detected in surface water and sediment porewater, the Ohio EPA's outside mixing zone average (OMZA) water quality criteria for the Ohio River drainage basin were selected as primary screening values. The criteria for certain metals are dependent on hardness and are calculated separately for each SWMU and AOI. Water quality criteria are not available from Ohio EPA for certain constituents detected in surface water and porewater. In these cases, USEPA (2003a) Region 5 Ecological Screening Levels (ESLs) are used. The ESLs are designed to be highly conservative and protective of aquatic-feeding wildlife (i.e., considering bioaccumulation) as well as benthic organisms and fish. Concentrations below the ESLs are unlikely to pose an ecological risk, whereas more information is needed to assess risks if concentrations are above the ESLs. For a few constituents, the USEPA (2006) ambient water quality criteria were used, as neither an Ohio EPA nor an ESL value was available.

For metals detected in sediment, Ohio-specific sediment reference values (SRVs) developed by the Ohio EPA (2003) were used preferentially. The SRVs were developed based on metal concentrations in sediment at reference stations used in the Ohio EPA's biological monitoring program. These locations are relatively unimpacted by human activity and support high quality fish and invertebrate communities. The SRVs were developed separately for several ecoregions in Ohio; the Interior Plateau ecoregion was used in this evaluation. In cases where a SRV was not available for a given metal and for all other constituents detected in sediment, the USEPA (2003a) Region 5 ESLs were used.

For constituents detected in soil, USEPA ecological soil screening levels (Eco-SSLs) were selected as primary screening values (USEPA 2005a). Eco-SSLs are the preferred source of ecotoxicity screening values for soil, because they were developed based on multiple ecological receptors (e.g., plants, soil invertebrates, birds, and mammals), using species sensitivity distributions to fully characterize ecotoxicity and considering appropriate species-specific exposure factors. For those constituents lacking Eco-SSL values, USEPA (2003a) ESL values were used.

For surface water, sediment, and soil, the following elements were identified as essential nutrients: calcium, magnesium, potassium, and sodium. These nutrients are unlikely to cause adverse effects except at extreme concentrations. Since there does not appear to be evidence of extreme concentrations of these nutrients on-site, they are not considered further in this ERA.

2.4 Screening Level Risk Characterization

The screening level risk characterization involves the calculation of hazard quotients (HQs), which are the ratio of the maximum exposure estimate with the ecotoxicological screening values identified in the screening level ecological effects characterization. The unitless HQs are considered a measurement endpoint that can provide understanding of potential ecological risks. An HQ equal to or less than a value of 1 (to one significant figure) indicates that adverse impacts are considered unlikely (USEPA 1997, 2000a, 2004). An HQ greater than 1 is an indication that further evaluation may be necessary to evaluate the potential for adverse impacts. Therefore, those constituents in surface water, sediment, sediment porewater, and surface soil with HQs greater than 1 are conservatively carried forward as preliminary COPECs into the BERA. In addition, those constituents for which no screening values exist are carried forward as preliminary COPECs. Based on this screening the following preliminary COPECs were identified:

Identified Preliminary COPECs	
Preliminary COPEC	**Area**
Surface Water (Table 2)	
Benzo(e)pyrene*	AOI B
Chrysene*	AOI B
Aluminum	SWMU 22, AOI C
Iron	AOI C
Manganese*	SWMU 22, AOI B, AOI C
Mercury	SWMU 22, AOI B
Sediment (Table 3a)	
Acetone	SWMU 22, AOI B, AOI C
Acetonitrile	SWMU 22
2-Butanone	SWMU 22
Carbon disulfide	SWMU 22
Xylenes, total	SWMU 22
Polycyclic aromatic hydrocarbons (PAHs)*	SWMU 22, AOI B, AOI C
Biphenyl*	SWMU 22, AOI B, AOI C
Bis(2-ethylhexyl)phthalate (BEHP)	SWMU 22
Aluminum	SWMU 22
Antimony*	SWMU 22
Arsenic	SWMU 22
Beryllium*	AOI B, AOI C
Cadmium	AOI C

Identified Preliminary COPECs	
Preliminary COPEC	**Area**
Chromium	SWMU 22
Copper	SWMU 22, AOI C
Lead	SWMU 22, AOI C
Nickel	SWMU 22
Selenium	AOI C
Silver	SWMU 22
Vanadium*	SWMU 22, AOI B, AOI C
Zinc	SWMU 22, AOI B, AOI C
Sediment Porewater (Table 4)	
Aluminum	AOI B
Iron	AOI B
Manganese*	AOI B
Surface Soil (Table 5a)	
Aluminum*	SWMU 23, AOI C
Cadmium	AOI C
Chromium, total	SWMU 23, AOI C
Copper	AOI C
Iron*	SWMU 23, AOI C
Lead	SWMU 23, AOI C
Manganese	SWMU 23
Mercury	AOI C
Selenium	AOI C

Identified Preliminary COPECs	
Preliminary COPEC	**Area**
Thallium	SWMU 23
Vanadium	SWMU 23, AOI C
Zinc	SWMU 23, AOI C
Notes: * No screening value is available.	

Following this SLERA, the initial SMDP is to carry the preliminary COPECs identified above into Step 3a of a BERA (Section 3), including refinement of the COPECs, exposure, effects, and risk characterization for this ERA.

3. BASELINE ECOLOGICAL RISK ASSESSMENT: STEP 3A

As described in Section 1, Step 3a of the ERA process is an opportunity for iterative refinement of potential risks using methods similar to those used in Steps 1 and 2 (USEPA 2000a, 2001). Specifically, Step 3a of the BERA considers background concentrations, alternative ecotoxicological benchmarks, reference concentrations, more representative exposure estimates, bioavailability, and additional toxicological information to further evaluate the potential for constituents to adversely affect aquatic organisms and aquatic-feeding wildlife. The refined screening evaluation presented in this section more fully describes the COPECs in each media and locations that may have the potential to adversely affect ecological receptors. This section is organized as follows:

- Refinement of identified preliminary COPECs (Section 3.1)
- Refined measurement endpoints (Section 3.2)
- Refined exposure estimates (Section 3.3)
- Refined effects characterization (Section 3.4)
- Refined risk calculations (Section 3.5)
- Uncertainties analysis (Section 3.6)

3.1 Refinement of Identified Preliminary COPECs

The second tier of the screening process considers background concentrations and additional toxicological information to further evaluate the potential for constituents to adversely affect aquatic organisms and aquatic- and terrestrial-feeding wildlife. The refined screening evaluation presented in this section more fully describes which COPECs in which media and at which locations that may have the potential to adversely affect ecological receptors.

Following the initial screening evaluation, it is typical to consider background concentrations in an ERA, particularly for metals. In this ERA, background concentrations for metals in soil are based on typical values for Ohio soils (Ohio EPA 2008; Dragun and Chekiri 2005), as summarized in Table 5b. As shown on Table 5b, the maximum detected surface soil concentrations of lead, vanadium, and zinc in SMWU 23 are less than the respective background concentrations and are not considered further in this ERA for SWMU 23. For AOI C, maximum detected concentrations of cadmium, chromium, iron, and vanadium are less than the respective background concentrations and are not considered further in this ERA for AOI C surface soil.

One line of evidence used in the refinement of COPECs is consideration of total metals versus dissolved metals analyses. The use of dissolved metals concentrations have been shown to more accurately predict aquatic toxicity than total metals analyses, because they better reflect the metal concentrations that are bioavailable (or available for uptake) to aquatic organisms. Furthermore, dissolved metals are the basis of USEPA and Ohio EPA water quality criteria. For this reason, dissolved metal analyses provide the most appropriate means of assessing risks to aquatic organisms (Bergman and Dorward-King 1997; USEPA 1985, 1993a, 1995; Prothro 1993).

The derivation of sediment quality benchmarks (SQBs) through the use of equilibrium partitioning (USEPA 2000b,c,d, 2005b; Di Toro et al. 1991; Fuchsman 2003) was also used as a line of evidence for certain organic constituents in this refinement of COPECs. The equilibrium approach takes into consideration chemical-specific and site-specific characteristics that mitigate bioavailability, and thus toxicity, of constituents. This approach was used as part of the development of the ESLs; however, the underlying assumptions are not documented on a chemical-specific basis. Also, the equilibrium partitioning approach, as applied in ESL development, incorporates a mathematical error that results in inappropriately low screening values for less-hydrophobic organic compounds. Therefore, alternative values are calculated for certain organic constituents in this ERA, as described below.

The equilibrium partitioning approach uses the mass fraction of organic carbon in sediment (foc) and the chemical-specific partition coefficient between water and organic carbon (Koc) to calculate SQBs as follows:

Sediment quality benchmark = Water quality benchmark × Koc × foc

This equation is appropriate for hydrophobic (non-polar) organic compounds. For less hydrophobic compounds (that is, compounds having log octanol-water partition coefficient (Kow) values below 3.5), Fuchsman (2003) developed the following corrected method for calculating sediment screening values:

$$\text{Sediment quality benchmark} = \text{Water quality benchmark} \times \left[\left(K_{oc} \times f_{oc} \right) + \left(\frac{1 - f_{solids}}{f_{solids}} \right) \right]$$

Where:

f_{solids} represents the mass fraction of sediment present as solids.

Water quality benchmarks are identified for use in calculating sediment quality benchmarks on a chemical-specific basis. Koc values are estimated from log Kow values according to the regression equation determined by Di Toro et al. (1991):

$$\log K_{oc} = 0.00028 + 0.983 \log K_{ow}$$

Log Kow values are obtained from the USEPA's Log Octanol-Water Partition Coefficient Program (KOWWIN) from EPI Suite v3.10. Organic carbon and solids content are based on site-specific data.

3.1.1 SWMU 22 – Process Pond

3.1.1.1 Surface Water

In Section 2.4, the following constituents were identified as preliminary COPECs in surface water for SWMU 22 (see Table 2): aluminum, manganese, and mercury. These constituents are discussed below, considering the availability and basis of criteria, background concentrations, toxicity information, chemical bioaccessibility, bioaccumulation potential, and other factors.

- *Aluminum*. The maximum total aluminum concentration in surface water from SWMU 22 exceeds the USEPA's chronic criterion of 87 micrograms per liter (µg/L); no other screening criteria exist for aluminum in surface water. However, the criteria document (USEPA 1988) states that "EPA is aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg aluminum/L, when either total recoverable or dissolved is measured." Furthermore, the USEPA lowered the water quality criteria for aluminum to be protective of the most sensitive aquatic species (i.e., brook trout and striped bass; USEPA 1988). SWMU 22 is a small, engineered pond that does not support fish species, particularly not salmonids. In addition, dissolved aluminum was not detected (see dissolved metals discussion in Section 3.1). For these reasons, aluminum in surface water is considered unlikely to adversely affect aquatic organisms within SWMU 22 and is not considered further in this ERA.
- *Manganese*. There is no Ohio EPA or USEPA screening criteria for manganese in surface water. However, a screening value is available from the Michigan Department of Environmental Quality (MDEQ). Using the mean site-specific (i.e., SWMU 22 only) hardness of 197 milligrams per liter (mg/L) as $CaCO_3$, an MDEQ final chronic value (FCV) for manganese can be calculated as 3.5 mg/L. This screening value is more than an order of magnitude higher than the maximum detected manganese concentration (i.e., 0.049 mg/L) in SWMU 22 surface water. Therefore, manganese does not merit further evaluation in SWMU 22 surface water.
- *Mercury*. The maximum total mercury concentration in surface water from SWMU 22 exceeds the Ohio EPA water quality criteria. However, dissolved mercury concentrations do not exceed Ohio EPA criteria (see dissolved metals discussion in Section 3.1). Therefore, mercury in surface water is considered unlikely to adversely affect aquatic organisms within SWMU 22 and is not considered further in this ERA.

Based on the above discussion, no constituents in surface water within SWMU 22 are considered further in this ERA.

3.1.1.2 Sediment

In Section 2.4, the following constituents were identified as preliminary COPECs in sediment for SWMU 22 (see Table 3a): acetone, acetonitrile, 2-butanone, carbon disulfide, total xylenes, several PAHs, biphenyl, BEHP, aluminum, antimony, arsenic, chromium, copper, lead, nickel, silver, vanadium, and zinc. Of these preliminary COPECs, PAHs, copper, lead, nickel, silver, and zinc will be further evaluated in Sections 3.2 through 3.5. The remaining constituents are discussed below, considering the availability and basis of criteria, background concentrations, toxicity information, chemical bioaccessibility, bioaccumulation potential, and other factors.

- *Acetone*. Acetone, a common laboratory contaminant, was detected in three sediment samples collected from SWMU 22 at a maximum concentration that exceeds the ESL. Based on an extensive review of the aquatic toxicity (Staples 2000) and bioavailability of acetone (Fuchsman 2003), an appropriate SQB for acetone, based on the water quality benchmark of 1.7 mg/L or the water ESL, a log Kow of -0.24, and an average SWMU 22-specific organic carbon (23.6 percent) and solids (25.5 percent) content, is calculated as 5.2 milligrams per kilogram (mg/kg; Table 6). The maximum acetone concentration in SWMU 22 sediment does not exceed this benchmark. Acetone is strongly hydrophilic and exhibits virtually no bioaccumulation potential. For these reasons, acetone is not expected to pose a significant ecological risk in SWMU 22 and does not merit further evaluation in sediment.
- *Acetonitrile*. Acetonitrile was detected in only one out of three sediment samples from SWMU 22, at a maximum concentration that exceeded the ESL. However, the basis for the sediment ESL of 0.056 mg/kg is unclear. The equilibrium partitioning approach, as applied in the ESL development, incorporates a mathematical error that results in inappropriately low screening values for less-hydrophobic organic compounds. An alternative SQB may be calculated for acetonitrile, based on the corrected methodology of Fuchsman (2003). As shown on Table 6, using the water quality benchmark of 12 mg/L or the water ESL for acetonitrile, a log Kow of -0.15, and an average SWMU 22-specific organic carbon (23.6 percent) and solids content (25.5 percent), a SQB for acetonitrile is calculated as 37 mg/kg. This benchmark is several times higher than the maximum reported acetonitrile concentration. Because acetonitrile is volatile, it does not persist in the environment and exhibits virtually no bioaccumulation potential. For these reasons, acetonitrile does not merit further evaluation in sediment.
- *2-Butanone*. 2-Butanone, also called methyl ethyl ketone, was detected at a maximum sediment concentration in SWMU 22 that exceeded the ESL. However, similar to acetonitrile, the basis of the ESL of 0.0424 mg/kg is unclear. As shown on Table 6, using the equilibrium partitioning approach and based on the water quality benchmark of 2.2 mg/L (the water ESL) and a log Kow of 0.26, together with an average SWMU 22-specific organic carbon content of 23.6 percent and a solids content of 25.5 percent, a SQB for 2-butanone is calculated as 7.4 mg/kg. This value is almost seven times higher than the maximum concentration reported in SWMU 22 sediment, indicating that 2-butanone does not pose a risk to benthic invertebrates. As a volatile compound, 2-butanone does not persist in the environment and exhibits virtually no bioaccumulation potential. For these reasons, 2-butanone does not merit further investigation in sediment.
- *Carbon disulfide*. The maximum carbon disulfide concentration in sediment from SWMU 22 exceeds the ESL. Carbon disulfide is a natural product that is released into the environment from a wide variety of natural sources. Due to its low affinity for sorption to organic substances, very little carbon disulfide is likely to partition to or remain in sediment. Furthermore, carbon disulfide is relatively non-toxic to aquatic organisms and has little or no tendency to bioaccumulate in biota because of its relatively low log Kow of 2.14 and rapid metabolism in most mammals (WHO 2002). For these reasons, carbon disulfide does not merit further consideration.

- *Xylenes*. Total xylenes were detected at a maximum concentration in SWMU 22 that exceeds the ESL. However, an appropriate SQB for xylenes, based on the water quality benchmark of 0.027 mg/L or the water ESL, a log Kow of 3.087, and an average site-specific organic carbon (23.6 percent) and solids (25.5 percent) content, is calculated as 7.0 mg/kg (Table 6). This value is almost ten times higher than the maximum concentration reported in SWMU 22 sediment, indicating that xylenes do not pose a risk to benthic invertebrates. Xylenes exhibit virtually no bioaccumulation potential. For these reasons, xylenes are not expected to pose a significant ecological risk in SWMU 22 and do not merit further evaluation in sediment.
- *BEHP*. The maximum BEHP concentration in sediment from SWMU 22 exceeds the ESL. Found in plastics, BEHP is ubiquitous in the environment and is a common laboratory contaminant. In aqueous exposures, BEHP is not toxic to aquatic organisms at concentrations up to the solubility limit (Call et al. 2001; Rhodes et al. 1995). Sediment spiked with 3,000,000 µg/kg BEHP had no effect on either survival or growth of midges and amphipods (Call et al. 2001). Based on these studies, BEHP is very unlikely to adversely affect organisms at the concentrations detected in sediment. Furthermore, Mackintosh et al. (2004) determined that concentrations of BEHP did not increase with increasing trophic position in a marine aquatic food web. This indicates that this compound does not bioaccumulate. Thus, BEHP does not merit further evaluation in sediment.
- *Aluminum*. Aluminum is the most commonly occurring metallic element, comprising 8 percent of the earth's crust (USEPA 2000e). The typical range of aluminum in soils is from 1-30 percent. Aluminum concentrations in SWMU 22 sediment range from 33,700 mg/kg to 90,200 mg/kg, exceeding the Ohio SRV of 28,000 mg/kg. There are no additional screening values available for aluminum in sediment. Shacklette and Boerngen (1984) report a range of 7,000 to 100,000 mg/kg for soils of the eastern United States (east of 96th meridian). The maximum SWMU 22 sediment aluminum concentration is within the range reported by Shacklette and Boerngen (1984). Aluminum does not bioaccumulate (USEPA 2000f). For these reasons, aluminum does not merit further evaluation in SWMU 22 sediment.
- *Antimony*. Antimony was detected in only one sediment sample from SWMU 22. No screening value is available for antimony in sediment. Information relating antimony concentrations in sediment to adverse ecological effects is generally lacking. However, antimony in surface water is known to be considerably less toxic than other metals such as copper and lead (USEPA 1986). It is reasonable to assume that antimony is also less toxic than these other metals when present in sediment. On this basis, adverse effects due to antimony in sediment are unlikely at the reported concentrations, and antimony does not merit further evaluation in SWMU 22 sediment.
- *Arsenic.* The maximum detected arsenic concentration in SWMU 22 sediment slightly exceeds the Ohio SRV (i.e., HQ=1.2) and the ESL (i.e., HQ=1.3) (Table 3b), whereas arsenic concentrations in the remaining two SWMU 22 sediments samples do not exceed criteria. Arsenic exists in oxygenated sediment in primarily two forms, arsenate (dominant form) and arsenite (more toxic and bioavailable form). Since the ESL is based on total arsenic, of which only approximately 20 percent is in the form of arsenite, toxicity is likely overestimated by as much as 80 percent (Neff 1997). Further, the maximum sediment arsenic concentration did not exceed the consensus-based probable

effects concentration (PEC) for arsenic (Ingersoll et al. 2000). For these reasons, arsenic does not merit further evaluation in SWMU 22 sediment.

- *Chromium.* Total chromium was detected at a maximum SWMU 22 sediment concentration that exceeds the Ohio SRV and the ESL (Table 3b). Although chromium does not form insoluble sulfide complexes, acid volatile sulfide (AVS) data can provide insight into the likelihood of sediment toxicity due to chromium (USEPA 2005b). The toxicity and bioavailability of chromium depend on whether it is present as trivalent or hexavalent chromium. Hexavalent chromium [Cr(VI)] is geochemically unstable in reducing environments where AVS is present, such that AVS and Cr(VI) will not coexist in sediments (USEPA 2005b; Martello et al. 2007). Trivalent chromium [Cr(III)] is highly insoluble and relatively non-toxic, and as a result, chromium toxicity is not expected in sediments that contain AVS (USEPA 2005b; Berry et al. 2004; Boothman et al. 1999; Becker et al. 2006). Indeed, amphipods that constructed burrows in chromium hydroxide precipitate exhibited no adverse effects in laboratory tests (Warren Boothman, USEPA, personal communication; Oshieda 1981). Consequently, chromium-related toxicity to benthic invertebrates is not expected in sediment samples that contain detectable AVS concentrations. Since AVS was present in sediment from SWMU 22, chromium does not merit further evaluation for benthic invertebrates in SWMU 22 sediment. However, because chromium may bioaccumulate, chromium is evaluated for potential effects to avian wildlife.
- *Vanadium.* A sediment screening value is not available for vanadium. However, an Ohio EPA (2003) SRV of 40 mg/kg is available for vanadium, based on a state-wide evaluation. The maximum detected SWMU 22 concentration in sediment for vanadium does not exceed this benchmark. Vanadium does not bioaccumulate. Therefore, vanadium does not merit further investigation in SWMU 22 sediment.

Based on the above discussion, the cumulative effect of PAHs and metals (i.e., copper, lead, nickel, silver, and zinc) in sediment to benthic invertebrates and PAHs and metals (i.e., chromium, copper, lead, nickel, silver, and zinc) in sediment to aquatic-feeding birds within SWMU 22 are considered in Sections 3.2 through 3.5 of this ERA. No screening value exists for biphenyl. Therefore, in this ERA, the evaluation of PAHs will address any potential adverse effects of biphenyl.

3.1.2 SWMU 23 – Land Application Treatment Area/Sprayfield

In Section 2.4, the following constituents were identified as preliminary COPECs in surface soil for SWMU 23 (see Table 5a): aluminum, total chromium, iron, lead, manganese, thallium, vanadium, and zinc. Maximum detected concentrations of lead, vanadium, and zinc are less than the respective background concentrations and are not considered further in this ERA for SWMU 23 surface soil (see Table 5b). The remaining constituents are discussed below, considering the availability and basis of criteria, background concentrations, toxicity information, chemical bioaccessibility, bioaccumulation potential, and other factors.

- *Aluminum*. A screening value is not available for aluminum in soil. As discussed above, aluminum is the most commonly occurring metallic element, comprising 8 percent of the earth's crust (USEPA 2000e). The typical range of aluminum in soils is from 1-30 percent. Aluminum concentrations in SWMU 23 surface soil range from 2,590 mg/kg to 20,900 mg/kg. Shacklette and Boerngen (1984) report a range of 7,000 to

100,000 mg/kg for soils of the eastern United States (east of 96th meridian). Aluminum concentrations reported for SWMU 23 soil are well within the range reported by Shacklette and Boerngen (1984). Aluminum does not bioaccumulate (USEPA 2000f). For these reasons, aluminum does not merit further evaluation in SWMU 23 surface soil.

- *Total chromium*. The maximum detected total chromium concentration (24.2 mg/kg) only slightly exceeds the background concentration (22.0 mg/kg) and the ESL (i.e., HQ=5.5) (Table 5c). However, measured Cr(III) and Cr(VI) concentrations do not exceed the USEPA Eco-SSL for avian or mammalian wildlife. Dragun and Chiasson (1991) report a range of chromium concentrations in Ohio soil from 15 mg/kg to 100 mg/kg, and the reported maximum chromium concentration from SWMU 23 falls in the lower portion of this range. There is no evidence of stressed or dead vegetation within the sprayfield of SWMU 23, indicating that the plant community is not adversely affected. For these reasons, chromium in SWMU 23 surface soil is not considered further in this ERA.
- *Iron*. A screening value is not available for iron in surface soil. However, for comparison, naturally-occurring iron concentrations in soil range from 100 mg/kg to greater than 100,000 mg/kg for soils in the Eastern United States (Shacklette and Boerngen 1984; Dragun and Chiasson 1991). According to the USEPA (2003b), direct chemical toxicity due to iron is of less concern than potential physical effects of iron flocculation or interactions with other metals. In addition, iron is not a bioaccumulative chemical (USEPA 2000f). For these reasons, iron in SWMU 23 surface soil is not considered further in this ERA.
- *Manganese*. The maximum detected concentration of manganese exceeds the Eco-SSL for both terrestrial plants and soil invertebrates, but does not exceed the Eco-SSL for avian and mammalian wildlife. No ESL is available for manganese. Dragun and Chiasson (1991) report a range of manganese concentrations in soil within the Eastern United States of less than 2.0 mg/kg to 7,000 mg/kg. Manganese concentrations reported for soil in SWMU 23 (i.e., 257 mg/kg to 1,090 mg/kg) are within the lower end of this range. Concentrations of metals, such as manganese, typically co-vary with other metals, such that environmental management decisions addressing other metals should also address manganese. In addition, there is no evidence of stressed or dead vegetation within the sprayfield of SWMU 23, indicating that the plant community is not adversely affected. Manganese does not bioaccumulate (USEPA 2000f). For these reasons, manganese in SWMU 23 surface soil does not merit further consideration in this ERA.
- *Thallium*. Thallium was only detected in one out of 12 surface soil samples in SWMU 23, at a maximum concentration of 0.58 mg/kg exceeding the ESL. A background concentration for thallium is not available. The maximum thallium concentration, however, does not exceed the Oak Ridge National Laboratory (ORNL) ecological preliminary remediation goal (PRG) (Table 5c). Further, very little information is available to assess the potential toxicity of thallium in soil. Efroymson et al. (1997a,b) identified no primary reference data showing the toxicity of thallium to soil invertebrates or to plants grown in soil. Fischer and Molnar (1997) demonstrated 85 percent mortality in earthworms exposed to approximately 200 mg/kg thallium in soil for seven weeks. Presumably sublethal effects would be observed at lower thallium concentrations, but at the detected concentration of 0.58 mg/kg, certainly thallium may not pose a risk to soil

invertebrates. There is no evidence of stressed or dead vegetation within the sprayfield of SWMU 23, indicating that the plant community is not adversely affected. Additionally, thallium is not considered an important bioaccumulative chemical (USEPA 2000f). For these reasons, thallium in SWMU 23 surface soil is not considered further in this ERA.

Based on the above discussion, no constituents in surface soil within SWMU 23 are considered further in this ERA.

3.1.3 AOI B – Former Process Wastewater Sewer

3.1.3.1 Surface Water

In Section 2.4, the following constituents were identified as preliminary COPECs in surface water for AOI B (see Table 2): benzo(e)pyrene, chrysene, manganese, and mercury. Of these preliminary COPECs, benzo(e)pyrene and chrysene will be further evaluated in Sections 3.2 through 3.5. The remaining constituents are discussed below, considering the availability and basis of criteria, background concentrations, toxicity information, chemical bioaccessibility, bioaccumulation potential, and other factors.

- *Manganese*. There is no Ohio EPA or USEPA screening criteria for manganese in surface water. However, a screening value is available from the MDEQ. Using the mean site-specific (i.e., AOI B only) hardness of 225 mg/L as $CaCO_3$, an MDEQ FCV for manganese can be calculated as 3.9 mg/L. This screening value is more than an order of magnitude higher than the maximum detected manganese concentration (i.e., 0.103 mg/L) in AOI B surface water. Therefore, manganese does not merit further evaluation in AOI B surface water.
- *Mercury*. The maximum total mercury concentration in surface water from AOI B exceeds the Ohio EPA water quality criteria. However, dissolved mercury concentrations do not exceed Ohio EPA criteria (see dissolved metals discussion in Section 3.1). Therefore, mercury in surface water is considered unlikely to adversely affect aquatic organisms within AOI B and is not considered further in this ERA.

Based on the above discussion, the cumulative effect of PAHs in surface water to aquatic organisms (e.g., fish) within AOI B, as well as the potential effects to aquatic-feeding wildlife, are considered in Sections 3.2 through 3.5 of this ERA.

3.1.3.2 Sediment

In Section 2.4, the following constituents were identified as preliminary COPECs in sediment for AOI B (see Table 3a): acetone, several PAHs, biphenyl, beryllium, vanadium, and zinc. Of these preliminary COPECs, PAHs and zinc will be further evaluated in Sections 3.2 through 3.5. The remaining constituents are discussed below, considering the availability and basis of criteria, background concentrations, toxicity information, chemical bioaccessibility, bioaccumulation potential, and other factors.

- *Acetone*. As discussed above, acetone is a common laboratory contaminant. Acetone was detected in only one of six sediment samples collected from AOI B at a maximum concentration that slightly exceeds the ESL (i.e., HQ=1.1). However, an appropriate SQB for acetone, based on the water quality benchmark of 1.7 mg/L or the water ESL, a log Kow of -0.24, and an average AOI B-specific organic carbon (1.81 percent) and solids

(61.9 percent) content, is calculated as 1.1 mg/kg (Table 6). The maximum acetone concentration in AOI B sediment is an order of magnitude lower than this benchmark. Acetone is strongly hydrophilic and exhibits virtually no bioaccumulation potential. For these reasons, acetone is not expected to pose a significant ecological risk and does not merit further evaluation in AOI B sediment.

- *Beryllium*. A sediment screening value is not available for beryllium. However, an Ohio EPA (2003) SRV of 0.80 mg/kg is available for beryllium, based on a state-wide evaluation. The maximum detected beryllium concentration in sediment (i.e., 0.19 mg/kg) does not exceed this benchmark. Beryllium does not bioaccumulate. Therefore, beryllium does not merit further evaluation in AOI B sediment.
- *Vanadium.* A sediment screening value is not available for vanadium. However, an Ohio EPA (2003) SRV of 40 mg/kg is available for vanadium, based on a state-wide evaluation. The maximum detected vanadium concentration in AOI B sediment (i.e., 13.5 mg/kg) does not exceed this benchmark. Vanadium does not bioaccumulate. Therefore, vanadium does not merit further investigation in AOI B sediment.

Based on the above discussion, the cumulative effects of PAHs and metals (i.e., zinc) in sediment to benthic invertebrates within AOI B, as well as the potential effects to aquatic-feeding wildlife, are considered in Sections 3.2 through 3.5 of this ERA. No screening value exists for biphenyl. Therefore, in this ERA, the evaluation of PAHs will address any potential adverse effects of biphenyl.

3.1.3.3 Sediment Porewater

In Section 2.4, the following constituents were identified as preliminary COPECs in sediment porewater for AOI B (see Table 4): aluminum, iron, and manganese. These constituents are discussed below, considering the availability and basis of criteria, background concentrations, toxicity information, chemical bioaccessibility, bioaccumulation potential, and other factors.

- *Aluminum*. The maximum total and dissolved aluminum concentrations in sediment porewater from AOI B exceed the USEPA's chronic criterion of 87 µg/L; no other screening criteria exist for aluminum in water. As discussed above, however, the criteria document (USEPA 1988) states that "EPA is aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg aluminum/L, when either total recoverable or dissolved is measured." Furthermore, the USEPA lowered the water quality criteria for aluminum to be protective of the most sensitive aquatic species (i.e., brook trout and striped bass; USEPA 1988). Benthic invertebrates are less sensitive than fish species, particularly salmonids. For these reasons, aluminum in sediment porewater is considered unlikely to adversely affect benthic organisms within AOI B and is not considered further in this ERA.
- *Iron:* The maximum concentration of total iron in AOI B porewater exceeds the USEPA's ambient water quality criterion of 1.0 mg/L. However, dissolved iron concentrations do not exceed USEPA's criteria (see dissolved metals discussion in Section 3.1). Therefore, iron in porewater is considered unlikely to adversely affect benthic aquatic organisms within AOI B and is not considered further in this ERA.
- *Manganese*. There is no Ohio EPA or USEPA screening criteria for manganese in surface water. However, a screening value is available from the MDEQ. Using the mean site-

specific (i.e., AOI B only) surface water hardness of 225 mg/L as $CaCO_3$, an MDEQ FCV for manganese can be calculated as 3.9 mg/L. This screening value is an order of magnitude higher than the maximum detected manganese concentration (i.e., 0.35 mg/L) in AOI B surface water. Therefore, manganese does not merit further evaluation in AOI B sediment porewater water.

Based on the above discussion, no constituents in sediment porewater within AOI B are considered further in this ERA.

3.1.4 AOI C – Historical Debris Area

3.1.4.1 Surface Water

In Section 2.4, the following constituents were identified as preliminary COPECs in surface water for AOI C (see Table 2): aluminum, iron, and manganese. These constituents are discussed below, considering the availability and basis of criteria, background concentrations, toxicity information, chemical bioaccessibility, bioaccumulation potential, and other factors.

- *Aluminum*. The maximum total aluminum concentration in surface water from AOI C exceeds the USEPA's chronic criterion of 87 µg/L; no other screening criteria exist for aluminum in surface water. As discussed above, however, the criteria document (USEPA 1988) states that "EPA is aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg aluminum/L, when either total recoverable or dissolved is measured." Furthermore, the USEPA lowered the water quality criteria for aluminum to be protective of the most sensitive aquatic species (i.e., brook trout and striped bass; USEPA 1988). The small, shallow ponds in AOI C are not sufficient to not support fish species, particularly not salmonids or striped bass. In addition, dissolved aluminum was not detected (see dissolved metals discussion in Section 3.1). For these reasons, aluminum in surface water is considered unlikely to adversely affect aquatic organisms within AOI C and is not considered further in this ERA.
- *Iron:* The maximum concentrations of total and dissolved iron in AOI C surface water exceed the USEPA's ambient water quality criterion of 1.0 mg/L. As described by USEPA (1986), iron can be present in a variety of chemical forms, some of which have little effect on aquatic life. The most toxic form of iron, bivalent or ferrous iron, is found in waters devoid of oxygen (such as groundwater). Trivalent or ferric iron is practically insoluble in water and has the potential to harm aquatic life largely through the formation of an orange precipitate, which can have a smothering effect. Iron precipitate was not noted in the study area during sampling. Other forms of iron can be present in surface water at relatively high concentrations without affecting aquatic life. Thus, iron does not merit further evaluation in the AOI C surface water.
- *Manganese*. There is no Ohio EPA or USEPA screening criteria for manganese in surface water. However, a screening value is available from the MDEQ. Using the mean site-specific (i.e., AOI C only) hardness of 455 mg/L as $CaCO_3$, an MDEQ FCV for manganese can be calculated as 7.3 mg/L. This screening value is more than 25 times higher than the maximum detected manganese concentration (i.e., 0.29 mg/L) in AOI C surface water. Therefore, manganese does not merit further evaluation in AOI C surface water.

Following this discussion, no constituents in surface water within AOI C are considered further in this ERA.

3.1.4.2 Sediment

In Section 2.4, the following constituents were identified as preliminary COPECs in sediment for AOI C (see Table 3a): acetone, several PAHs, biphenyl, beryllium, cadmium, copper, lead, selenium, vanadium, and zinc. Of these preliminary COPECs, PAHs, cadmium, copper, and lead will be further evaluated in Sections 3.2 through 3.5. The remaining constituents are discussed below, considering the availability and basis of criteria, background concentrations, toxicity information, chemical bioaccessibility, bioaccumulation potential, and other factors.

- *Acetone*. As discussed above, acetone is a common laboratory contaminant. Acetone was detected in four out of seven sediment samples collected from AOI C at a maximum concentration that exceeds the ESL. However, an appropriate SQB for acetone, based on the water quality benchmark of 1.7 mg/L or the water ESL, a log Kow of -0.24, and an average AOI C-specific organic carbon (12.3 percent) and solids (29.3 percent) content, is calculated as 4.2 mg/kg (Table 6). The maximum acetone concentration in AOI C sediment is significantly lower than this benchmark. Acetone is strongly hydrophilic and exhibits virtually no bioaccumulation potential. For these reasons, acetone is not expected to pose a significant ecological risk and does not merit further evaluation in AOI C sediment.
- *Beryllium*. A sediment screening value is not available for beryllium. However, an Ohio EPA (2003) SRV of 0.80 mg/kg is available for beryllium, based on a state-wide evaluation. The maximum detected beryllium concentration in sediment (i.e., 0.70 mg/kg) does not exceed this benchmark. Beryllium does not bioaccumulate. Therefore, beryllium does not merit further evaluation in AOI C sediment.
- *Selenium*. Selenium was detected in sediment samples from AOI C at a maximum concentration that exceeds the Ohio SRV. No other ecological criteria are available for selenium. Although selenium toxicity to fish and birds has been extensively studied, little is known about the toxicity of selenium to benthic invertebrates. However, Stemmer et al. (1990) used selenium in an evaluation of various sediment spiking and toxicity testing methods with the crustacean *Daphnia magna*. When the spiked sediment was allowed to equilibrate for a week or more, LC50s (i.e., concentrations in which 50 percent of the test organisms died) were generally on the order of 100 to greater than 300 mg selenium per liter wet sediment. Using a wet bulk density of 2 kg/L for sediment (conservative assumption) and an average AOI C-specific downstream solids content of 29.3 percent, this equates to approximately 60 to 200 mg/kg dry weight. While these values are approximate, they suggest that selenium toxicity to benthic invertebrates would be expected at concentrations considerably higher than those observed in AOI C sediment. Therefore, selenium does not merit further evaluation in AOI C sediment with respect to benthic invertebrates. However, as part of the conservative assessment of food web risks, selenium is further evaluated for potential effects to aquatic-feeding wildlife.
- *Vanadium.* A sediment screening value is not available for vanadium. However, an Ohio EPA (2003) SRV of 40 mg/kg is available for vanadium, based on a state-wide evaluation. The maximum detected vanadium concentration in AOI C sediment (i.e., 27.8 mg/kg) does not exceed this benchmark. Vanadium does not bioaccumulate. Therefore, vanadium does not merit further investigation in AOI C sediment.

- *Zinc*. The maximum zinc concentration in sediment from AOI C exceeds the Ohio SRV. However, this concentration does not exceed the USEPA ESL (Table 3b). As discussed in Section 2.3, ESLs are designed to be highly conservative and protective of aquatic-feeding wildlife (i.e., considering bioaccumulation) as well as benthic organisms and fish. Therefore, zinc does not merit further consideration in AOI C sediment.

Based on the above discussion, the cumulative effects of PAHs and metals (i.e., cadmium, copper, and lead) in sediment to benthic invertebrates within AOI C, as well as the potential effects of PAHs and metals (i.e., cadmium, copper, lead, and selenium) to aquatic-feeding wildlife, are considered in Sections 3.3 and 3.4 of this ERA. No screening value exists for biphenyl. Therefore, in this ERA, the evaluation of PAHs will address any potential adverse effects of biphenyl.

3.1.4.3 Surface Soil

AOI C includes both aquatic and terrestrial habitat. Therefore, information on surface soil samples collected in the vicinity of the pond area within AOI C is included in this evaluation. In Section 2.4, the following constituents were identified as preliminary COPECs in surface soil for AOI C (see Table 5a): aluminum, cadmium, chromium, copper, iron, lead, mercury, selenium, vanadium, and zinc. Maximum detected concentrations of cadmium, chromium, iron, and vanadium are less than the respective background concentrations and are not considered further in this ERA for AOI C surface soil (see Table 5b). The remaining constituents are discussed below, considering the availability and basis of criteria, background concentrations, toxicity information, chemical bioaccessibility, bioaccumulation potential, and other factors.

- *Aluminum*. A screening value is not available for aluminum in soil. As discussed above, aluminum is the most commonly occurring metallic element, comprising 8 percent of the earth's crust (USEPA 2000e). The typical range of aluminum in soils is from 1-30 percent. Aluminum concentrations in AOI C surface soil range from 4,850 mg/kg to 7,910 mg/kg. Shacklette and Boerngen (1984) report a range of 7,000 to 100,000 mg/kg for soils of the eastern United States (east of 96th meridian). Aluminum concentrations reported for AOI C soil are well below the range reported by Shacklette and Boerngen (1984). Aluminum does not bioaccumulate (USEPA 2000f). For these reasons, aluminum does not merit further evaluation in AOI C surface soil.
- *Copper*. Two out of six detected copper concentrations in AOI C surface soil (31.7 mg/kg and 34.9 mg/kg) only slightly exceed the background concentration (28 mg/kg). The background concentration is more than 5 times higher than the Region 5 ESL for soil (5.4 mg/kg). The maximum copper concentration also only slightly exceeds the Eco-SSL for avian wildlife but does not exceed the Eco-SSLs for terrestrial plants, soil invertebrates, and mammalian wildlife. Therefore, copper does not merit further evaluation in AOI C surface soil for effects to plants, soil invertebrates, and mammalian wildlife. Copper is further evaluated for potential effects to avian terrestrial-feeding wildlife in AOI C.
- *Lead*. The maximum detected lead concentration in AOI C surface soil exceeds background and the Eco-SSLs for avian and mammalian wildlife, but does not exceed the Eco-SSLs for terrestrial plants and soil invertebrates. Therefore, lead does not merit

further evaluation in AOI C surface soil for effects to plants and soil invertebrates. Lead is further evaluated for potential effects to terrestrial-feeding wildlife.

- *Mercury*. The maximum detected mercury concentration in AOI C surface soil (0.17 mg/kg) slightly exceeds the background concentration (0.13 mg/kg) and the Region 5 ESL for soil (0.1 mg/kg). USEPA did not derive Eco-SSLs for mercury. Tipping et al. (2010) derived screening values for mercury of 0.13 mg/kg in bulk soil and 3.3 mg/kg normalized to organic matter (micrograms per gram of organic matter [µg/gOM]), based on toxicity data for plants, soil invertebrates, and microbes. These screening values were derived using a species sensitivity distribution approach and are intended to be protective of 95 percent of all soil organisms. The authors considered the organic matter-normalized screening value more diagnostic, because it accounts for an important soil property affecting mercury bioavailability. Only 1 of 6 soil samples from AOI C contained mercury at a concentration greater than 0.13 mg/kg. Organic carbon information is not available for AOI C soil, so it is uncertain whether the organic matter-normalized concentration would exceed the screening value recommended by Tipping et al. (2010). Because the mercury concentration at only one location in AOI C slightly exceeds the derived screening value (and the background concentration), mercury does not merit further consideration in AOI C soil for terrestrial plants and invertebrates. However, mercury is conservatively evaluated for potential effects to avian and mammalian terrestrial-feeding wildlife in AOI C.
- *Selenium*. The maximum detected selenium concentration in AOI C surface soil exceeds background and the Eco-SSL for terrestrial plants and both avian and mammalian wildlife, but does not exceed the Eco-SSL for soil invertebrates. Therefore, selenium does not merit further evaluation in AOI C surface soil for effects to soil invertebrates. In addition, there is no evidence of stressed or dead vegetation within AOI C, indicating that the plant community is not adversely affected. Therefore, selenium is further evaluated for potential effects to avian and mammalian terrestrial-feeding wildlife.
- *Zinc.* The maximum detected concentration of zinc in surface soil exceeds background and the Eco-SSLs for avian and mammalian wildlife, but does not exceed any other Eco-SSL criteria. Therefore, zinc does not merit further consideration in this ERA for terrestrial plants and soil invertebrates. Zinc is evaluated in this ERA for potential effects to avian and mammalian terrestrial-feeding wildlife in AOI C.

Based on the above evaluation, the potential effects of copper, lead, mercury, selenium, and zinc to terrestrial-feeding wildlife are considered in Sections 3.3 and 3.4 of this ERA.

3.2 Refined Assessment and Measurement Endpoints

The following assessment endpoints were identified in the SLERA:

- Maintenance of the current functioning level of benthic invertebrate community structure in SWMU 22, AOI B, and AOI C;
- Maintenance of the current functioning level of fish community structure in AOI B;
- Maintenance of the current survival and reproduction level of the aquatic-feeding bird and mammal populations in SWMU 22 (birds only), AOI B, and AOI C; and

- Maintenance of the current survival and reproduction level of the terrestrial-feeding bird and mammal populations in SWMU 23 and AOI C.

No constituents were identified in SWMU 23 surface soil that required further evaluation. Therefore, the assessment endpoints for the BERA are modified as follows:

- Maintenance of the current functioning level of benthic invertebrate community structure in SWMU 22, AOI B, and AOI C;
- Maintenance of the current functioning level of fish community structure in AOI B;
- Maintenance of the current survival and reproduction level of aquatic-feeding bird and mammal populations in SWMU 22 (birds only), AOI B, and AOI C; and
- Maintenance of the current survival and reproduction level of terrestrial-feeding bird and mammal populations in AOI C.

When progressing through the ERA process, it is common to add or enhance the process with the addition of measurement endpoints (USEPA 1997, 1998). The SLERA involved the simple ratio (HQ) comparison of maximum concentrations to conservative screening benchmarks, and the refinement of COPECs (Section 3.1) also involved a ratio comparison, albeit using more applicable benchmarks. The remainder of this ERA involves consideration of additional measurement endpoints to further evaluate conditions for the identified assessment endpoints.

3.2.1 Benthic Invertebrate Community Structure and Function

Potential impacts to benthic invertebrates due to PAH and metals mixtures is considered using the equilibrium partitioning approach designed to take into account the evaluation of additive effects of chemical mixtures (USEPA 2003c, 2005b).

3.2.2 Fish Community Structure and Function

Similar to benthic invertebrates, potential impacts to fish due to PAH mixtures is considered using the equilibrium partitioning approach.

3.2.3 Survival and Reproduction of Bird and Mammal Populations

Food web modeling is the measurement endpoint used to evaluate the survival and reproduction of aquatic- and terrestrial-feeding bird and mammal populations. Food web modeling involves the estimation of chemical uptake *via* dietary ingestion, taking into account the bioaccumulation of constituents in dietary prey. Food web modeling cannot be feasibly conducted for all species that might be present within the study area; therefore, ROIs are those selected to represent the range of species that could be exposed. The following ROIs are included in the food web modeling:

- Mallard (*Anas platyrhynchos*). Mallards are an ROI representing the omnivorous bird feeding guild for aquatic systems (USEPA 1993b). Mallards are among the more common species in this feeding guild and have been observed within the study area. Given their tolerance for a broad range of habitats, either wintering or breeding populations are expected to use the study area. Exposure of mallards to constituents may be enhanced by their foraging strategy, “dabbling,” in which they stir up sediment with their bills in an effort to locate prey. Incidental sediment ingestion may occur as a result.

- Raccoon (*Procyon lotor*). Raccoons represent the feeding guild of omnivorous mammals. The raccoon has been reported to be the most abundant and widespread medium-sized omnivore in North America (USEPA 1993b) and has been observed within the study area. Raccoons also tend to be more closely associated with aquatic systems than other mammalian omnivores, although they feed opportunistically from both aquatic and terrestrial sources. Raccoons are common in urban, suburban, and agricultural areas, such as those bordering the study area.
- Great blue heron *(Ardea herodias)*. Great blue herons are evaluated as a representative of the feeding guild of piscivorous birds. Great blue herons consume fish up to 300 millimeters (mm) in length. Great blue herons nest in colonies, usually building prominent nests in standing dead snags in still waterbodies. No such colonies have been observed within the study area, likely due to habitat constraints, as well as the presence of more secluded nesting areas elsewhere near the Little Miami River. Given that great blue herons likely do not breed in the study area, any individuals that might forage there are likely transitory and obtain food from multiple sources, in addition to the study area.
- American robin (*Turdus migratorius*). As an insectivorous bird, the American robin primarily feeds on worms and other terrestrial invertebrates. Robins supplement their diet with seeds and fruit, when available (Wheelwright 1986). They are common throughout the United States during the breeding season (that is, spring, summer, and fall) and inhabit moist forests, swamps, and open woodland (USEPA 1993).
- Short-tailed shrew (*Blarina brevicauda*). Short-tailed shrews represent the insectivorous mammal feeding guild. Short-tailed shrews feed primarily on earthworms, although they will occasionally prey on small mammals (for example, meadow voles) if invertebrates are unavailable (USEPA 1993b). Shrews prefer cool, moist locations (Randolph 1973).
- Red-tailed hawk *(Buteo jamaicensis)*. As a top predator in the carnivorous bird feeding guild, red-tailed hawks consume rodents and other small mammals. It is likely that a red-tailed hawk would include the study area in its territory given that: (a) their foraging habitat preference is wetlands, woodlands, and streamside locations; (b) prey items are present within the study area; and (c) home ranges for red-tailed hawks can reach up to 1,700 hectares (USEPA 1993b). A red-tailed hawk was observed flying above SWMU 23 in July 2008.
- Red fox (*Vulpes vulpes*). The mammalian top-level predator is represented by the red fox. They are the most widely distributed carnivore in the world. Red foxes prefer broken, varied uplands habitat, such as agricultural areas (USEPA 1993b). The diet of the red fox is based on food availability, and thus varies throughout the year. They feed primarily on mice and other small mammals, but they also eat fruits, berries, seeds, and nuts.

3.3 Refined Exposure Estimates

The following sections support the refined exposure assessment for benthic invertebrates, fish, and wildlife. The evaluation of PAHs and metals considers cumulative toxicity to benthic invertebrates (Section 3.3.1) and fish (Section 3.3.2). Preliminary COPECs identified by the

USEPA (2000f) as bioaccumulative are evaluated for their potential effects to aquatic-feeding wildlife (Section 3.3.3).

3.3.1 Benthic Invertebrates

Based on the relatively low mobility of benthic invertebrates, each sediment sample is treated as an exposure unit in this ERA. The significance of risks associated with individual samples, if any, is evaluated on the magnitude and spatial extent of risks across the study area.

In September 2008, several surface water and sediment samples were analyzed for alkylated PAHs, and several sediment samples were analyzed for AVS, simultaneously extracted metals (SEM), and total organic carbon (TOC). These data are included in this ERA to evaluate potential effects of PAHs and the mixture of cadmium, copper, lead, nickel, silver, and zinc in sediment to benthic invertebrates.

3.3.1.1 PAHs

The evaluation of the potential for adverse effects of PAHs to benthic invertebrates includes a cumulative assessment of these compounds in sediment on a sample-specific basis. It is appropriate to evaluate individual PAH compounds cumulatively, since these groups of constituents have similar effects on biological organisms. The sample-specific concentration of organic carbon in sediment provides sufficient information to interpret exposures to benthic invertebrates based on whole-sediment PAH concentrations (USEPA 2003c).

In order to facilitate the refined risk characterization for effects of PAHs on benthic invertebrates, both unsubstituted and alkylated PAHs were analyzed in sediment samples collected in September 2008. PAHs are a large class of organic compounds that include unsubstituted compounds as well as those with alkyl, oxygen, or nitrogen substituents. For example, naphthalene is an unsubstituted (or “parent”) PAH, and 2-methylnaphthalene is an alkylated PAH. Naphthalene compounds with a single methyl group, regardless of its position, are collectively referred to as C1-naphthalenes, while C2-naphthalenes have two methyl groups or one ethyl group, and C3-naphthalenes have three carbons attached to the parent ring structure (for example, three methyl groups).

3.3.1.2 Metals

The USEPA (2005b) has developed recommendations for assessing the risk of sediment toxicity due to mixtures of divalent metals like cadmium, copper, lead, nickel, silver and zinc based on an understanding of the primary factors controlling the concentrations of these metals in sediment porewater. Extensive evidence has shown that chemical bioavailability can differ dramatically among different types of sediment, with chemical concentrations in porewater showing a much closer relationship with toxicity than dry-weight whole-sediment concentrations (Ankley et al. 1996; Di Toro et al. 1991; USEPA 2000b,c,d). The most important such factor is the concentration of AVS present in the sample. The organic carbon content is recognized as the key factor controlling the partitioning (and thus the bioavailability) of hydrophobic organic constituents in sediment and also plays a secondary role in metals availability. Together with TOC, AVS and SEM concentrations provide an estimate of the bioavailable (that is, available for uptake by organisms) concentrations of mixtures of these metals (USEPA 2000c, 2005b).

3.3.2 Fish

Similar to the evaluation of the potential effects of PAHs to benthic invertebrates (Section 3.3.1.1), the potential effects of PAHs on fish can be evaluated with a cumulative assessment of these compounds on a sample-specific basis. However, unlike the evaluation of PAHs for benthic invertebrates, TOC is not a controlling factor in surface water toxicity of PAHs (USEPA 2003c). Only those samples with at least one detected PAH compound are considered in this evaluation.

3.3.3 Wildlife

For wildlife, PAHs and several metals are the identified preliminary COPECs that have the potential to bioaccumulate, based on their log Kow values and in accordance with USEPA guidance (2000f). Wildlife exposures are evaluated cumulatively for two groups of PAHs: low molecular weight PAHs (LPAHs) and high molecular weight PAHs (HPAHs). The distinction between LPAHs and HPAHs is useful because these groups of PAHs exhibit different degrees of toxicity to wildlife. The LPAHs include acenaphthene, acenaphthylene, anthracene, fluorene, naphthalene, phenanthrene, and alkylated homologues of these PAHs. The HPAHs include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(e)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, perylene, pyrene, and alkylated homologues of these PAHs.

Because dietary exposures to bioaccumulative compounds dominate wildlife exposures and potential risks (Moore et al. 1997, 1999), such exposures are the primary focus of this screening level risk characterization for wildlife. Constituents are evaluated for wildlife in this ERA by comparing modeled dietary intake of COPECs by representative avian and mammalian species to doses reported in the literature as thresholds for adverse effects on survival or reproduction.

For each receptor, total daily intake (TDI) was calculated using the generalized equation:

$$TDI = (C \times SIR) + \sum_{i=1}^{n} (Ci \times Pi \times FIR) \times 1/BW \times AUF$$

Where:

TDI = total daily intake (milligram per kilogram body weight per day or mg/kg-day)

C = concentration in sediment or surface soil (mg/kg)

SIR = sediment or soil ingestion rate (kilogram per day or kg/day)

Ci = concentration in each dietary item (mg/kg)

Pi = fraction of diet as item i (unitless)

FIR = food ingestion rate (kg/day)

BW = body weight (kilogram or kg)

AUF = area use factor (unitless)

Since a majority of the constituents considered in the wildlife evaluation were not detected in surface water, incidental surface water ingestion was considered negligible. On the other hand, incidental sediment and prey ingestion contribute significantly to wildlife exposure. Therefore, an evaluation of sediment and prey ingestion for wildlife will also address any potential risks posed by surface water.

Concentrations of COPECs in the diet (Ci) of each receptor were estimated using bioaccumulation factors (BAFs) derived from the literature. In particular, maximum concentrations of each chemical in sediment and/or soil, as appropriate, were multiplied by applicable BAFs in order to estimate the concentrations in appropriate prey items. The estimated prey concentrations are adjusted to represent wet weight concentrations from dry weight sediment or soil data, assuming a moisture content of 80 percent in biota tissue (Boese and Lee 1992). The selected BAFs and the resultant estimated exposure point concentrations (EPCs) are tabulated in Table 7.

Pertinent information regarding prey preferences, body weight, and foraging range for all wildlife receptors was drawn from USEPA's (1993b) *Wildlife Exposure Factors Handbook*. Area use factors (AUFs) are applied when the foraging area of a wildlife ROI is larger than the area being assessed. In this ERA, AUFs are calculated based on the individual areas being assessed (i.e., SWMU 22, AOI B, and AOI C) and the home range for each receptor. With the exception of the American robin and short-tailed shrew which have smaller home range sizes, the AUFs calculated for the remaining ROIs and areas range from 0.0003 to 0.09. Therefore, an AUF of 0.1 is conservatively applied in this evaluation for all receptors except the robin and shrew. This means that receptors are assumed to obtain 10 percent of their diet from an AOI. For the robin and shrew, home range sizes are smaller relative to the area of AOI C. Therefore, an AUF of 1.0 is applied in this evaluation for the robin and shrew in AOI C. This is a very conservative assumption that the robin and shrew would obtain 100 percent of their diet from AOI C. Exposure assumptions for avian and mammalian receptors are presented in Tables 8 through 11. The basis for key assumptions listed in those tables is further explained below.

Ingestion rates for sediment and/or soil were obtained from Beyer et al. (1994). Beyer et al. (1994) presents rates of combined sediment and soil ingestion as a percentage of ingested food, on a dry weight basis. For this ERA, COPEC concentrations and ingestion rates for sediment and soil are presented on a dry weight basis, but for wildlife food items these parameters are presented on a wet weight basis. Therefore, for the purpose of calculating sediment and soil ingestion rates, food ingestion rates are multiplied by a wet to dry weight conversion factor of 0.2 prior to applying the sediment and soil intake rates developed by Beyer et al. (1994). For AOI C, most ROIs feed on prey items from both aquatic and terrestrial sources. The sediment/soil ingestion rate is applied in proportion to the percentage of aquatic and terrestrial prey items for each ROI.

Empirical data on food ingestion rate (FIR) are available for only few species, primarily due to the difficulty of measuring feeding rates for free-ranging wildlife. Measured food intake rates for captive animals are not used in this ERA, because such animals do not expend energy foraging for food and water, avoiding predators, defending territories, etc. (USEPA 1993b). Therefore, in the absence of empirical data on FIR in free-ranging animals, FIR was calculated from allometric equations developed from the free metabolic rate (FMR) of free-ranging animal, as described in USEPA (1993b) and shown in the following equations:

$$FIR = NIR_{total} \times BW \times 0.001$$

Where:

NIR_{total} = total normalized ingestion rate (grams per kilogram body weight per day or g/kg-day); and

$$NIR_{total} = \frac{NFMR}{\sum (P_k \times ME_k)}$$

Where:

NFMR = normalized free-living metabolic rate of predator (kilocalorie per kilogram body weight per day or kcal/kg-day);

Pk = proportion of diet of kth prey item (unitless); and

MEk = metabolic energy of kth prey item (kilocalorie per gram [kcal/g] wet weight); and

$$ME = GE \times AE$$

Where:

GE = gross energy (kcal/g wet weight)

AE = assimilation efficiency (unitless)

The derivation of FIR values for all wildlife receptors is provided in Table 8. The calculation of TDI for wildlife receptors in SWMU 22, AOI B, and AOI C is shown in Tables 9, 10, and 11, respectively.

3.4 Refined Effects Characterization

The methodologies used to assess ecological exposures in this ERA are discussed below for benthic invertebrates, fish, and wildlife.

3.4.1 Benthic Invertebrates

3.4.1.1 PAHs

The likelihood of sediment toxicity due to PAHs is evaluated according to the USEPA's sediment guidelines for PAH mixtures (USEPA 2003c). Although several PAHs were not detected, and the detected concentrations of several PAHs in sediment are below screening criteria (see Table 3a), the USEPA guidelines evaluate all PAHs cumulatively. These guidelines incorporate FCVs for individual PAHs, which are used to assess the additive toxicity of PAH mixtures. The FCVs were derived using the equilibrium partitioning approach and have been validated using spiked sediment toxicity studies and evaluations of sediment toxicity at sites contaminated with PAHs (USEPA 2003c; Di Toro and McGrath 2000). As described by Di Toro et al. (1991), the equilibrium partitioning approach uses the chemical-specific partition coefficient between water and organic carbon and the mass fraction of organic carbon in sediment to calculate SQBs as follows:

$$SQB = WQB \times Koc \times foc$$

Where:

WQB = water quality benchmark, or FCV, in mg/L

Koc = chemical-specific organic carbon-water partition coefficient

foc = sediment-specific fraction organic carbon

The FCVs are applied to PAH mixtures through the calculation of toxic unit (TU) values for each sediment sample. The TU for a PAH mixture is calculated as the sum of each PAH concentration divided by the respective FCV:

$$TU = \frac{[PAH_1]}{FCV_1} + \frac{[PAH_2]}{FCV_2} + \ldots + \frac{[PAH_n]}{FCV_n}$$

The USEPA (2003c) guidelines are based on the measurement of 34 PAHs, including alkylated and parent compounds. When fewer PAHs are measured, a conservative adjustment factor is used to account for unmeasured PAHs. Sediment samples evaluated in this ERA were analyzed for the 34 PAH compounds; therefore, no adjustment factor is necessary. Toxicity is considered possible if the TU for a PAH mixture exceeds 1.0 (USEPA 2003c).

3.4.1.2 Metals

The USEPA (2005b) guidelines for mixtures of cadmium, copper, lead, nickel, silver, and zinc are based on an understanding of the primary factors controlling the concentrations of these metals in sediment porewater (i.e., bioavailability). One key factor is the concentration of sulfide, measured as AVS. The metals listed above form insoluble complexes with sulfide. Thus, if the concentration of AVS is greater than the concentration of SEM in sediment on a molar basis, the metals are not present in the porewater and do not cause toxicity (Ankley et al. 1996; USEPA 2005b). This premise has been shown to hold true in toxicity tests of sediments collected from sites contaminated primarily with metals (Hansen et al. 1996).

A recent refinement of the SEM – AVS approach addresses the role of TOC as a secondary factor controlling the bioavailability of these metals, in sediments where SEM concentrations exceed the concentrations of AVS. As described by USEPA (2005b), one can predict with 90 percent confidence that sediment toxicity will not occur if the organic-carbon normalized concentration of “excess” metals ([ΣSEM-AVS]/foc) is less than 130 micromoles per gram organic carbon (µmol/gOC). Similarly, sediment toxicity is expected with 90 percent confidence if (ΣSEM-AVS)/foc exceeds 3,000 µmol/gOC. The likelihood of toxicity associated with intermediate values is uncertain. For the purposes of this ERA, the effects benchmark for (ΣSEM-AVS)/foc is conservatively identified as 130 µmol/gOC.

3.4.2 Fish

As part of the derivation of sediment quality guidelines for PAHs, the USEPA (2003c) developed aqueous FCVs for PAHs. These FCVs are applied to PAH mixtures in surface water using the same TU methodology described in Section 3.4.1.1 for PAHs in sediment. A USEPA-sponsored evaluation indicates that the equilibrium partitioning guidelines developed for the protection of benthic invertebrates (USEPA 2003c) are protective of fish as well (Linton et al. 2000). Surface water samples evaluated in this ERA were analyzed for the 34 PAH compounds; therefore, no adjustment factor is necessary. Similar to sediment, toxicity is considered possible if the TU for a PAH mixture in surface water exceeds 1.0 (USEPA 2003c).

3.4.3 Wildlife

Toxicity reference values (TRVs) are the measures of effects used to evaluate responses of wildlife receptors to COPECs. A variety of approaches are available for deriving TRVs, including regression analyses, toxicity testing, application of extrapolation and uncertainty factors, probabilistic analyses, and others. TRVs in this BERA were derived based on the general methodology of Sample et al. (1996) and Sample and Arenal (1999), by applying extrapolation factors (EFs) and uncertainty factors (UFs) to laboratory study results, as detailed below:

$$TRV = \frac{Test\ Species\ Dose \times BodyWeight\ EF}{DurationUF \times EndpointUF}$$

The test species dose is a daily dose of a chemical associated with a particular endpoint and effect. Test species doses were identified from appropriate literature references. The following criteria are applied in selecting applicable studies:

- *Relatedness of test species* used in the study as compared to the wildlife species of interest. Studies on species that are similar with respect to taxonomic order and/or feeding guild are preferred over studies on species that are less closely related. In addition, studies on wild species are preferred over studies on domesticated species.
- *Effects evaluated*. Studies focused on most sensitive effects are preferred over studies on less sensitive effects. Thus, sublethal studies are preferred over lethal studies and studies on sensitive life stages are preferred over studies on adult non-breeding organisms.
- *Type of endpoint*. Studies with multiple dose groups that allow identification of a no observed adverse effect level (NOAEL) are preferred over studies that yield fewer or different endpoints.
- *Duration of the dosing period*. Lifetime or chronic duration studies are preferred over subchronic, acute, and single dose studies.

- *Dose administration method*. Studies utilizing dietary dosing are preferred over other oral dosing methods, which are preferred over injection, dermal, or inhalation dose administration.
- *Documentation of study methods and quality control*. Studies that clearly document the study design and methods and that demonstrate adequate quality control are preferred over those that provide limited discussion on these topics.

NOAELs are commonly reported endpoints that may be considered in the selection of the test species dose; they are generally most appropriate for use in calculating screening HQs, because SLERAs are intentionally and inherently conservative. Alternative metrics – such as the lowest observed adverse effect level (LOAEL), the concentration affecting 20 percent of the population (EC20), and species sensitivity distributions – are more appropriate for BERAs, where the goal is to predict risks as accurately as possible.

NOAELs and LOAELS used in TRV derivation are reported on—or converted to—a mg COPEC/kg body weight/day (mg/kg-day) basis. These dose units allow comparisons among organisms of different body sizes (Sample et al. 1996). In cases where the critical study states the lowest effect level as a dietary concentration (i.e., in units of mg COPEC/kg food), the test species dose is calculated as:

$$Dose = \frac{C \times FIR}{BW}$$

Where:

Dose = test species dose of COPEC (mg/kg-day)

C = concentration of COPEC in food (mg/kg)

FIR = food ingestion rate of food or water by the test species (kg/day)

BW = body weight of the test species (kg)

EFs and UFs are typically identified based on three characteristics of the experimental conditions associated with the test species dose: (1) the duration of exposure; (2) the endpoint measured; and (3) differences in body weight among test and receptor species (Calabrese and Baldwin 1993, Ford et al. 1992, Opresko et al. 1994, Sample and Arenal 1999, Sample et al. 1996, USEPA 1996, Watkin and Stelljes 1993, Wentsel et al. 1994). In some cases where only a NOAEL or LOAEL resulted from the critical study, it is assumed that the LOAEL is 10-fold higher than the NOAEL. In cases where the only available studies are based on endpoints that are generally less sensitive than reproduction (e.g. lethality), a 10-fold endpoint UF is applied. Otherwise, it was not necessary to employ UFs in this ERA.

Table 12 and Table 13 summarize the selected NOAEL and LOAEL TRVs, respectively, for wildlife receptors. NOAEL TRVs represent the reasonable worse case measure of effect, while the LOAEL TRVs provide a realistic measure of effect. For purposes of this ERA, TRVs are developed for total LPAHs and total HPAHs, rather than for each measured PAH compound. Conservative surrogate values based on data for individual PAHs are identified as mammalian test species doses. These values are expected to overestimate risks due to total PAHs occurring within the study area, because they are based on the most toxic individual PAH compounds.

3.5 Refined Risk Calculations

Potential adverse effects to benthic invertebrates, fish, and wildlife from COPECs in surface water, sediment, and surface soil are evaluated in this section of the assessment.

3.5.1 Benthic Invertebrates

The refined evaluation of PAHs in SWMU 22, AOI B, and AOI C sediment indicates that only benthic organisms at locations SED02 and SED05 within AOI B may be affected by PAHs (Table 14). These locations are shown on Figure 6. However, it does not appear that the PAHs identified in the quarry pond are from site-related releases for the following reasons: (1) the PAHs identified in the quarry pond were not identified at on-site locations above ecological screening levels, and (2) chromium, which was used in site operations and investigated specifically to assess potential impacts of site-related COPECs to this AOI, was not identified in the quarry pond above ecological screening levels. In addition, Martin Marietta is in the process of pursuing a permit to resume operations of the quarry pond that are expected to diminish the ecological diversity and value of the pond, and therefore, the potential for adverse effects associated with detected PAH concentrations in sediments is considered insignificant by comparison.

The AVS-SEM evaluation indicates that toxicity is unlikely for mixtures of cadmium, copper, lead, nickel, silver, and zinc in sediment within SWMU 22 and AOI C (Table 15). To further evaluate the potential risks from the sediment sample collected from AOI B, two additional steps were employed. First, since it is well known that metals with higher binding affinity for sulfide will displace those with lower binding affinity, a sequential subtraction of SEM from the AVS was conducted. The binding affinity of SEM for AVS follows the order: copper> cadmium> lead> zinc> nickel. When the molar concentrations of these metals were sequentially subtracted from the AVS, the only remaining metals that were not accounted for by AVS and could be bioavailable were zinc and nickel. Secondly, the binding affinity of SEM for TOC follows the order: cadmium> copper> nickel> zinc> lead (Mahony et al. 1996; DiToro et al. 2005). Given that the only bioavailable SEMs in this sample were zinc and nickel, the organic carbon (OC)-normalized toxicity threshold for zinc (1,400 µmol/gOC) and nickel (1,100 µmol/gOC) are the appropriate values to determine the risk from this sample. When this comparison is made, the level of OC-normalized zinc and nickel in this sample were far lower than the threshold value for these metals.

3.5.2 Fish

The refined evaluation of PAHs in surface water indicates that toxicity to fish from PAHs in AOI B is unlikely (Table 16). The TUs for all surface water sampling locations do not exceed the screening benchmark of 1.

3.5.3 Wildlife

Screening level HQs are calculated by dividing the estimated dose of a given chemical to each wildlife receptor by the corresponding TRV to yield a HQ. If the value of the HQ is equal to or below 1, doses are predicted to be below levels associated with adverse effects and the constituents are screened out from further analysis. Quotient or HQ values greater than 1 indicate the need for refined investigation to determine whether adverse effects are likely.

Table 12 presents the calculated study area screening-level, or NOAEL, HQs. As the maximum concentrations of each COPEC detected within the selected portion of the study area, conservative AUFs, and NOAEL toxicity values are used in the calculations, these HQs offer a worst-case view of any individual bird's or mammal's exposure. The calculated NOAEL HQs do not exceed 1 for SWMU 22, AOI B, and AOI C. While NOAEL TRVs represent the reasonable worse case measure of effect, LOAEL TRVs provide a realistic measure of effect. Table 13 presents HQ calculations based on LOAEL toxicity values and maximum COPEC concentrations. Similar to the NOAEL HQs, all LOAEL HQs do not exceed 1. Therefore, it is unlikely that constituents pose a risk to aquatic- and terrestrial-feeding wildlife.

3.6 Uncertainty Analysis

Characterization of uncertainty is a necessary component of the ERA process (USEPA 1997). An assessment is designed to provide conservative estimates of the potential risks that may exist and, therefore, incorporates uncertainty in a precautionary manner. Uncertainty in ERA represents "the imperfect knowledge concerning the present or future state of the system under consideration; a component of risk resulting from imperfect knowledge of the degree of hazard, or of its spatial and temporal distribution" (USEPA 1997). Uncertainties that may lead to either overestimation or underestimation of risk are associated with each stage of risk assessment. Table 17 summarizes uncertainties that are associated with an ERA. The uncertainties that exist in the SLERA and Step 3a of this BERA, are consistent with those of any ERA, and are considered more likely to overestimate risks than to underestimate risks.

4. CONCLUSIONS AND RECOMMENDATIONS

The revised ERA used the site characterization data that have been collected during the RFI to assess potential risks to ecological receptors that may be exposed to Site-related constituents in soil, sediment and surface water at and near the Site.

A summary of the findings and the conclusion of the ERA are as follows:

- Threatened and endangered species are not likely present within the study area.
- Several constituents are present in surface water, sediment, and surface soil at concentrations that exceed relevant conservative screening values; exceedances of these criteria indicated that more detailed and focused risk assessment was warranted.
- The potential for complete exposure pathways between potentially site-related constituents and ecological receptors were identified in one AOC investigated during the RFI (AOI B, the off-site quarry pond). Therefore, the BERA focused on the following assessment endpoints where these conditions were identified:
  - Benthic invertebrate community structure and function;
  - Fish community structure and function;
  - Survival and reproduction of aquatic-feeding bird and mammal populations; and
  - Survival and reproduction of terrestrial-feeding bird and mammal populations.
- Step 3a of the BERA included a comprehensive desk-top analysis of available information regarding the above-listed assessment endpoints, using well accepted USEPA equilibrium partitioning, food web modeling, and other appropriate analyses related to refined exposure and effects assumptions for evaluating the potential risks associated with constituents that exceeded screening criteria. Step 3a also considered the additive toxicity of classes of compounds, such as PAHs and metal mixtures.
- The conclusions associated with each of these assessment endpoints were as follows:
  - Benthic invertebrate community structure and function. The overall conclusion regarding the benthic community structure and function is that the only constituent, or class of constituents, that seems to potentially pose a risk to the benthic community are PAHs, and this potential risk is only in isolated portions of the closed quarry pond (AOI B). Specifically, the analysis of additive impacts to benthic invertebrates was performed using USEPA's equilibrium partitioning approach, and those results showed that PAHs could pose a potential impact to benthic diversity in very isolated locations within AOI B. However, it does not appear that the PAHs identified in the quarry pond are from site-related releases. In addition, the owner of the quarry pond (Martin Marietta) is in the process of pursuing a permit to resume operations of the quarry pond. These operations are expected to diminish the ecological diversity and value of the pond, and therefore, the potential for adverse effects associated with detected PAH concentrations in sediments is considered insignificant by comparison.

- Fish community structure and function. The overall conclusion regarding fish community structure and function is that adverse impacts are not likely to occur due to site-related constituents.
- Survival and reproduction of aquatic- and terrestrial-feeding wildlife populations. The overall conclusion regarding survival and reproduction of aquatic- and terrestrial-feeding wildlife is that adverse impacts are not likely to occur due to site-related constituents.

Based on this information, the results are sufficient to conclude that potential releases of hazardous constituents from Bway do not pose ecologically significant impacts to populations, communities, or ecosystems. Therefore, corrective measures are not warranted on the basis of ecological risk.

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TABLES

Table 1. Conceptual Site Model for Ecological Exposures
Bway Corporation, Cincinnati, OH

Receptor Population	Exposure Medium	Exposure Route	Comments
On-Site			
Terrestrial Organisms	surface soil	Ingestion, contact[a]	Habitat within SWMU 23 (land application treatment area/sprayfield) and AOI C (historical debris area) is sufficient to support terrestrial wildlife and exposure to Site-related constituents could occur. The remainder of the Site currently consists of paved parking lots and walkways, office and manufacturing buildings, and landscaped grounds. Landscaping includes grass lawns and perennial shrubbery. These areas offer little ecological amenities.
	surface water	Ingestion, contact[a]	The Process Pond within SWMU 22 is permitted, frequently maintained and monitored, not viable habitat for terrestrial organisms, and engineered to deter ecological use of the area. Habitat within AOI C (historical debris area) is sufficient to support terrestrial wildlife and exposure to Site-related constituents could occur.
	sediment	Ingestion, contact[a]	The Process Pond within SWMU 22 is permitted, frequently maintained and monitored, not viable habitat for terrestrial organisms, and engineered to deter ecological use of the area. Habitat within AOI C (historical debris area) is sufficient to support terrestrial wildlife and incidental exposure to Site-related constituents could occur. This pathway is considered minimal.
	biota tissue	Ingestion, food web	The Process Pond within SWMU 22 is permitted, frequently maintained and monitored, not viable habitat for terrestrial organisms, and engineered to deter ecological use of the area. Habitat within AOI C (historical debris area) is sufficient to support terrestrial wildlife and exposure to Site-related constituents could occur.
Aquatic Organisms	surface water/ sediment	Ingestion, contact	The Process Pond within SWMU 22 is permitted, frequently maintained and monitored, generally not viable habitat for aquatic organisms, and engineered to deter ecological use of the area. Fish have not been observed in the Process Pond. Habitat within AOI C (historical debris area) is sufficient to support aquatic organisms and exposure to Site-related constituents could occur.
	biota tissue	Ingestion, food web	The Process Pond within SWMU 22 is permitted, frequently maintained and monitored, generally not viable habitat for aquatic organisms, and engineered to deter ecological use of the area. Fish have not been observed in the Process Pond. Habitat within AOI C (historical debris area) is sufficient to support aquatic organisms and exposure to Site-related constituents could occur.

Table 1. Conceptual Site Model for Ecological Exposures
Bway Corporation, Cincinnati, OH

Receptor Population	Exposure Medium	Exposure Route	Comments
Aquatic-feeding wildlife	surface water/ sediment	Ingestion, contact[a]	The Process Pond within SWMU 22 is permitted, frequently maintained and monitored, generally not viable habitat for aquatic organisms, and engineered to deter ecological use of the area. Fish have not been observed in the Process Pond. Although the pond is engineered to deter ecological use of the area, waterfowl may transiently utilize the pond. Habitat within AOI C (historical debris area) is sufficient to support aquatic-feeding wildlife and incidental exposure to Site-related constituents could occur.
	biota tissue	Ingestion, food web	The Process Pond within SWMU 22 is permitted, frequently maintained and monitored, generally not viable habitat for aquatic organisms, and engineered to deter ecological use of the area. Fish have not been observed in the Process Pond. Although the pond is engineered to deter ecological use of the area, waterfowl may transiently utilize the pond. Habitat within AOI C (historical debris area) is sufficient to support aquatic-feeding wildlife and incidental exposure to Site-related constituents could occur.

Table 1. Conceptual Site Model for Ecological Exposures
Bway Corporation, Cincinnati, OH

Receptor Population	Exposure Medium	Exposure Route	Comments
Off-Site			
Terrestrial Organisms	surface soil	Ingestion, contact[a]	There is no known off-Site soil contamination.
	surface water	Ingestion, contact[a]	Habitat near the Site (AOI B-quarry pond) is sufficient to support terrestrial wildlife and exposure to Site-related constituents could occur.
	sediment	Ingestion, contact[a]	Habitat near the Site (AOI B-quarry pond) is sufficient to support terrestrial wildlife and exposure to Site-related constituents could occur. This pathway is considered minimal.
	biota tissue	Ingestion, food web	Habitat near the Site (AOI B-quarry pond) is sufficient to support terrestrial wildlife and exposure to Site-related constituents could occur.
Aquatic Organisms	surface water/ sediment	Ingestion, contact	Habitat near the Site (AOI B-quarry pond) is sufficient to support aquatic organisms and exposure to Site-related constituents could occur.
	biota tissue	Ingestion, food web	Habitat near the Site (AOI B-quarry pond) is sufficient to support aquatic organisms and exposure to Site-related constituents could occur.
Aquatic-feeding wildlife	surface water/ sediment	Ingestion, contact[a]	Habitat near the Site (AOI B-quarry pond) is sufficient to support aquatic-feeding wildlife and exposure to Site-related constituents could occur.
	biota tissue	Ingestion, food web	Habitat near the Site (AOI B-quarry pond) is sufficient to support aquatic-feeding wildlife and exposure to Site-related constituents could occur.

a. Dermal contact is considered minimal.
AOI: Area of interest

Table 2. Surface Water Ecological Screening
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Meas Basis	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Surface Water Screening Value[a] (mg/L)		Ratio of Max Detect to SW Screening Value
AOI C	VOC	Acetone	T	6	3	1.20E-03	3.60E-03	1.7E+00	USEPA R5	2.1E-03
AOI C	VOC	2-Butanone	T	6	3	7.90E-04	1.30E-03	2.2E+01	Ohio EPA	5.9E-05
AOI C	VOC	Carbon Disulfide	T	6	2	3.10E-04	1.50E-03	1.5E-02	Ohio EPA	1.0E-01
AOI C	VOC	Toluene	T	6	3	2.50E-04	1.90E-03	6.2E-02	Ohio EPA	3.1E-02
AOI C	VOC	Trichloroethene	T	6	2	2.80E-04	3.30E-04	2.2E-01	Ohio EPA	1.5E-03
AOI C	VOC	Vinyl Chloride	T	6	1	6.80E-04	6.80E-04	9.3E-01	Ohio EPA	7.3E-04
AOI C	SVOC	bis(2-Ethylhexyl)phthalate	T	6	3	1.20E-03	4.10E-03	8.4E-03	Ohio EPA	4.9E-01
AOI C	SVOC	2-Methylphenol	T	6	1	5.30E-03	5.30E-03	6.7E-02	USEPA R5	7.9E-02
AOI C	SVOC	3-Methylphenol	T	6	1	5.10E-03	5.10E-03	6.2E-02	USEPA R5	8.2E-02
AOI C	SVOC	4-Methylphenol	T	6	1	5.10E-03	5.10E-03	2.5E-02	USEPA R5	2.0E-01
AOI C	INORG	Aluminum	T	6	1	8.10E-01	8.10E-01	8.7E-02	FED AWQC	**9.3E+00**
AOI C	INORG	Arsenic	T	6	1	3.60E-03	3.60E-03	1.5E-01	Ohio EPA	2.4E-02
AOI C	INORG	Barium	D	6	6	4.20E-02	8.37E-02	2.2E-01	USEPA R5	3.8E-01
AOI C	INORG	Barium	T	6	6	4.57E-02	8.45E-02	2.2E-01	Ohio EPA	3.8E-01
AOI C	INORG	Chromium III	T	6	1	1.00E-03	1.00E-03	7.4E-02	FED AWQC	1.4E-02
AOI C	INORG	Chromium VI	T	6	1	4.00E-03	4.00E-03	1.1E-02	FED AWQC	3.6E-01
AOI C	INORG	Cobalt	D	6	2	1.80E-03	2.10E-03	2.4E-02	USEPA R5	8.8E-02
AOI C	INORG	Iron	D	6	6	9.42E-02	1.49E+00	1.0E+00	FED AWQC	**1.5E+00**
AOI C	INORG	Iron	T	6	6	2.08E-01	2.40E+00	1.0E+00	FED AWQC	**2.4E+00**
AOI C	INORG	Lead	T	6	1	2.00E-03	2.00E-03	3.7E-02	Ohio EPA	5.3E-02
AOI C	INORG	Manganese	D	6	6	3.97E-02	2.93E-01		NA	
AOI C	INORG	Manganese	T	6	6	3.57E-02	2.95E-01		NA	
AOI C	INORG	Thallium	D	6	1	5.80E-03	5.80E-03	1.0E-02	USEPA R5	5.8E-01
AOI C	INORG	Thallium	T	6	1	5.50E-03	5.50E-03	1.7E-02	Ohio EPA	3.2E-01
AOI C	INORG	Vanadium	T	6	1	1.10E-03	1.10E-03	4.4E-02	Ohio EPA	2.5E-02
AOI C	INORG	Zinc	D	6	1	1.00E-02	1.00E-02	3.8E-01	Ohio EPA	2.6E-02
AOI C	INORG	Zinc	T	6	1	9.50E-03	9.50E-03	3.9E-01	Ohio EPA	2.4E-02
SWMU 22	SVOC	Pyridine	T	3	1	6.10E-04	6.10E-04	2.4E+00	USEPA R5	2.6E-04
SWMU 22	INORG	Aluminum	T	3	2	2.25E-01	4.53E-01	8.7E-02	FED AWQC	**5.2E+00**
SWMU 22	INORG	Barium	D	3	1	8.00E-03	8.00E-03	2.2E-01	USEPA R5	3.6E-02
SWMU 22	INORG	Barium	T	3	3	1.05E-02	1.07E-02	2.2E-01	Ohio EPA	4.9E-02
SWMU 22	INORG	Chromium III	T	3	1	1.00E-03	1.00E-03	7.4E-02	FED AWQC	1.4E-02
SWMU 22	INORG	Chromium VI	T	3	1	9.00E-03	9.00E-03	1.1E-02	FED AWQC	8.2E-01
SWMU 22	INORG	Iron	T	3	3	1.77E-01	2.10E-01	1.0E+00	FED AWQC	2.1E-01
SWMU 22	INORG	Manganese	D	3	3	3.00E-02	3.31E-02		NA	
SWMU 22	INORG	Manganese	T	3	2	4.89E-02	4.94E-02		NA	
SWMU 22	INORG	Mercury	D	3	3	4.70E-04	6.00E-04	7.7E-04	Ohio EPA	7.8E-01
SWMU 22	INORG	Mercury	T	3	3	5.40E-04	1.60E-03	9.1E-04	Ohio EPA	**1.8E+00**
SWMU 22	INORG	Nickel	T	3	1	3.50E-03	3.50E-03	9.2E-02	Ohio EPA	3.8E-02
SWMU 22	INORG	Thallium	T	3	1	5.50E-03	5.50E-03	1.7E-02	Ohio EPA	3.2E-01

Table 2. Surface Water Ecological Screening
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Meas Basis	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Surface Water Screening Value[a] (mg/L)		Ratio of Max Detect to SW Screening Value
AOI B	VOC	Carbon Disulfide	T	6	1	3.10E-04	3.10E-04	1.5E-02	Ohio EPA	2.1E-02
AOI B	SVOC	Benzo(b)fluoranthene	T	6	1	2.90E-05	2.90E-05	9.1E-03	USEPA R5	3.2E-03
AOI B	SVOC	Benzo(e)pyrene	T	6	1	1.90E-05	1.90E-05		NA	
AOI B	SVOC	bis(2-Ethylhexyl)phthalate	T	6	1	1.70E-03	1.70E-03	8.4E-03	Ohio EPA	2.0E-01
AOI B	SVOC	Chrysene	T	6	1	2.90E-05	2.90E-05		NA	
AOI B	SVOC	Fluoranthene	T	6	3	2.20E-05	5.30E-05	8.0E-04	Ohio EPA	6.6E-02
AOI B	SVOC	Indeno(1,2,3-cd)pyrene	T	6	1	2.10E-05	2.10E-05	4.3E-03	USEPA R5	4.9E-03
AOI B	SVOC	Pyrene	T	6	2	2.10E-05	4.10E-05	4.6E-03	Ohio EPA	8.9E-03
AOI B	INORG	Antimony	D	6	1	2.50E-03	2.50E-03	8.0E-02	USEPA R5	3.1E-02
AOI B	INORG	Antimony	T	6	1	1.02E-02	1.02E-02	1.9E-01	Ohio EPA	5.4E-02
AOI B	INORG	Barium	D	6	6	5.76E-02	9.43E-02	2.2E-01	USEPA R5	4.3E-01
AOI B	INORG	Barium	T	6	6	6.00E-02	8.11E-02	2.2E-01	Ohio EPA	3.7E-01
AOI B	INORG	Chromium III	T	6	1	1.00E-03	1.00E-03	7.4E-02	FED AWQC	1.4E-02
AOI B	INORG	Chromium VI	T	6	1	4.00E-03	4.00E-03	1.1E-02	FED AWQC	3.6E-01
AOI B	INORG	Iron	T	6	4	8.85E-02	3.05E-01	1.0E+00	FED AWQC	3.1E-01
AOI B	INORG	Manganese	D	6	3	1.50E-03	2.50E-02		NA	
AOI B	INORG	Manganese	T	6	6	1.31E-02	1.03E-01		NA	
AOI B	INORG	Mercury	D	6	3	1.80E-04	3.50E-04	7.7E-04	Ohio EPA	4.5E-01
AOI B	INORG	Mercury	T	6	3	5.20E-04	2.20E-03	9.1E-04	Ohio EPA	**2.4E+00**
AOI B	INORG	Thallium	D	6	2	4.70E-03	5.30E-03	1.0E-02	USEPA R5	5.3E-01
AOI B	INORG	Thallium	T	6	1	5.30E-03	5.30E-03	1.7E-02	Ohio EPA	3.1E-01
AOI B	INORG	Vanadium	T	6	2	9.90E-04	1.40E-03	4.4E-02	Ohio EPA	3.2E-02
AOI B	INORG	Zinc	D	6	2	5.80E-03	6.20E-03	2.3E-01	Ohio EPA	2.6E-02
AOI B	INORG	Zinc	T	6	2	6.80E-03	7.32E-02	2.4E-01	Ohio EPA	3.1E-01

a. With the exception of beryllium, the hardness dependent criteria are calculated using the equations for OMZA criteria shown on Table 7-9 of the statewide water quality standards (Chapter 3745-1, http://www.epa.state.oh.us/portals/35/rules/01-07.pdf). The beryllium criterion was calculated using the OMZA equation in the footnote of the Tier I/Tier II summary table (http://www.epa.state.oh.us/portals/35/wqs/Ohioval13.pdf).

Only constituents detected in each area are shown.
Ratios of concentration to the criteria greater than 1 are shaded in bold.
Chem Group - chemical group
Meas Basis - measured basis; T = total, D = dissolved

Table 3a. Sediment Ecological Screening
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Sediment Screening Value (mg/kg)		Ratio of Max Detect to Sediment Screening Value
AOI C	VOC	Acetone	7	4	2.10E-02	1.50E-01	9.9E-03	USEPA R5	**1.5E+01**
AOI C	VOC	2-Butanone	7	6	3.60E-03	3.50E-02	4.2E-02	USEPA R5	8.3E-01
AOI C	VOC	Tetrachloroethene	7	1	4.80E-01	4.80E-01	9.9E-01	USEPA R5	4.8E-01
AOI C	VOC	Trichloroethene	7	1	8.80E-02	8.80E-02	1.1E-01	USEPA R5	7.9E-01
AOI C	SVOC	Acenaphthylene	7	1	1.20E-02	1.20E-02	5.9E-03	USEPA R5	**2.0E+00**
AOI C	SVOC	Anthracene	7	3	1.40E-02	4.40E-02	5.7E-02	USEPA R5	7.7E-01
AOI C	SVOC	C1-Anthracenes/Phenanthrenes	7	5	1.50E-02	1.50E-01		NA	
AOI C	SVOC	C2-Anthracenes/Phenanthrenes	7	5	1.80E-02	1.20E-01		NA	
AOI C	SVOC	C3-Anthracenes/Phenanthrenes	7	4	1.80E-02	8.60E-02		NA	
AOI C	SVOC	C4-Anthracenes/Phenanthrenes	7	1	4.40E-02	4.40E-02		NA	
AOI C	SVOC	Benzo(a)anthracene	7	7	1.00E-02	1.80E-01	1.1E-01	USEPA R5	**1.7E+00**
AOI C	SVOC	Benzo(a)pyrene	7	7	1.20E-02	2.50E-01	1.5E-01	USEPA R5	**1.7E+00**
AOI C	SVOC	Benzo(b)fluoranthene	7	7	1.90E-02	3.40E-01	1.0E+01	USEPA R5	3.3E-02
AOI C	SVOC	Benzo(e)pyrene	7	7	1.10E-02	1.80E-01		NA	
AOI C	SVOC	Benzo(g,h,i)perylene	7	7	1.10E-02	1.90E-01	1.7E-01	USEPA R5	**1.1E+00**
AOI C	SVOC	Benzo(k)fluoranthene	7	7	6.70E-03	1.30E-01	2.4E-01	USEPA R5	5.4E-01
AOI C	SVOC	Biphenyl	7	1	9.90E-03	9.90E-03		NA	
AOI C	SVOC	bis(2-Ethylhexyl)phthalate	7	4	5.00E-02	9.70E-02	1.8E-01	USEPA R5	5.3E-01
AOI C	SVOC	Chrysene	7	7	1.60E-02	2.50E-01	1.7E-01	USEPA R5	**1.5E+00**
AOI C	SVOC	C1-Chrysenes	7	7	6.50E-03	1.30E-01		NA	
AOI C	SVOC	C2-Chrysenes	7	5	8.10E-03	9.00E-02		NA	
AOI C	SVOC	C3-Chrysenes	7	2	2.30E-02	7.10E-02		NA	
AOI C	SVOC	Dibenz(a,h)anthracene	7	5	1.20E-02	3.50E-02	3.3E-02	USEPA R5	**1.1E+00**
AOI C	SVOC	Dibenzofuran	7	1	3.30E-02	3.30E-02	4.5E-01	USEPA R5	7.3E-02
AOI C	SVOC	C1-Dibenzothiophenes	7	1	9.90E-03	9.90E-03		NA	
AOI C	SVOC	Fluoranthene	7	7	2.70E-02	4.80E-01	4.2E-01	USEPA R5	**1.1E+00**
AOI C	SVOC	C1-Fluoranthenes/Pyrenes	7	7	9.10E-03	1.90E-01		NA	
AOI C	SVOC	Fluorene	7	1	1.80E-02	1.80E-02	7.7E-02	USEPA R5	2.3E-01
AOI C	SVOC	C1-Fluorenes	7	1	3.10E-02	3.10E-02		NA	
AOI C	SVOC	C2-Fluorenes	7	1	3.30E-02	3.30E-02		NA	
AOI C	SVOC	C3-Fluorenes	7	1	3.50E-02	3.50E-02		NA	
AOI C	SVOC	Indeno(1,2,3-cd)pyrene	7	7	1.20E-02	1.90E-01	2.0E-01	USEPA R5	9.5E-01
AOI C	SVOC	1-Methylnaphthalene	7	3	1.40E-02	4.70E-02		NA	
AOI C	SVOC	2-Methylnaphthalene	7	3	1.40E-02	4.10E-02	2.0E-02	USEPA R5	**2.0E+00**
AOI C	SVOC	Naphthalene	7	3	1.30E-02	2.90E-02	1.8E-01	USEPA R5	1.6E-01
AOI C	SVOC	C2-Naphthalene2	7	4	1.60E-02	1.00E-01		NA	
AOI C	SVOC	C3-Naphthalenes	7	3	1.30E-02	1.00E-01		NA	
AOI C	SVOC	C4-Naphthalenes	7	1	3.80E-02	3.80E-02		NA	
AOI C	SVOC	Perylene	7	5	1.40E-02	5.60E-02		NA	
AOI C	SVOC	Phenanthrene	7	7	1.20E-02	2.30E-01	2.0E-01	USEPA R5	**1.1E+00**
AOI C	SVOC	Pyrene	7	7	2.30E-02	3.80E-01	2.0E-01	USEPA R5	**1.9E+00**
AOI C	INORG	Aluminum	7	7	3.81E+03	1.38E+04	2.8E+04	Ohio EPA	4.9E-01
AOI C	INORG	Arsenic	7	7	2.40E+00	7.60E+00	1.1E+01	Ohio EPA	6.9E-01
AOI C	INORG	Barium	7	7	2.91E+01	1.18E+02	1.7E+02	Ohio EPA	6.9E-01
AOI C	INORG	Beryllium	7	7	1.10E-01	7.00E-01		NA	
AOI C	INORG	Cadmium	7	7	1.80E-01	1.20E+00	3.0E-01	Ohio EPA	**4.0E+00**
AOI C	INORG	Chromium (total)	7	7	7.80E+00	1.74E+01	3.0E+01	Ohio EPA	5.8E-01
AOI C	INORG	Chromium III	7	7	2.00E-01	1.04E+01		NA	
AOI C	INORG	Chromium VI	7	7	4.80E+00	2.05E+01		NA	
AOI C	INORG	Cobalt	7	7	3.20E+00	8.10E+00	5.0E+01	USEPA R5	1.6E-01
AOI C	INORG	Copper	7	7	1.43E+01	3.85E+01	2.5E+01	Ohio EPA	**1.5E+00**
AOI C	INORG	Iron	7	7	6.58E+03	2.51E+04	3.1E+04	Ohio EPA	8.1E-01
AOI C	INORG	Lead	7	7	1.02E+01	5.70E+01	3.6E+01	USEPA R5	**1.6E+00**
AOI C	INORG	Manganese	7	7	7.29E+01	2.43E+02	1.4E+03	Ohio EPA	1.7E-01
AOI C	INORG	Mercury	7	3	4.50E-02	1.40E-01	1.7E-01	USEPA R5	8.0E-01
AOI C	INORG	Nickel	7	7	6.20E+00	3.20E+01	3.3E+01	Ohio EPA	9.7E-01
AOI C	INORG	Selenium	7	4	1.90E+00	5.40E+00	1.6E+00	Ohio EPA	**3.4E+00**
AOI C	INORG	Vanadium	7	7	1.14E+01	2.78E+01		NA	
AOI C	INORG	Zinc	7	7	2.57E+01	1.10E+02	1.0E+02	Ohio EPA	**1.1E+00**
SWMU 22	VOC	Acetone	3	3	2.40E-01	4.00E+00	9.9E-03	USEPA R5	**4.0E+02**
SWMU 22	VOC	Acetonitrile	3	1	1.60E-01	1.60E-01	5.6E-02	USEPA R5	**2.9E+00**
SWMU 22	VOC	Benzene	3	1	3.70E-03	3.70E-03	1.4E-01	USEPA R5	2.6E-02

Table 3a. Sediment Ecological Screening
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Sediment Screening Value (mg/kg)		Ratio of Max Detect to Sediment Screening Value
SWMU 22	VOC	2-Butanone	3	3	5.30E-02	1.10E+00	4.2E-02	USEPA R5	**2.6E+01**
SWMU 22	VOC	Carbon Disulfide	3	3	2.50E-02	8.40E-02	2.4E-02	USEPA R5	**3.5E+00**
SWMU 22	VOC	Ethyl Benzene	3	3	2.00E-03	1.60E-01	1.8E-01	USEPA R5	9.1E-01
SWMU 22	VOC	Methylene Chloride	3	1	1.50E-02	1.50E-02	1.6E-01	USEPA R5	9.4E-02
SWMU 22	VOC	Toluene	3	3	1.20E-02	9.70E-01	1.2E+00	USEPA R5	8.0E-01
SWMU 22	VOC	Xylenes (total)	3	3	6.80E-03	7.10E-01	4.3E-01	USEPA R5	**1.6E+00**
SWMU 22	SVOC	Acenaphthene	3	2	7.70E-03	4.40E-02	6.7E-03	USEPA R5	**6.6E+00**
SWMU 22	SVOC	Anthracene	3	3	6.70E-03	1.70E-01	5.7E-02	USEPA R5	**3.0E+00**
SWMU 22	SVOC	C1-Anthracenes/Phenanthrenes	3	3	1.30E-01	3.20E+00		NA	
SWMU 22	SVOC	C2-Anthracenes/Phenanthrenes	3	3	8.70E-02	5.40E+00		NA	
SWMU 22	SVOC	C3-Anthracenes/Phenanthrenes	3	3	9.70E-02	6.70E+00		NA	
SWMU 22	SVOC	C4-Anthracenes/Phenanthrenes	3	3	8.80E-02	6.00E+00		NA	
SWMU 22	SVOC	Benzo(a)anthracene	3	3	1.40E-02	1.90E-01	1.1E-01	USEPA R5	**1.8E+00**
SWMU 22	SVOC	Benzo(a)pyrene	3	2	1.50E-02	1.20E-01	1.5E-01	USEPA R5	8.0E-01
SWMU 22	SVOC	Benzo(b)fluoranthene	3	3	2.20E-02	1.60E-01	1.0E+01	USEPA R5	1.5E-02
SWMU 22	SVOC	Benzo(e)pyrene	3	3	1.40E-02	1.50E-01		NA	
SWMU 22	SVOC	Benzo(g,h,i)perylene	3	3	1.60E-02	2.10E-01	1.7E-01	USEPA R5	**1.2E+00**
SWMU 22	SVOC	Benzo(k)fluoranthene	3	2	8.20E-03	6.40E-02	2.4E-01	USEPA R5	2.7E-01
SWMU 22	SVOC	Biphenyl	3	3	1.40E-02	2.40E-01		NA	
SWMU 22	SVOC	bis(2-Ethylhexyl)phthalate	3	3	7.90E-01	4.20E+00	1.8E-01	USEPA R5	**2.3E+01**
SWMU 22	SVOC	Chrysene	3	3	2.40E-02	1.80E-01	1.7E-01	USEPA R5	**1.1E+00**
SWMU 22	SVOC	C1-Chrysenes	3	3	1.80E-02	5.70E-01		NA	
SWMU 22	SVOC	C2-Chrysenes	3	2	6.30E-01	9.80E-01		NA	
SWMU 22	SVOC	C3-Chrysenes	3	1	1.00E+00	1.00E+00		NA	
SWMU 22	SVOC	Dibenzofuran	3	3	1.20E-02	7.20E-02	4.5E-01	USEPA R5	1.6E-01
SWMU 22	SVOC	C1-Dibenzothiophenes	3	3	2.90E-02	1.80E+00		NA	
SWMU 22	SVOC	C3-Dibenzothiophenes	3	3	9.40E-02	5.60E+00		NA	
SWMU 22	SVOC	C2-Dibenzothiophenes	3	3	8.90E-02	4.40E+00		NA	
SWMU 22	SVOC	Fluoranthene	3	3	4.20E-02	7.10E-01	4.2E-01	USEPA R5	**1.7E+00**
SWMU 22	SVOC	C1-Fluoranthenes/Pyrenes	3	3	5.00E-02	1.90E+00		NA	
SWMU 22	SVOC	Fluorene	3	3	3.90E-02	2.30E-01	7.7E-02	USEPA R5	**3.0E+00**
SWMU 22	SVOC	C1-Fluorenes	3	3	1.20E-01	1.90E+00		NA	
SWMU 22	SVOC	C2-Fluorenes	3	3	2.40E-01	5.00E+00		NA	
SWMU 22	SVOC	C3-Fluorenes	3	3	2.20E-01	8.10E+00		NA	
SWMU 22	SVOC	Indeno(1,2,3-cd)pyrene	3	3	1.50E-02	1.70E-01	2.0E-01	USEPA R5	8.5E-01
SWMU 22	SVOC	1-Methylnaphthalene	3	2	1.60E-02	9.20E-02		NA	
SWMU 22	SVOC	2-Methylnaphthalene	3	3	9.10E-03	1.30E-01	2.0E-02	USEPA R5	**6.4E+00**
SWMU 22	SVOC	Naphthalene	3	3	1.70E-02	1.30E-01	1.8E-01	USEPA R5	7.4E-01
SWMU 22	SVOC	C2-Naphthalene2	3	3	6.10E-02	9.10E-01		NA	
SWMU 22	SVOC	C3-Naphthalenes	3	3	9.40E-02	2.70E+00		NA	
SWMU 22	SVOC	C4-Naphthalenes	3	3	6.60E-02	3.20E+00		NA	
SWMU 22	SVOC	Perylene	3	1	4.70E-03	4.70E-03		NA	
SWMU 22	SVOC	Phenanthrene	3	3	1.30E-01	9.90E-01	2.0E-01	USEPA R5	**4.9E+00**
SWMU 22	SVOC	Pyrene	3	3	4.10E-02	7.10E-01	2.0E-01	USEPA R5	**3.6E+00**
SWMU 22	INORG	Aluminum	3	3	3.37E+04	9.02E+04	2.8E+04	Ohio EPA	**3.2E+00**
SWMU 22	INORG	Antimony	3	1	1.80E+00	1.80E+00		NA	
SWMU 22	INORG	Arsenic	3	3	4.90E+00	1.32E+01	1.1E+01	Ohio EPA	**1.2E+00**
SWMU 22	INORG	Barium	3	3	5.20E+01	1.06E+02	1.7E+02	Ohio EPA	6.2E-01
SWMU 22	INORG	Chromium (total)	3	3	5.21E+01	1.99E+02	3.0E+01	Ohio EPA	**6.6E+00**
SWMU 22	INORG	Chromium III	3	3	5.17E+01	1.98E+02		NA	
SWMU 22	INORG	Cobalt	3	2	2.20E+00	8.70E+00	5.0E+01	USEPA R5	1.7E-01
SWMU 22	INORG	Copper	3	3	6.13E+01	9.20E+02	2.5E+01	Ohio EPA	**3.7E+01**
SWMU 22	INORG	Iron	3	3	3.58E+03	2.35E+04	3.1E+04	Ohio EPA	7.6E-01
SWMU 22	INORG	Lead	3	2	7.00E+00	5.50E+01	3.6E+01	USEPA R5	**1.5E+00**
SWMU 22	INORG	Manganese	3	3	2.91E+01	2.10E+02	1.4E+03	Ohio EPA	1.5E-01
SWMU 22	INORG	Mercury	3	1	1.00E-01	1.00E-01	1.7E-01	USEPA R5	5.7E-01
SWMU 22	INORG	Nickel	3	3	1.26E+01	7.42E+01	3.3E+01	Ohio EPA	**2.2E+00**
SWMU 22	INORG	Silver	3	2	8.70E+00	1.32E+01	5.0E-01	USEPA R5	**2.6E+01**
SWMU 22	INORG	Vanadium	3	3	1.46E+01	3.44E+01		NA	
SWMU 22	INORG	Zinc	3	3	1.48E+02	1.94E+03	1.0E+02	Ohio EPA	**1.9E+01**
AOI B	VOC	Acetone	6	1	1.10E-02	1.10E-02	9.9E-03	USEPA R5	**1.1E+00**
AOI B	VOC	2-Butanone	6	3	2.90E-03	7.50E-03	4.2E-02	USEPA R5	1.8E-01

Table 3a. Sediment Ecological Screening
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Sediment Screening Value (mg/kg)		Ratio of Max Detect to Sediment Screening Value
AOI B	VOC	Methylene Chloride	6	1	1.10E-03	1.10E-03	1.6E-01	USEPA R5	6.9E-03
AOI B	VOC	Tetrachloroethene	6	1	1.00E-03	1.00E-03	9.9E-01	USEPA R5	1.0E-03
AOI B	SVOC	Acenaphthene	6	4	1.30E-02	6.60E-02	6.7E-03	USEPA R5	**9.8E+00**
AOI B	SVOC	Acenaphthylene	6	4	8.70E-03	5.40E-02	5.9E-03	USEPA R5	**9.2E+00**
AOI B	SVOC	Anthracene	6	4	4.30E-02	3.70E-01	5.7E-02	USEPA R5	**6.5E+00**
AOI B	SVOC	C1-Anthracenes/Phenanthrenes	6	4	1.30E-01	1.10E+00		NA	
AOI B	SVOC	C2-Anthracenes/Phenanthrenes	6	4	7.50E-02	5.60E-01		NA	
AOI B	SVOC	C3-Anthracenes/Phenanthrenes	6	4	3.20E-02	2.50E-01		NA	
AOI B	SVOC	C4-Anthracenes/Phenanthrenes	6	4	1.30E-02	7.50E-02		NA	
AOI B	SVOC	Benzo(a)anthracene	6	5	1.00E-02	4.70E+00	1.1E-01	USEPA R5	**4.4E+01**
AOI B	SVOC	Benzo(a)pyrene	6	5	1.40E-02	6.80E+00	1.5E-01	USEPA R5	**4.5E+01**
AOI B	SVOC	Benzo(b)fluoranthene	6	6	4.40E-03	1.10E+01	1.0E+01	USEPA R5	**1.1E+00**
AOI B	SVOC	Benzo(e)pyrene	6	5	1.60E-02	5.60E+00		NA	
AOI B	SVOC	Benzo(g,h,i)perylene	6	5	1.70E-02	6.30E+00	1.7E-01	USEPA R5	**3.7E+01**
AOI B	SVOC	Benzo(k)fluoranthene	6	5	9.40E-03	4.00E+00	2.4E-01	USEPA R5	**1.7E+01**
AOI B	SVOC	Biphenyl	6	1	6.90E-03	6.90E-03		NA	
AOI B	SVOC	Chrysene	6	6	3.50E-03	7.90E+00	1.7E-01	USEPA R5	**4.8E+01**
AOI B	SVOC	C1-Chrysenes	6	5	5.70E-03	1.40E+00		NA	
AOI B	SVOC	C2-Chrysenes	6	4	6.80E-02	4.00E-01		NA	
AOI B	SVOC	C3-Chrysenes	6	4	4.00E-02	2.30E-01		NA	
AOI B	SVOC	C4-Chrysenes	6	2	3.40E-02	8.40E-02		NA	
AOI B	SVOC	Dibenz(a,h)anthracene	6	4	1.30E-01	1.30E+00	3.3E-02	USEPA R5	**3.9E+01**
AOI B	SVOC	Dibenzofuran	6	4	1.30E-02	8.40E-02	4.5E-01	USEPA R5	1.9E-01
AOI B	SVOC	C1-Dibenzothiophenes	6	1	7.20E-03	7.20E-03		NA	
AOI B	SVOC	C3-Dibenzothiophenes	6	3	9.60E-03	6.90E-02		NA	
AOI B	SVOC	C2-Dibenzothiophenes	6	4	8.40E-03	5.60E-02		NA	
AOI B	SVOC	Fluoranthene	6	6	5.50E-03	1.60E+01	4.2E-01	USEPA R5	**3.8E+01**
AOI B	SVOC	C1-Fluoranthenes/Pyrenes	6	5	7.10E-03	2.00E+00		NA	
AOI B	SVOC	Fluorene	6	4	1.90E-02	1.40E-01	7.7E-02	USEPA R5	**1.8E+00**
AOI B	SVOC	C1-Fluorenes	6	3	8.10E-03	3.80E-02		NA	
AOI B	SVOC	C2-Fluorenes	6	4	7.20E-03	4.00E-02		NA	
AOI B	SVOC	C3-Fluorenes	6	4	1.20E-02	8.50E-02		NA	
AOI B	SVOC	Indeno(1,2,3-cd)pyrene	6	6	2.90E-03	7.70E+00	2.0E-01	USEPA R5	**3.9E+01**
AOI B	SVOC	1-Methylnaphthalene	6	2	5.80E-03	8.50E-03		NA	
AOI B	SVOC	2-Methylnaphthalene	6	2	6.00E-03	8.30E-03	2.0E-02	USEPA R5	4.1E-01
AOI B	SVOC	Naphthalene	6	3	6.10E-03	1.30E-02	1.8E-01	USEPA R5	7.4E-02
AOI B	SVOC	C2-Naphthalene2	6	4	6.80E-03	2.00E-02		NA	
AOI B	SVOC	C3-Naphthalenes	6	3	8.50E-03	2.20E-02		NA	
AOI B	SVOC	C4-Naphthalenes	6	3	9.70E-03	2.10E-02		NA	
AOI B	SVOC	Perylene	6	4	1.80E-01	1.40E+00		NA	
AOI B	SVOC	Phenanthrene	6	5	9.20E-03	4.80E+00	2.0E-01	USEPA R5	**2.4E+01**
AOI B	SVOC	Pyrene	6	6	4.50E-03	1.20E+01	2.0E-01	USEPA R5	**6.2E+01**
AOI B	INORG	Aluminum	6	6	1.21E+03	5.45E+03	2.8E+04	Ohio EPA	1.9E-01
AOI B	INORG	Arsenic	6	6	2.20E+00	7.90E+00	1.1E+01	Ohio EPA	7.2E-01
AOI B	INORG	Barium	6	6	7.80E+00	6.96E+01	1.7E+02	Ohio EPA	4.1E-01
AOI B	INORG	Beryllium	6	3	7.00E-02	1.90E-01		NA	
AOI B	INORG	Cadmium	6	5	5.00E-02	2.20E-01	3.0E-01	Ohio EPA	7.3E-01
AOI B	INORG	Chromium (total)	6	6	4.00E+00	2.47E+01	3.0E+01	Ohio EPA	8.2E-01
AOI B	INORG	Chromium III	6	6	3.88E+00	2.44E+01		NA	
AOI B	INORG	Cobalt	6	6	1.40E+00	5.40E+00	5.0E+01	USEPA R5	1.1E-01
AOI B	INORG	Copper	6	5	1.80E+00	1.67E+01	2.5E+01	Ohio EPA	6.7E-01
AOI B	INORG	Iron	6	6	5.11E+03	1.21E+04	3.1E+04	Ohio EPA	3.9E-01
AOI B	INORG	Lead	6	6	2.30E+00	1.24E+01	3.6E+01	USEPA R5	3.5E-01
AOI B	INORG	Manganese	6	6	1.38E+02	6.82E+02	1.4E+03	Ohio EPA	4.9E-01

Table 3a. Sediment Ecological Screening
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Sediment Screening Value (mg/kg)		Ratio of Max Detect to Sediment Screening Value
AOI B	INORG	Nickel	6	6	1.10E+00	1.12E+01	3.3E+01	Ohio EPA	3.4E-01
AOI B	INORG	Selenium	6	1	6.70E-01	6.70E-01	1.6E+00	Ohio EPA	4.2E-01
AOI B	INORG	Vanadium	6	6	4.30E+00	1.35E+01		NA	
AOI B	INORG	Zinc	6	6	1.72E+01	4.53E+02	1.0E+02	Ohio EPA	**4.5E+00**

Only constituents detected in each area are shown.
The concentrations for the Xylene isomers (m/p and o) were summed before comparing to the criteria for Xylenes (total).
Ratios of concentration to the criteria greater than 1 are shaded in bold.
Chem Group - chemical group
mg/kg: milligrams per kilogram
SVOC: Semivolatile organic compound
VOC: Volatile organic compound

Table 3b. Refined Sediment Screening Evaluation
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Ohio Sediment Reference Values (mg/kg)	Ratio of Max Detect to Ohio Sediment Reference Values	Region 5 Sed ESL (mg/kg)	Ratio of Max Detect to Region 5 Sed ESL	Consensus Based PECs (mg/kg)	Ratio of Max Detect to Consensus Based PECs
AOI C	VOC	Acetone	7	4	2.10E-02	1.50E-01			9.9E-03	**1.5E+01**		
AOI C	SVOC	Acenaphthylene	7	1	1.20E-02	1.20E-02			5.9E-03	**2.0E+00**		
AOI C	SVOC	C1-Anthracenes/Phenanthrenes	7	5	1.50E-02	1.50E-01						
AOI C	SVOC	C2-Anthracenes/Phenanthrenes	7	5	1.80E-02	1.20E-01						
AOI C	SVOC	C3-Anthracenes/Phenanthrenes	7	4	1.80E-02	8.60E-02						
AOI C	SVOC	C4-Anthracenes/Phenanthrenes	7	1	4.40E-02	4.40E-02						
AOI C	SVOC	Benzo(a)anthracene	7	7	1.00E-02	1.80E-01			1.1E-01	**1.7E+00**	1.1E+00	1.7E-01
AOI C	SVOC	Benzo(a)pyrene	7	7	1.20E-02	2.50E-01			1.5E-01	**1.7E+00**	1.5E+00	1.7E-01
AOI C	SVOC	Benzo(e)pyrene	7	7	1.10E-02	1.80E-01						
AOI C	SVOC	Benzo(g,h,i)perylene	7	7	1.10E-02	1.90E-01			1.7E-01	**1.1E+00**		
AOI C	SVOC	Biphenyl	7	1	9.90E-03	9.90E-03						
AOI C	SVOC	Chrysene	7	7	1.60E-02	2.50E-01			1.7E-01	**1.5E+00**	1.3E+00	1.9E-01
AOI C	SVOC	C1-Chrysenes	7	7	6.50E-03	1.30E-01						
AOI C	SVOC	C2-Chrysenes	7	5	8.10E-03	9.00E-02						
AOI C	SVOC	C3-Chrysenes	7	2	2.30E-02	7.10E-02						
AOI C	SVOC	Dibenz(a,h)anthracene	7	5	1.20E-02	3.50E-02			3.3E-02	**1.1E+00**		
AOI C	SVOC	C1-Dibenzothiophenes	7	1	9.90E-03	9.90E-03						
AOI C	SVOC	Fluoranthene	7	7	2.70E-02	4.80E-01			4.2E-01	**1.1E+00**	2.2E+00	2.2E-01
AOI C	SVOC	C1-Fluoranthenes/Pyrenes	7	7	9.10E-03	1.90E-01						
AOI C	SVOC	C1-Fluorenes	7	1	3.10E-02	3.10E-02						
AOI C	SVOC	C2-Fluorenes	7	1	3.30E-02	3.30E-02						
AOI C	SVOC	C3-Fluorenes	7	1	3.50E-02	3.50E-02						
AOI C	SVOC	1-Methylnaphthalene	7	3	1.40E-02	4.70E-02						
AOI C	SVOC	2-Methylnaphthalene	7	3	1.40E-02	4.10E-02			2.0E-02	**2.0E+00**		
AOI C	SVOC	C2-Naphthalene2	7	4	1.60E-02	1.00E-01						
AOI C	SVOC	C3-Naphthalenes	7	3	1.30E-02	1.00E-01						
AOI C	SVOC	C4-Naphthalenes	7	1	3.80E-02	3.80E-02						
AOI C	SVOC	Perylene	7	5	1.40E-02	5.60E-02						
AOI C	SVOC	Phenanthrene	7	7	1.20E-02	2.30E-01			2.0E-01	**1.1E+00**	1.2E+00	2.0E-01
AOI C	SVOC	Pyrene	7	7	2.30E-02	3.80E-01			2.0E-01	**1.9E+00**	1.5E+00	2.5E-01
AOI C	INORG	Beryllium	7	7	1.10E-01	7.00E-01						
AOI C	INORG	Cadmium	7	7	1.80E-01	1.20E+00	3.0E-01	**4.0E+00**	9.9E-01	**1.2E+00**	5.0E+00	2.4E-01
AOI C	INORG	Chromium III	7	7	2.00E-01	1.04E+01						
AOI C	INORG	Chromium VI	7	7	4.80E+00	2.05E+01						
AOI C	INORG	Copper	7	7	1.43E+01	3.85E+01	2.5E+01	**1.5E+00**	3.2E+01	**1.2E+00**	1.5E+02	2.6E-01
AOI C	INORG	Lead	7	7	1.02E+01	5.70E+01			3.6E+01	**1.6E+00**	1.3E+02	4.5E-01
AOI C	INORG	Selenium	7	4	1.90E+00	5.40E+00	1.6E+00	**3.4E+00**				
AOI C	INORG	Vanadium	7	7	1.14E+01	2.78E+01						
AOI C	INORG	Zinc	7	7	2.57E+01	1.10E+02	1.0E+02	**1.1E+00**	1.2E+02	9.1E-01	4.6E+02	2.4E-01
SWMU 22	VOC	Acetone	3	3	2.40E-01	4.00E+00			9.9E-03	**4.0E+02**		
SWMU 22	VOC	Acetonitrile	3	1	1.60E-01	1.60E-01			5.6E-02	**2.9E+00**		
SWMU 22	VOC	2-Butanone	3	3	5.30E-02	1.10E+00			4.2E-02	**2.6E+01**		

Table 3b. Refined Sediment Screening Evaluation
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Ohio Sediment Reference Values (mg/kg)	Ratio of Max Detect to Ohio Sediment Reference Values	Region 5 Sed ESL (mg/kg)	Ratio of Max Detect to Region 5 Sed ESL	Consensus Based PECs (mg/kg)	Ratio of Max Detect to Consensus Based PECs
SWMU 22	VOC	Carbon Disulfide	3	3	2.50E-02	8.40E-02			2.4E-02	**3.5E+00**		
SWMU 22	VOC	Xylenes (total)	3	3	6.80E-03	7.10E-01			4.3E-01	**1.6E+00**		
SWMU 22	SVOC	Acenaphthene	3	2	7.70E-03	4.40E-02			6.7E-03	**6.6E+00**		
SWMU 22	SVOC	Anthracene	3	3	6.70E-03	1.70E-01			5.7E-02	**3.0E+00**	8.5E-01	2.0E-01
SWMU 22	SVOC	C1-Anthracenes/Phenanthrenes	3	3	1.30E-01	3.20E+00						
SWMU 22	SVOC	C2-Anthracenes/Phenanthrenes	3	3	8.70E-02	5.40E+00						
SWMU 22	SVOC	C3-Anthracenes/Phenanthrenes	3	3	9.70E-02	6.70E+00						
SWMU 22	SVOC	C4-Anthracenes/Phenanthrenes	3	3	8.80E-02	6.00E+00						
SWMU 22	SVOC	Benzo(a)anthracene	3	3	1.40E-02	1.90E-01			1.1E-01	**1.8E+00**	1.1E+00	1.8E-01
SWMU 22	SVOC	Benzo(e)pyrene	3	3	1.40E-02	1.50E-01						
SWMU 22	SVOC	Benzo(g,h,i)perylene	3	3	1.60E-02	2.10E-01			1.7E-01	**1.2E+00**		
SWMU 22	SVOC	Biphenyl	3	3	1.40E-02	2.40E-01						
SWMU 22	SVOC	bis(2-Ethylhexyl)phthalate	3	3	7.90E-01	4.20E+00			1.8E-01	**2.3E+01**		
SWMU 22	SVOC	Chrysene	3	3	2.40E-02	1.80E-01			1.7E-01	**1.1E+00**	1.3E+00	1.4E-01
SWMU 22	SVOC	C1-Chrysenes	3	3	1.80E-02	5.70E-01						
SWMU 22	SVOC	C2-Chrysenes	3	2	6.30E-01	9.80E-01						
SWMU 22	SVOC	C3-Chrysenes	3	1	1.00E+00	1.00E+00						
SWMU 22	SVOC	C1-Dibenzothiophenes	3	3	2.90E-02	1.80E+00						
SWMU 22	SVOC	C3-Dibenzothiophenes	3	3	9.40E-02	5.60E+00						
SWMU 22	SVOC	C2-Dibenzothiophenes	3	3	8.90E-02	4.40E+00						
SWMU 22	SVOC	Fluoranthene	3	3	4.20E-02	7.10E-01			4.2E-01	**1.7E+00**	2.2E+00	3.2E-01
SWMU 22	SVOC	C1-Fluoranthenes/Pyrenes	3	3	5.00E-02	1.90E+00						
SWMU 22	SVOC	Fluorene	3	3	3.90E-02	2.30E-01			7.7E-02	**3.0E+00**	5.4E-01	4.3E-01
SWMU 22	SVOC	C1-Fluorenes	3	3	1.20E-01	1.90E+00						
SWMU 22	SVOC	C2-Fluorenes	3	3	2.40E-01	5.00E+00						
SWMU 22	SVOC	C3-Fluorenes	3	3	2.20E-01	8.10E+00						
SWMU 22	SVOC	1-Methylnaphthalene	3	2	1.60E-02	9.20E-02						
SWMU 22	SVOC	2-Methylnaphthalene	3	3	9.10E-03	1.30E-01			2.0E-02	**6.4E+00**		
SWMU 22	SVOC	C2-Naphthalene2	3	3	6.10E-02	9.10E-01						
SWMU 22	SVOC	C3-Naphthalenes	3	3	9.40E-02	2.70E+00						
SWMU 22	SVOC	C4-Naphthalenes	3	3	6.60E-02	3.20E+00						
SWMU 22	SVOC	Perylene	3	1	4.70E-03	4.70E-03						
SWMU 22	SVOC	Phenanthrene	3	3	1.30E-01	9.90E-01			2.0E-01	**4.9E+00**	1.2E+00	8.5E-01
SWMU 22	SVOC	Pyrene	3	3	4.10E-02	7.10E-01			2.0E-01	**3.6E+00**	1.5E+00	4.7E-01
SWMU 22	INORG	Aluminum	3	3	3.37E+04	9.02E+04	2.8E+04	**3.2E+00**				
SWMU 22	INORG	Antimony	3	1	1.80E+00	1.80E+00						
SWMU 22	INORG	Arsenic	3	3	4.90E+00	1.32E+01	1.1E+01	**1.2E+00**	9.8E+00	**1.3E+00**	3.3E+01	4.0E-01
SWMU 22	INORG	Chromium (total)	3	3	5.21E+01	1.99E+02	3.0E+01	**6.6E+00**	4.3E+01	**4.6E+00**	1.1E+02	**1.8E+00**
SWMU 22	INORG	Chromium III	3	3	5.17E+01	1.98E+02						
SWMU 22	INORG	Copper	3	3	6.13E+01	9.20E+02	2.5E+01	**3.7E+01**	3.2E+01	**2.9E+01**	1.5E+02	**6.2E+00**
SWMU 22	INORG	Lead	3	2	7.00E+00	5.50E+01			3.6E+01	**1.5E+00**	1.3E+02	4.3E-01
SWMU 22	INORG	Nickel	3	3	1.26E+01	7.42E+01	3.3E+01	**2.2E+00**	2.3E+01	**3.3E+00**	4.9E+01	**1.5E+00**

Table 3b. Refined Sediment Screening Evaluation
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Ohio Sediment Reference Values (mg/kg)	Ratio of Max Detect to Ohio Sediment Reference Values	Region 5 Sed ESL (mg/kg)	Ratio of Max Detect to Region 5 Sed ESL	Consensus Based PECs (mg/kg)	Ratio of Max Detect to Consensus Based PECs
SWMU 22	INORG	Silver	3	2	8.70E+00	1.32E+01			5.0E-01	**2.6E+01**		
SWMU 22	INORG	Vanadium	3	3	1.46E+01	3.44E+01						
SWMU 22	INORG	Zinc	3	3	1.48E+02	1.94E+03	1.0E+02	**1.9E+01**	1.2E+02	**1.6E+01**	4.6E+02	**4.2E+00**
AOI B	VOC	Acetone	6	1	1.10E-02	1.10E-02			9.9E-03	**1.1E+00**		
AOI B	SVOC	Acenaphthene	6	4	1.30E-02	6.60E-02			6.7E-03	**9.8E+00**		
AOI B	SVOC	Acenaphthylene	6	4	8.70E-03	5.40E-02			5.9E-03	**9.2E+00**		
AOI B	SVOC	Anthracene	6	4	4.30E-02	3.70E-01			5.7E-02	**6.5E+00**	8.5E-01	4.4E-01
AOI B	SVOC	C1-Anthracenes/Phenanthrenes	6	4	1.30E-01	1.10E+00						
AOI B	SVOC	C2-Anthracenes/Phenanthrenes	6	4	7.50E-02	5.60E-01						
AOI B	SVOC	C3-Anthracenes/Phenanthrenes	6	4	3.20E-02	2.50E-01						
AOI B	SVOC	C4-Anthracenes/Phenanthrenes	6	4	1.30E-02	7.50E-02						
AOI B	SVOC	Benzo(a)anthracene	6	5	1.00E-02	4.70E+00			1.1E-01	**4.4E+01**	1.1E+00	**4.5E+00**
AOI B	SVOC	Benzo(a)pyrene	6	5	1.40E-02	6.80E+00			1.5E-01	**4.5E+01**	1.5E+00	**4.7E+00**
AOI B	SVOC	Benzo(b)fluoranthene	6	6	4.40E-03	1.10E+01			1.0E+01	**1.1E+00**		
AOI B	SVOC	Benzo(e)pyrene	6	5	1.60E-02	5.60E+00						
AOI B	SVOC	Benzo(g,h,i)perylene	6	5	1.70E-02	6.30E+00			1.7E-01	**3.7E+01**		
AOI B	SVOC	Benzo(k)fluoranthene	6	5	9.40E-03	4.00E+00			2.4E-01	**1.7E+01**		
AOI B	SVOC	Biphenyl	6	1	6.90E-03	6.90E-03						
AOI B	SVOC	Chrysene	6	6	3.50E-03	7.90E+00			1.7E-01	**4.8E+01**	1.3E+00	**6.1E+00**
AOI B	SVOC	C1-Chrysenes	6	5	5.70E-03	1.40E+00						
AOI B	SVOC	C2-Chrysenes	6	4	6.80E-02	4.00E-01						
AOI B	SVOC	C3-Chrysenes	6	4	4.00E-02	2.30E-01						
AOI B	SVOC	C4-Chrysenes	6	2	3.40E-02	8.40E-02						
AOI B	SVOC	Dibenz(a,h)anthracene	6	4	1.30E-01	1.30E+00			3.3E-02	**3.9E+01**		
AOI B	SVOC	C1-Dibenzothiophenes	6	1	7.20E-03	7.20E-03						
AOI B	SVOC	C3-Dibenzothiophenes	6	3	9.60E-03	6.90E-02						
AOI B	SVOC	C2-Dibenzothiophenes	6	4	8.40E-03	5.60E-02						
AOI B	SVOC	Fluoranthene	6	6	5.50E-03	1.60E+01			4.2E-01	**3.8E+01**	2.2E+00	**7.2E+00**
AOI B	SVOC	C1-Fluoranthenes/Pyrenes	6	5	7.10E-03	2.00E+00						
AOI B	SVOC	Fluorene	6	4	1.90E-02	1.40E-01			7.7E-02	**1.8E+00**	5.4E-01	2.6E-01
AOI B	SVOC	C1-Fluorenes	6	3	8.10E-03	3.80E-02						
AOI B	SVOC	C2-Fluorenes	6	4	7.20E-03	4.00E-02						
AOI B	SVOC	C3-Fluorenes	6	4	1.20E-02	8.50E-02						
AOI B	SVOC	Indeno(1,2,3-cd)pyrene	6	6	2.90E-03	7.70E+00			2.0E-01	**3.9E+01**		
AOI B	SVOC	1-Methylnaphthalene	6	2	5.80E-03	8.50E-03						
AOI B	SVOC	C2-Naphthalene2	6	4	6.80E-03	2.00E-02						
AOI B	SVOC	C3-Naphthalenes	6	3	8.50E-03	2.20E-02						
AOI B	SVOC	C4-Naphthalenes	6	3	9.70E-03	2.10E-02						
AOI B	SVOC	Perylene	6	4	1.80E-01	1.40E+00						
AOI B	SVOC	Phenanthrene	6	5	9.20E-03	4.80E+00			2.0E-01	**2.4E+01**	1.2E+00	**4.1E+00**
AOI B	SVOC	Pyrene	6	6	4.50E-03	1.20E+01			2.0E-01	**6.2E+01**	1.5E+00	**7.9E+00**
AOI B	INORG	Beryllium	6	3	7.00E-02	1.90E-01						

Table 3b. Refined Sediment Screening Evaluation
Bway Corporation, Cincinnati, OH

Area	**Chem Group**	**Chemical**	**Analyzed**	**Detected**	**Min Detected** (mg/kg)	**Max Detected** (mg/kg)	**Ohio Sediment Reference Values** (mg/kg)	**Ratio of Max Detect to Ohio Sediment Reference Values**	**Region 5 Sed ESL** (mg/kg)	**Ratio of Max Detect to Region 5 Sed ESL**	**Consensus Based PECs** (mg/kg)	**Ratio of Max Detect to Consensus Based PECs**
AOI B	INORG	Chromium III	6	6	3.88E+00	2.44E+01						
AOI B	INORG	Vanadium	6	6	4.30E+00	1.35E+01						
AOI B	INORG	Zinc	6	6	1.72E+01	4.53E+02	1.0E+02	**4.5E+00**	1.2E+02	**3.7E+00**	4.6E+02	9.9E-01

Only constituents detected in each area are shown.
The concentrations for the Xylene isomers (m/p and o) were summed before comparing to the criteria for Xylenes (total).
Ratios of concentration to the criteria greater than 1 are shaded in bold.
Chem Group - chemical group

Table 4. Sediment Porewater Ecological Screening
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Meas Basis	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Surface Water Screening Value[a] (mg/L)		Ratio of Conc to SW Screening Value
AOI B	VOC	Chloroform	T	7	2	3.90E-04	3.90E-04	1.4E-01	Ohio EPA	2.8E-03
AOI B	VOC	Toluene	T	7	1	2.70E-04	2.70E-04	6.2E-02	Ohio EPA	4.4E-03
AOI B	SVOC	Benzo(b)fluoranthene	T	7	1	4.80E-04	4.80E-04	9.1E-03	USEPA R5	5.3E-02
AOI B	SVOC	Fluoranthene	T	7	2	2.40E-04	4.00E-04	8.0E-04	Ohio EPA	5.0E-01
AOI B	SVOC	Pyrene	T	7	1	2.10E-04	2.10E-04	4.6E-03	Ohio EPA	4.6E-02
AOI B	INORG	Aluminum	D	7	1	1.46E-01	1.46E-01	8.7E-02	FED AWQC	**1.7E+00**
AOI B	INORG	Aluminum	T	7	4	1.27E-01	3.60E+00	8.7E-02	FED AWQC	**4.1E+01**
AOI B	INORG	Antimony	T	7	1	1.90E-03	1.90E-03	8.0E-02	USEPA R5	2.4E-02
AOI B	INORG	Arsenic	T	7	3	4.20E-03	7.80E-03	1.5E-01	Ohio EPA	5.2E-02
AOI B	INORG	Barium	D	7	7	3.07E-02	7.33E-02	2.2E-01	USEPA R5	3.3E-01
AOI B	INORG	Barium	T	7	7	4.63E-02	7.17E-02	2.2E-01	USEPA R5	3.3E-01
AOI B	INORG	Chromium (total)	D	7	1	3.40E-03	3.40E-03	1.4E-01	Ohio EPA	2.4E-02
AOI B	INORG	Chromium (total)	T	7	2	8.10E-03	2.14E-02	1.4E-01	Ohio EPA	1.5E-01
AOI B	INORG	Chromium III	T	7	2	4.10E-03	1.24E-02	7.4E-02	FED AWQC	1.7E-01
AOI B	INORG	Chromium VI	T	7	2	4.00E-03	9.00E-03	1.1E-02	FED AWQC	8.2E-01
AOI B	INORG	Cobalt	T	7	2	1.90E-03	3.40E-03	2.4E-02	USEPA R5	1.4E-01
AOI B	INORG	Copper	T	7	3	6.80E-03	1.46E-02	1.8E-02	Ohio EPA	8.2E-01
AOI B	INORG	Iron	D	7	2	1.71E-01	5.57E-01	1.0E+00	FED AWQC	5.6E-01
AOI B	INORG	Iron	T	7	5	8.49E-02	8.19E+00	1.0E+00	FED AWQC	**8.2E+00**
AOI B	INORG	Lead	T	7	3	2.30E-03	4.70E-03	1.4E-02	Ohio EPA	3.3E-01
AOI B	INORG	Manganese	D	7	6	6.90E-04	3.17E-01		NA	
AOI B	INORG	Manganese	T	7	5	9.40E-02	3.49E-01		NA	
AOI B	INORG	Nickel	T	7	3	5.40E-03	1.33E-02	1.0E-01	Ohio EPA	1.3E-01
AOI B	INORG	Selenium	D	7	1	4.30E-03	4.30E-03	4.6E-03	Ohio EPA	9.3E-01
AOI B	INORG	Selenium	T	7	1	4.60E-03	4.60E-03	4.6E-03	Ohio EPA	1.0E+00
AOI B	INORG	Thallium	D	8	1	5.70E-03	5.70E-03	1.0E-02	USEPA R5	5.7E-01
AOI B	INORG	Vanadium	T	7	3	3.40E-03	1.15E-02	1.2E-02	USEPA R5	9.6E-01
AOI B	INORG	Zinc	T	7	4	2.90E-02	7.20E-02	2.3E-01	Ohio EPA	3.1E-01

a. With the exception of beryllium, the hardness dependent criteria are calculated using the equations for OMZA criteria shown on Table 7-9 of the statewide water quality standards (Chapter 3745-1, http://www.epa.state.oh.us/portals/35/rules/01-07.pdf). The beryllium criterion was calculated using the OMZA equation in the footnote of the Tier I/Tier II summary table (http://www.epa.state.oh.us/portals/35/wqs/Ohioval13.pdf).
Only constituents detected in each area are shown.
Ratios of concentration to the criteria greater than 1 are shaded in bold.
Chem Group - chemical group
Meas Basis - measured basis; T = total, D = dissolved

Table 5a. Surface Soil Ecological Screening
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Soil Screening Value (mg/kg)		Ratio of Max Detect to Soil Screening Value
AOI C	VOC	Acetone	6	5	9.60E-03	2.70E-01	2.5E+00	USEPA R5	1.1E-01
AOI C	VOC	2-Butanone	6	5	4.00E-03	7.60E-02	9.0E+01	USEPA R5	8.5E-04
AOI C	VOC	Carbon Disulfide	6	2	1.90E-03	8.40E-03	9.4E-02	USEPA R5	8.9E-02
AOI C	VOC	Methylene Chloride	6	2	8.80E-04	1.70E-03	4.1E+00	USEPA R5	4.2E-04
AOI C	VOC	Tetrachloroethene	6	2	4.00E-03	4.00E-03	9.9E+00	USEPA R5	4.0E-04
AOI C	VOC	Toluene	6	3	1.60E-03	1.60E-02	5.5E+00	USEPA R5	2.9E-03
AOI C	VOC	Trichloroethene	6	1	3.40E-03	3.40E-03	1.2E+01	USEPA R5	2.7E-04
AOI C	SVOC	Anthracene	6	1	2.20E-02	2.20E-02	1.5E+03	USEPA R5	1.5E-05
AOI C	SVOC	Benzo(a)anthracene	6	4	6.00E-02	1.60E-01	5.2E+00	USEPA R5	3.1E-02
AOI C	SVOC	Benzo(a)pyrene	6	4	6.50E-02	1.60E-01	1.5E+00	USEPA R5	1.1E-01
AOI C	SVOC	Benzo(b)fluoranthene	6	4	9.00E-02	2.50E-01	6.0E+01	USEPA R5	4.2E-03
AOI C	SVOC	Benzo(g,h,i)perylene	6	4	5.20E-02	1.30E-01	1.2E+02	USEPA R5	1.1E-03
AOI C	SVOC	Benzo(k)fluoranthene	6	4	4.00E-02	1.30E-01	1.5E+02	USEPA R5	8.8E-04
AOI C	SVOC	bis(2-Ethylhexyl)phthalate	6	2	5.40E-02	3.10E-01	9.3E-01	USEPA R5	3.4E-01
AOI C	SVOC	Chrysene	6	4	9.00E-02	2.10E-01	4.7E+00	USEPA R5	4.4E-02
AOI C	SVOC	Fluoranthene	6	4	1.60E-01	3.80E-01	1.2E+02	USEPA R5	3.1E-03
AOI C	SVOC	Indeno(1,2,3-cd)pyrene	6	4	4.10E-02	1.10E-01	1.1E+02	USEPA R5	1.0E-03
AOI C	SVOC	Methylphenol (total)	6	1	6.80E-01	6.80E-01	3.5E+00	USEPA R5	1.9E-01
AOI C	SVOC	3-Methylphenol	6	1	3.40E-01	3.40E-01	3.5E+00	USEPA R5	9.7E-02
AOI C	SVOC	4-Methylphenol	6	1	3.40E-01	3.40E-01	1.6E+02	USEPA R5	2.1E-03
AOI C	SVOC	Phenanthrene	6	4	6.40E-02	1.60E-01	4.6E+01	USEPA R5	3.5E-03
AOI C	SVOC	Pyrene	6	4	1.40E-01	3.20E-01	7.9E+01	USEPA R5	4.1E-03
AOI C	INORG	Aluminum	6	6	4.85E+03	7.91E+03		NA	
AOI C	INORG	Arsenic	6	6	1.20E+00	4.50E+00	1.8E+01	Eco SSL	2.5E-01
AOI C	INORG	Barium	6	6	3.65E+01	8.23E+01	3.3E+02	Eco SSL	2.5E-01
AOI C	INORG	Beryllium	6	6	2.30E-01	4.60E-01	2.1E+01	Eco SSL	2.2E-02
AOI C	INORG	Cadmium	6	6	2.10E-01	1.20E+00	3.6E-01	Eco SSL	**3.3E+00**
AOI C	INORG	Chromium (total)	6	6	7.30E+00	1.35E+01	4.0E-01	USEPA R5	**3.4E+01**
AOI C	INORG	Cobalt	6	6	2.80E+00	6.20E+00	1.3E+01	Eco SSL	4.8E-01
AOI C	INORG	Copper	6	6	1.38E+01	3.49E+01	2.8E+01	Eco SSL	**1.2E+00**
AOI C	INORG	Iron	6	6	6.48E+03	1.57E+04		NA	
AOI C	INORG	Lead	6	6	9.60E+00	8.79E+01	1.1E+01	Eco SSL	**8.0E+00**
AOI C	INORG	Manganese	6	6	5.28E+01	1.62E+02	2.2E+02	Eco SSL	7.4E-01
AOI C	INORG	Mercury	6	6	2.40E-02	1.70E-01	1.0E-01	USEPA R5	**1.7E+00**
AOI C	INORG	Nickel	6	6	8.10E+00	1.65E+01	3.8E+01	Eco SSL	4.3E-01
AOI C	INORG	Selenium	6	4	2.10E+00	4.10E+00	5.2E-01	Eco SSL	**7.9E+00**
AOI C	INORG	Vanadium	6	6	1.14E+01	2.15E+01	7.8E+00	Eco SSL	**2.8E+00**
AOI C	INORG	Zinc	6	6	4.09E+01	1.13E+02	4.6E+01	Eco SSL	**2.5E+00**
SWMU 23	VOC	1,2-Dichlorobenzene	12	1	8.20E-02	8.20E-02	3.0E+00	USEPA R5	2.8E-02
SWMU 23	VOC	Toluene	12	2	1.10E-03	1.90E-03	5.5E+00	USEPA R5	3.5E-04

Table 5a. Surface Soil Ecological Screening
Bway Corporation, Cincinnati, OH

Area	Chem Group	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Soil Screening Value (mg/kg)		Ratio of Max Detect to Soil Screening Value
SWMU 23	SVOC	Benzo(a)anthracene	12	1	1.30E-02	1.30E-02	5.2E+00	USEPA R5	2.5E-03
SWMU 23	SVOC	Benzo(a)pyrene	12	1	1.70E-02	1.70E-02	1.5E+00	USEPA R5	1.1E-02
SWMU 23	SVOC	Benzo(b)fluoranthene	12	2	1.30E-02	2.50E-02	6.0E+01	USEPA R5	4.2E-04
SWMU 23	SVOC	Benzo(g,h,i)perylene	12	1	1.50E-02	1.50E-02	1.2E+02	USEPA R5	1.3E-04
SWMU 23	SVOC	bis(2-Ethylhexyl)phthalate	12	1	2.30E-02	2.30E-02	9.3E-01	USEPA R5	2.5E-02
SWMU 23	SVOC	Chrysene	12	1	1.80E-02	1.80E-02	4.7E+00	USEPA R5	3.8E-03
SWMU 23	SVOC	Fluoranthene	12	3	1.50E-02	3.70E-02	1.2E+02	USEPA R5	3.0E-04
SWMU 23	SVOC	Phenanthrene	12	1	1.80E-02	1.80E-02	4.6E+01	USEPA R5	3.9E-04
SWMU 23	SVOC	Pyrene	12	2	1.40E-02	2.90E-02	7.9E+01	USEPA R5	3.7E-04
SWMU 23	INORG	Aluminum	12	12	2.59E+03	2.09E+04		NA	
SWMU 23	INORG	Arsenic	13	13	2.90E+00	1.42E+01	1.8E+01	Eco SSL	7.9E-01
SWMU 23	INORG	Barium	12	12	1.26E+01	9.82E+01	3.3E+02	Eco SSL	3.0E-01
SWMU 23	INORG	Beryllium	12	11	4.60E-02	6.80E-01	2.1E+01	Eco SSL	3.2E-02
SWMU 23	INORG	Cadmium	12	12	1.60E-01	2.40E-01	3.6E-01	Eco SSL	6.7E-01
SWMU 23	INORG	Chromium (total)	12	12	4.70E+00	2.42E+01	4.0E-01	USEPA R5	**6.1E+01**
SWMU 23	INORG	Chromium III	12	12	3.83E+00	2.16E+01	2.6E+01	Eco SSL	8.3E-01
SWMU 23	INORG	Chromium VI	12	12	5.70E-01	3.00E+00	1.3E+02	Eco SSL	2.3E-02
SWMU 23	INORG	Cobalt	12	12	2.50E+00	9.90E+00	1.3E+01	Eco SSL	7.6E-01
SWMU 23	INORG	Copper	12	12	7.50E+00	2.23E+01	2.8E+01	Eco SSL	8.0E-01
SWMU 23	INORG	Iron	12	12	6.93E+03	3.01E+04		NA	
SWMU 23	INORG	Lead	12	11	3.00E+00	1.66E+01	1.1E+01	Eco SSL	**1.5E+00**
SWMU 23	INORG	Manganese	12	12	2.57E+02	1.09E+03	2.2E+02	Eco SSL	**5.0E+00**
SWMU 23	INORG	Mercury	12	9	1.60E-02	7.40E-02	1.0E-01	USEPA R5	7.4E-01
SWMU 23	INORG	Nickel	12	12	6.30E+00	2.04E+01	3.8E+01	Eco SSL	5.4E-01
SWMU 23	INORG	Thallium	12	1	5.80E-01	5.80E-01	5.7E-02	USEPA R5	**1.0E+01**
SWMU 23	INORG	Vanadium	12	12	7.90E+00	4.17E+01	7.8E+00	Eco SSL	**5.3E+00**
SWMU 23	INORG	Zinc	12	12	1.99E+01	7.30E+01	4.6E+01	Eco SSL	**1.6E+00**

Only constituents detected in each area are shown.
The concentrations for the Methylphenol isomers (2, 3, & 4) were summed before comparing to criteria.
The lowest criteria for the isomers is used as a surrogate criteria for total methylphenol.
Ratios of concentration to the criteria greater than 1 are shaded in bold.
Chem Group - chemical group
mg/kg: milligrams per kilograms
SVOC: Semivolatile organic compound

Table 5b. Surface Soil Background Comparison
Bway Corporation, Cincinnati, OH

Area	Chemical	Analyzed	Detected	Max Detected (mg/kg)	Background (mg/kg)	Ratio of Max Detect to Background
AOI C	Aluminum	6	6	7.91E+03	NA	
AOI C	Cadmium	6	6	1.20E+00	1.25E+00	9.6E-01
AOI C	Chromium (total)	6	6	1.35E+01	2.20E+01	6.1E-01
AOI C	Copper	6	6	3.49E+01	2.80E+01	**1.2E+00**
AOI C	Iron	6	6	1.57E+04	1.84E+04	8.5E-01
AOI C	Lead	6	6	8.79E+01	3.70E+01	**2.4E+00**
AOI C	Mercury	6	6	1.70E-01	1.30E-01	**1.3E+00**
AOI C	Selenium	6	4	4.10E+00	5.60E-01	**7.3E+00**
AOI C	Vanadium	6	6	2.15E+01	8.80E+01	2.4E-01
AOI C	Zinc	6	6	1.13E+02	9.00E+01	**1.3E+00**
SWMU 23	Aluminum	12	12	2.09E+04	NA	
SWMU 23	Chromium (total)	12	12	2.42E+01	2.20E+01	**1.1E+00**
SWMU 23	Chromium III	12	12	2.16E+01	NA	
SWMU 23	Chromium VI	12	12	3.00E+00	NA	
SWMU 23	Iron	12	12	3.01E+04	1.84E+04	**1.6E+00**
SWMU 23	Lead	12	11	1.66E+01	3.70E+01	4.5E-01
SWMU 23	Manganese	12	12	1.09E+03	4.59E+02	**2.4E+00**
SWMU 23	Thallium	12	1	5.80E-01	NA	
SWMU 23	Vanadium	12	12	4.17E+01	8.80E+01	4.7E-01
SWMU 23	Zinc	12	12	7.30E+01	9.00E+01	8.1E-01

mg/kg: milligrams per kilograms
NA: not available

Table 5c. Refined Surface Soil Screening Evaluation
Bway Corporation, Cincinnati, OH

Area	Chemical	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Ecological SSLs for Avian Wildlife (mg/kg)	Ratio of Max Detect to Eco SSLs for Avian Wildlife	Ecological SSLs for Soil Invertebrates (mg/kg)	Ratio of Max Detect to Eco SSLs for Soil Invertebrates	Ecological SSLs for Mammalian Wildlife (mg/kg)	Ratio of Max Detect to Eco SSLs for Mammalian Wildlife	Ecological SSLs for Terrestrial Plants (mg/kg)	Ratio of Max Detect to Eco SSLs for Terrestrial Plants	Region 5 Soil ESL (mg/kg)	Ratio of Max Detect to Region 5 Soil ESL	ORNL Eco Soil PRG (mg/kg)	Ratio of Max Detect to ORNL Eco Soil PRG
AOI C	Aluminum	6	6	4.85E+03	7.91E+03												
AOI C	Copper	6	6	1.38E+01	3.49E+01	2.8E+01	**1.2E+00**	8.0E+01	4.4E-01	4.9E+01	7.1E-01	7.0E+01	5.0E-01	5.4E+00	**6.5E+00**	6.0E+01	5.8E-01
AOI C	Lead	6	6	9.60E+00	8.79E+01	1.1E+01	**8.0E+00**	1.7E+03	5.2E-02	5.6E+01	**1.6E+00**	1.2E+02	7.3E-01	5.4E-02	**1.6E+03**	4.1E+01	**2.2E+00**
AOI C	Mercury	6	6	2.40E-02	1.70E-01									1.0E-01	**1.7E+00**	5.1E-04	**3.3E+02**
AOI C	Selenium	6	4	2.10E+00	4.10E+00	1.2E+00	**3.4E+00**	4.1E+00	1.0E+00	6.3E-01	**6.5E+00**	5.2E-01	**7.9E+00**	2.8E-02	**1.5E+02**	2.1E-01	**2.0E+01**
AOI C	Zinc	6	6	4.09E+01	1.13E+02	4.6E+01	**2.5E+00**	1.2E+02	9.4E-01	7.9E+01	**1.4E+00**	1.6E+02	7.1E-01	6.6E+00	**1.7E+01**	8.5E+00	**1.3E+01**
SWMU 23	Aluminum	12	12	2.59E+03	2.09E+04												
SWMU 23	Chromium (total)	12	12	4.70E+00	2.42E+01									4.0E-01	**6.1E+01**	4.0E-01	**6.1E+01**
SWMU 23	Chromium III	12	12	3.83E+00	2.16E+01	2.6E+01	8.3E-01			3.4E+01	6.4E-01						
SWMU 23	Chromium VI	12	12	5.70E-01	3.00E+00					1.3E+02	2.3E-02						
SWMU 23	Iron	12	12	6.93E+03	3.01E+04												
SWMU 23	Manganese	12	12	2.57E+02	1.09E+03	4.3E+03	2.5E-01	4.5E+02	**2.4E+00**	4.0E+03	2.7E-01	2.2E+02	**5.0E+00**				
SWMU 23	Thallium	12	1	5.80E-01	5.80E-01									5.7E-02	**1.0E+01**	1.0E+00	5.8E-01

Only constituents detected in each area are shown.
Ratios of concentration to the criteria greater than 1 are shaded in bold.
Eco SSLs: Ecological Soil Screening Level
ESL: Ecological Screening Level
mg/kg: milligrams per kilogram
ORNL: Oak Ridge National Laboratory

Table 6. Sediment Quality Benchmark Determination for Selected Volatile Organic Compounds
Bway Corporation, Cincinnati, Ohio

Chemical	Area	Water Quality Benchmark (WQB) (mg/L)	WQB Basis	log Kow[a]	log Koc[b]	Koc	Fraction Organic Carbon[c] (foc)	Fraction Solids[d] (f_{solids})	Sediment Quality Benchmark (SQB)[e] (mg/kg)
Acetone	SWMU 22	1.7	ESL	-0.24	-0.24	0.58	0.24	0.26	5.2
Acetone	AOI B	1.7	ESL	-0.24	-0.24	0.58	0.018	0.62	1.1
Acetone	AOI C	1.7	ESL	-0.24	-0.24	0.58	0.12	0.29	4.2
Acetonitrile	SWMU 22	12	ESL	-0.15	-0.15	0.71	0.24	0.26	37
2-butanone	SWMU 22	2.2	ESL	0.26	0.26	1.8	0.24	0.26	7.4
Xylenes	SWMU 22	0.027	ESL	3.1	3.0	1085	0.24	0.26	7.0

a. Values are from USEPA's KOWWIN, EPI Suite v3.10.
b. Determined from the log Kow by the following equation (Di Toro et al. 1991): log Koc = 0.00028+(0.983*log Kow)
c. Site-specific average of downstream organic carbon concentrations.
d. Site-specific average of downstream solids content.
e. SQB calculated by the following equation (Fuchsman 2003): $SQB = WQB \times \left[(K_{oc} \times f_{oc}) + \left(\frac{1 - f_{solids}}{f_{solids}} \right) \right]$
f. USEPA's (1993b) FCV for 2,4-dimethylphenol is used as a conservative surrogate.

ESL	USEPA Region V (2003) ecological screening level
FCV	Final Chronic Value
log Kow	Chemical-specific octanol-water partition coefficient
mg/kg	Milligram per Kilogram
mg/L	Milligram per Liter
USEPA	United States Environmental Protection Agency

Table 7. Exposure Point Concentrations for Wildlife Receptors
Bway Corporation, Cincinnati, Ohio

Chemical	Maximum Sediment Concentration (mg/kg dw)	Sediment to Aquatic Plant BAF	Estimated Aquatic Plant Concentration[a] (mg/kg ww)	Sediment to Aquatic Invertebrate BAF	Estimated Aquatic Invertebrate Concentration[a] (mg/kg ww)	Sediment to Fish BAF	Estimated Fish Concentration[a] (mg/kg ww)
SWMU 22 (Process Pond)							
PAHs							
LPAHs	45	0.20 [b]	1.8	0.22 [d]	2.0	---	---
HPAHs	6.1	0.72 [b]	0.88	0.22 [d]	0.27	---	---
Chromium	199	0.041 [c]	1.6	0.056 [e]	2.2	---	---
Copper	920	0.030 [c]	5.5	0.089 [e]	16	---	---
Lead	55	0.046 [c]	0.50	0.075 [e]	0.83		
Nickel	74	0.037 [c]	0.55	0.49 [e]	7.3	---	---
Silver	13	0.014 [c]	0.037	1.7 [l]	4.5	---	---
Zinc	1940	0.35 [c]	136	0.16 [e]	62	---	---
AOI B (Quarry Pond)							
PAHs							
LPAHs	7.6	0.39 [b]	0.60	0.22 [d]	0.34	1.4 [g]	2.2
HPAHs	89	0.72 [b]	13	0.22 [d]	4.0	1.4 [g]	26
Zinc	453	0.33 [c]	30	0.50 [e]	45	0.00017 [h]	0.016
AOI C (Wetlands)							
PAHs							
LPAHs	1.1	0.82 [b]	0.18	0.22 [d]	0.049	---	---
HPAHs	3.0	0.72 [b]	0.43	0.22 [d]	0.13	---	---
Cadmium	1.2	0.57 [c]	0.14	1.0 [e]	0.25	---	---
Copper	39	0.21 [c]	1.6	0.88 [e]	6.8	---	---
Lead	57	0.045 [c]	0.51	0.075 [e]	0.85	---	---
Mercury	0.14	0.91 [c]	0.025	1.1 [e]	0.032	---	---
Selenium	5.4	0.61 [c]	0.65	0.90 [f]	1.0	---	---
Zinc	110	0.61 [c]	14	1.52 [e]	34	---	---

Chemical	Maximum Soil Concentration[m] (mg/kg dw)	Soil to Terrestrial Plant BAF	Estimated Terrestrial Plant Concentration[a] (mg/kg ww)	Soil to Terrestrial Invertebrate BAF	Estimated Terrestrial Invertebrate Concentration[a] (mg/kg ww)	Soil to Small Mammal BAF	Estimated Small Mammal Concentration (mg/kg ww)
AOI C (Wetlands)							
PAHs							
LPAHs	0.17	1.7 [b]	0.057	23 [b]	0.78	--- [b,j]	0
HPAHs	1.8	0.72 [b]	0.26	3.0 [b]	1.1	--- [b,j]	0
Cadmium[n]	0	--- [c]	0	--- [i]	0	--- [b]	0
Copper	7	0.60 [c]	0.8	0.52 [i]	0.7	1.48 [b]	2.0
Lead	51	0.047 [c]	0.48	0.38 [i]	3.9	0.121 [b]	1.2
Mercury	0.040	1.62 [c]	0.013	1.7 [i]	0.014	0.000071 [b]	0.00000057
Selenium	3.5	0.58 [c]	0.41	0.66 [b]	0.47	0.30 [b]	0.21
Zinc	23	1.19 [c]	5	10.4 [i]	48	4.3 [b]	20

a. Includes a dw:ww conversion factor of 0.2 (Boese and Lee 1992)
b. USEPA 2005a
c. Efroymson et al. 2001
d. Tracey and Hansen 1996
e. Bechtel Jacobs 1998
f. USEPA 1999
g. WA DOE 1997
h. Krantzberg 1994; USEPA 2000
i. Sample et al. 1999
j. Assumed to be negligible
k. Sample et al. 1998
l. Garnier-Laplace et al. 1992
m. Soil concentrations for metals are the maximum detected concentrations minus the background concentration.
n. The maximum detected concentration of cadmium in soil is less than the background concentration.

BAF: bioaccumulation factor
dw: dry weight
HPAHs: high molecular weight PAHs
LPAHs: low molecular weight PAHs
mg/kg: milligrams per kilogram
PAHs: polycyclic aromatic hydrocarbons
ww: wet weight

Table 8. Calculation of Food Ingestion Rates for Wildlife Receptors
Bway Corporation, Cincinnati, Ohio

k Prey type	P_k Proportion of Diet (percent)	GE Gross Energy (kcal/g ww)	AE Assimilation Efficiency (percent)	ME_k Metabolic Energy[a] (kcal/g ww)	NFMR Normalized Free-living Metabolic Rate (kcal/kg-d)	NIR_{total} Total Normalized Ingestion Rate[b] (g/kg-d)	NIR_{total} Total Normalized Ingestion Rate (g/g-d)	BW Body Weight (kg)	FIR Food Ingestion Rate[c] (kg/day)
SWMU 22 (Process Pond)									
Mallard					196 [i]	338	0.34	1.2 [j]	0.39
Aquatic Plants	25% [d]	0.56 [e]	23% [g]	0.13					
Aquatic Invertebrates	75% [d]	0.95 [f]	77% [h]	0.73					
AOI B (Quarry Pond)									
Mallard					196 [i]	338	0.34	1.2 [j]	0.39
Aquatic Plants	25% [d]	0.56 [e]	23% [g]	0.13					
Aquatic Invertebrates	75% [d]	0.95 [f]	77% [h]	0.73					
Raccoon					185 [i]	285	0.28	5.8 [j]	1.6
Aquatic Plants	44% [k]	0.56 [e]	76% [l]	0.43					
Aquatic Invertebrates	56% [k]	0.95 [f]	87% [m]	0.83					
Great Blue Heron					165 [q]	181	0.18	2.3 [j]	0.42
Aquatic Invertebrates	16% [n]	0.95 [f]	77% [h]	0.73					
Fish	84% [n]	1.2 [o]	79% [p]	0.95					
AOI C (Wetlands)									
Mallard					196 [i]	297	0.30	1.2 [j]	0.34
Aquatic Plants	19% [d,r]	0.56 [e]	23% [g]	0.13					
Terrestrial Plants	6% [d,r]	1.4 [s]	59% [u]	0.83					
Aquatic Invertebrates	56% [d,r]	0.95 [f]	77% [h]	0.73					
Terrestrial Invertebrates	19% [d,r]	1.3 [t]	72% [v]	0.94					
Raccoon					185 [i]	211	0.21	5.8 [j]	1.2
Aquatic Plants	22% [k,w]	0.56 [e]	76% [l]	0.43					
Terrestrial Plants	22% [k,w]	1.4 [s]	76% [l]	1.1					
Aquatic Invertebrates	28% [k,w]	0.95 [f]	87% [m]	0.83					
Terrestrial Invertebrates	28% [k,w]	1.3 [t]	87% [m]	1.1					
American Robin					713 [i]	797	0.80	0.77 [j]	0.62
Terrestrial Plants	11% [j,cc]	1.1 [dd]	51% [ee]	0.56					
Terrestrial Invertebrates	89% [j,cc]	1.3 [t]	72% [v]	0.94					
Short-tailed Shrew					640 [i]	581	0.58	0.017 [j]	0.010
Terrestrial Plants	15% [k]	1.1 [dd]	85% [ff]	0.94					
Terrestrial Invertebrates	85% [k]	1.3 [t]	87% [m]	1.1					
Red-tailed Hawk					197 [i]	148	0.15	1.1 [j]	0.17
Small Mammals	100% [j]	1.7 [y]	78% [z]	1.3					

Table 8. Calculation of Food Ingestion Rates for Wildlife Receptors Bway Corporation, Cincinnati, Ohio									
Red Fox					165 [i]	122	0.12	4.5 [j]	0.55
Aquatic Plants	5% [aa]	0.56 [e]	76% [l]	0.43					
Terrestrial Plants	5% [aa]	1.4 [s]	76% [l]	1.1					
Terrestrial Invertebrates	5% [aa]	1.3 [t]	87% [m]	1.1					
Small Mammals	85% [aa]	1.7 [y]	84% [bb]	1.4					

a. $ME_k = GE \times AE$
b. $NIR = NFMR/(\sum P_k \times ME_k)$
c. FIR = NIR (g/g-day) x BW
d. Swanson et al. (1985) report that invertebrates make up an average of 75% of mallard diet during breeding season (as cited in USEPA 1993)
e. Wet weight conversion of aquatic macrophyte gross energy (USEPA 1993)
f. Mean of values reported for aquatic invertebrates (USEPA 1993)
g. Value for birds eating aquatic vegetation (USEPA 1993)
h. Value for waterfowl eating aquatic invertebrates (USEPA 1993)
i. Average male and female free-living metabolic rate (USEPA 1993)
j. USEPA (1993)
k. Value based on average spring and summer diet in USEPA (1993), assuming no higher trophic level organisms (i.e., amphibians, rodents) in diet.
l. Value for rabbits/voles/rats and herbivory (USEPA 1993)
m. Value for small mammals consuming insects (USEPA 1993)
n. Henning et al. 1999
o. Value for bony fishes (USEPA 1993)
p. Value for seabirds eating fish (USEPA 1993)
q. Free-living metabolic rate (USEPA 1993)
r. Assumed that mallards obtain 75% of their diet from aquatic sources and the remaining 25% from terrestrial sources
s. Average of wet weight adjusted gross efficiencies for all terrestrial plants (USEPA 1993)
t. Average terrestrial invertebrate value (USEPA 1993)
u. Value for non-passerines eating wild seeds (USEPA 1993); Swanson et al. (1985; as cited in USEPA 1993) report that seeds constitute more than 85% of the plant material in mallard diets
v. Value for birds eating terrestrial insects (USEPA 1993)
w. Assume 50% of diet comes from aquatic and 50% from terrestrial sources
x. Small mammals used as surrogate for small proportion of other prey items, such as birds, amphibians, and reptiles
y. Average small mammal value (USEPA 1993)
z. Value for birds of prey eating birds/small mammals (USEPA 1993)
aa. Average of spring and summer (breeding season) adult diet percentages (USEPA 1993)
bb. Value for mammals consuming small birds/mammals (USEPA 1993)
cc. Wheelwright 1986
dd. Value for fruit (USEPA 1993)
ee. Value for birds and fruit pulp, skin, and seeds (USEPA 1993)
ff. Value for voles and mice eating seeds and nuts (USEPA 1993)

kcal/g ww: kilocalorie per gram (wet weight)
kcal/kg-d: kilocalorie per kilogram per day

kcal/kJ: kilocalorie per kilojoules
g/kg-d: gram per kilogram per day
g/g-d: gram per gram per day
kg: kilogram
kg/day: kilogram per day

Table 9. Calculation of Total Daily Intakes for Wildlife Receptors in SWMU 22

Bway Corporation, Cincinnati, Ohio

Chemical	Proportion of Diet: Aquatic Plants	Proportion of Diet: Aquatic Invertebrates (percent)	Proportion of Diet: Fish	FIR Food Ingestion Rate (kg/day)	SIR Sediment/ Soil Ingestion Rate[a] (kg/day)	BW Body Weight (kg)	AUF Area Use Factor[b] (unitless)	TDI Total Daily Intake[c] (mg/kg-day)
Mallard	25%	75%	0%	0.39	0.0026	1.2	0.1	
LPAHs								0.075
HPAHs								0.016
Chromium								0.11
Copper								0.67
Lead								0.038
Nickel								0.21
Silver								0.12
Zinc								3.2

a. Ingestion rates from Beyer et al. 1994, using a dry weight to wet weight conversion factor of 0.2 (Boese and Lee 1992)
b. Conservative AUF
c. $TDI = \sum((FIR \times Ci \times Pi)+(SIR \times Csl)) \times 1/BW \times AUF$
where: Ci = concentration in ith prey item
Pi = proportion of ith prey item
Csl = concentration in sediment
d. Assumed negligible

HPAHs: high molecular weight PAHs
kg: kilogram
kg/day: kilogram per day
LPAHs: low molecular weight PAHs
mg/kg-day: milligram per kilogram per day
PAHs: polycyclic aromatic hydrocarbons

Table 10. Calculation of Total Daily Intakes for Wildlife Receptors in AOI B

Bway Corporation, Cincinnati, Ohio

	Proportion of Diet			FIR	SIR	BW	AUF	TDI
Chemical	Aquatic Plants	Aquatic Invertebrates (percent)	Fish	Food Ingestion Rate (kg/day)	Sediment/ Soil Ingestion Rate[a] (kg/day)	Body Weight (kg)	Area Use Factor[b] (unitless)	Total Daily Intake[c] (mg/kg-day)
Mallard	25%	75%	0%	0.39	0.0026	1.2	0.1	
LPAHs								0.015
HPAHs								0.23
Zinc								1.5
Raccoon	44%	56%	0%	1.6	0.015	5.8	0.1	
LPAHs								0.015
HPAHs								0.25
Zinc								1.2
Great Blue Heron	0%	16%	84%	0.42	--- [d]	2.3	0.1	
LPAHs								0.035
HPAHs								0.40
Zinc								0.13

a. Ingestion rates from Beyer et al. 1994, using a dry weight to wet weight conversion factor of 0.2 (Boese and Lee 1992)
b. Conservative AUF
c. *TDI = ∑((FIR x Ci x Pi)+(SIR x Csl)) x 1/BW x AUF*
where: Ci = concentration in ith prey item
Pi = proportion of ith prey item
Csl = concentration in sediment
d. Assumed negligible

HPAHs: high molecular weight PAHs
kg: kilogram
kg/day: kilogram per day
LPAHs: low molecular weight PAHs
mg/kg-day: milligram per kilogram per day
PAHs: polycyclic aromatic hydrocarbons

Table 11. Calculation of Total Daily Intakes for Wildlife Receptors in AOI C

Bway Corporation, Cincinnati, Ohio

Chemical	Proportion of Diet (percent): Aquatic Plants	Terrestrial Plants	Aquatic Invertebrates	Terrestrial Invertebrates	Small Mammals	FIR Food Ingestion Rate (kg/day)	SIR Sediment/ Soil Ingestion Rate[a] (kg/day)	BW Body Weight (kg)	AUF Area Use Factor[b] (unitless)	TDI Total Daily Intake[c] (mg/kg-day)
Mallard	19%	6%	56%	19%	0%	0.34	0.0011 [d]	1.2	0.1	
LPAHs										0.0064
HPAHs										0.012
Cadmium										0.0050
Copper										0.13
Lead										0.045
Mercury										0.00078
Selenium										0.024
Zinc										0.92
Raccoon	22%	22%	28%	28%	0%	1.2	0.011 [d]	5.8	0.1	
LPAHs										0.0061
HPAHs										0.011
Cadmium										0.0022
Copper										0.060
Lead										0.044
Mercury										0.00046
Selenium										0.014
Zinc										0.58
American Robin	0%	11%	0%	89%	0%	0.6	0.01 [d]	0.77	1	
LPAHs										0.56
HPAHs										0.83
Cadmium										0
Copper										0.70
Lead										3.7
Mercury										0.011
Selenium										0.43
Zinc										35
Short-tailed Shrew	0%	15%	0%	85%	0%	0.010	0.0003 [d]	0.017	1	
LPAHs										0.010
HPAHs										0.045
Cadmium										0
Copper										0.14
Lead										1.0
Mercury										0.00092
Selenium										0.074
Zinc										0.86

Table 11. Calculation of Total Daily Intakes for Wildlife Receptors in AOI C

Bway Corporation, Cincinnati, Ohio

Chemical	Proportion of Diet: Aquatic Plants	Terrestrial Plants	Aquatic Invertebrates	Terrestrial Invertebrates	Small Mammals	FIR Food Ingestion Rate (kg/day)	SIR Sediment/ Soil Ingestion Rate[a] (kg/day)	BW Body Weight (kg)	AUF Area Use Factor[b] (unitless)	TDI Total Daily Intake[c] (mg/kg-day)
			(percent)							
Red-tailed Hawk	0%	0%	0%	0%	100%	0.17	--- [e]	1.1	0.1	
LPAHs										0
HPAHs										0
Cadmium										0
Copper										0.030
Lead										0.018
Mercury										0.000000008
Selenium										0.0031
Zinc										0.29
Red Fox	5%	5%	0%	5%	85%	0.55	0.0031	4.5	0.1	
LPAHs										0
HPAHs										0
Cadmium										0.000084
Copper										0.0024
Lead										0.0050
Mercury										0.000032
Selenium										0.0010
Zinc										0.055

a. Ingestion rates from Beyer et al. 1994, using a dry weight to wet weight conversion factor of 0.2 (Boese and Lee 1992)
b. Conservative AUF
c. *TDI = ∑((FIR x Ci x Pi)+(SIR x Csl)) x 1/BW x AUF*
where: Ci = concentration in ith prey item
Pi = proportion of ith prey item
Csl = concentration in sediment
d. Assumed 50% from sediment and 50% from soil
e. Assumed negligible

HPAHs: high molecular weight PAHs
kg: kilogram
kg/day: kilogram per day
LPAHs: low molecular weight PAHs
mg/kg-day: milligram per kilogram per day
PAHs: polycyclic aromatic hydrocarbons

Table 12. Estimate of Risk for Wildlife Receptors Based on NOAEL Values
Bway Corporation, Cincinnati, Ohio

	Mallard			Raccoon			Great Blue Heron			American Robin			Short-tailed Shrew			Red-tailed Hawk			Red Fox		
Chemical	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)
SWMU 22 (Process Pond)																					
LPAHs	0.075	1653 [c]	0.00005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
HPAHs	0.016	2 [c]	0.008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	0.11	2.66 [c]	0.04	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper	0.67	4.05 [c]	0.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead	0.038	1.63 [c]	0.02																		
Nickel	0.21	6.71 [c]	0.03	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Silver	0.12	2.02 [c]	0.06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	3.2	66.1 [c]	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AOI B (Quarry Pond)																					
LPAHs	0.015	1653 [c]	0.000009	0.015	50 [g]	0.0003	0.035	1653 [c]	0.00002	---	---	---	---	---	---	---	---	---	---	---	---
HPAHs	0.23	2 [c]	0.1	0.25	0.615 [c]	0.4	0.40	2 [c]	0.2	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	1.5	66.1 [c]	0.02	1.2	75.4 [c]	0.02	0.13	66.1 [c]	0.002	---	---	---	---	---	---	---	---	---	---	---	---
AOI C (Wetlands)																					
LPAHs	0.0064	1653 [c]	0.000004	0.0061	50 [g]	0.0001	---	---	---	0.56	1653 [c]	0.0003	0.010	50 [g]	0.0002	0	1653 [c]	0	0	50 [g]	0
HPAHs	0.012	2 [c]	0.006	0.011	0.615 [c]	0.02	---	---	---	0.83	2 [c]	0.4	0.045	0.615 [c]	0.07	0	2 [c]	0	0	0.615 [c]	0
Cadmium	0.0050	1.47 [c]	0.003	0.0022	0.77 [c]	0.003	---	---	---	0	1.47 [c]	0	0	0.77 [c]	0	0	1.47 [c]	0	0.000084	0.77 [c]	0.0001
Copper	0.13	4.05 [c]	0.03	0.060	5.6 [c]	0.01	---	---	---	0.70	4.05 [c]	0.2	0.14	5.6 [c]	0.03	0.030	4.05 [c]	0.007	0.0024	5.6 [c]	0.0004
Lead	0.045	1.63 [c]	0.03	0.044	4.7 [c]	0.009	---	---	---	3.7	8.31 [c]	0.4	1.0	4.7 [c]	0.2	0.018	8.31 [c]	0.002	0.0050	4.7 [c]	0.001
Mercury	0.00078	0.013 [d]	0.06	0.00046	0.016 [d]	0.03				0.011	0.013 [d]	0.9	0.00092	0.016 [d]	0.06	0.0000000084	0.013 [d]	0.0000006	0.000032	0.016 [d]	0.002
Selenium	0.024	0.40 [e,f]	0.06	0.014	0.143 [c]	0.1	---	---	---	0.43	5.0 [h]	0.09	0.074	0.143 [c]	0.5	0.0031	5.0 [h]	0.0006	0.0010	0.143 [c]	0.007
Zinc	0.92	66.1 [c]	0.01	0.58	75.4 [c]	0.008	---	---	---	35	66.1 [c]	0.5	0.86	75.4 [c]	0.01	0.29	66.1 [c]	0.004	0.055	75.4 [c]	0.0007

a. Based on NOAEL values
b. HQ = TDI/TRV
c. USEPA 2005a
d. USEPA 1995
e. Heinz et al. 1989
f. Stanley et al. 1996
g. NTP 1991
h. Santolo et al. 1999

HQ: hazard quotient
HPAHs: high molecular weight PAHs
LPAHs: low molecular weight PAHs
mg/kg-day: milligram per kilogram per day
PAHs: polycyclic aromatic hydrocarbons
TDI: total daily intake
TRV: toxicity reference value

Table 13. Estimate of Risk for Wildlife Receptors Based on LOAEL Values
Bway Corporation, Cincinnati, Ohio

	Mallard			Raccoon			Great Blue Heron			American Robin			Short-tailed Shrew			Red-tailed Hawk			Red Fox		
Chemical	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)	TDI (mg/kg-day)	TRV[a] (mg/kg-day)	HQ[b] (unitless)
SWMU 22 (Process Pond)																					
LPAHs	0.075	16530 [c,d]	0.000005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
HPAHs	0.016	20 [c]	0.0008	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	0.11	11 [c,e]	0.01	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper	0.67	12.1 [c]	0.06	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nickel	0.21	22 [c,e]	0.009	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Silver	0.12	80 [c,e]	0.001	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	3.2	187 [c,e]	0.02	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
AOI B (Quarry Pond)																					
LPAHs	0.015	16530 [c,d]	0.0000009	0.015	150 [f]	0.0001	0.035	16530 [c,d]	0.000002	---	---	---	---	---	---	---	---	---	---	---	---
HPAHs	0.23	20 [c]	0.01	0.25	3.07 [c]	0.08	0.40	20 [c]	0.02	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	1.5	187 [c,e]	0.008	1.2	292 [c]	0.004	0.13	187 [c,e]	0.0007	---	---	---	---	---	---	---	---	---	---	---	---
AOI C (Wetlands)																					
LPAHs	0.0064	16530 [c,d]	0.0000004	0.0061	150 [f]	0.00004	---	---	---	0.56	16530 [c,d]	0.00003	0.010	150 [f]	0.00007	0	16530 [c,d]	0	0	150 [f]	0
HPAHs	0.012	20 [c]	0.0006	0.011	3.07 [c]	0.004	---	---	---	0.83	20 [c]	0.04	0.045	3.07 [c]	0.01	0	20 [c]	0	0	3.07 [c]	0
Cadmium	0.0050	7.8 [c,e]	0.0006	0.0022	7.7 [c]	0.0003	---	---	---	0	7.8 [c,e]	0	0	7.7 [c]	0	0	7.8 [c,e]	0	0.000084	7.7 [c]	0.00001
Copper	0.13	12.1 [c]	0.01	0.060	9.34 [c]	0.006	---	---	---	0.70	12.1 [c]	0.06	0.14	9.34 [c]	0.02	0.030	12.1 [c]	0.002	0.0024	9.34 [c]	0.0003
Lead	0.045	3.26 [c]	0.01	0.044	8.9 [c]	0.005	---	---	---	3.7	83.1 [c,d]	0.04	1.0	8.9 [c]	0.1	0.018	83.1 [c,d]	0.0002	0.0050	8.9 [c]	0.0006
Mercury	0.00078	0.13 [g,d]	0.00602	0.00046	0.16 [g,d]	0.003				0.011	0.13 [g,d]	0.09	0.00092	0.16 [g,d]	0.006	0.0000000084	0.13 [g,d]	0.00000006	0.000032	0.16 [g,d]	0.0002
Selenium	0.024	0.7 [h,i,j]	0.03	0.014	0.215 [c]	0.07	---	---	---	0.43	50 [k,d]	0.009	0.074	0.215 [c]	0.3	0.0031	50 [k,d]	0.00006	0.0010	0.215 [c]	0.004
Zinc	0.92	187 [c,e]	0.005	0.58	292 [c]	0.002	---	---	---	35	187 [c,e]	0.2	0.86	292 [c]	0.003	0.29	187 [c,e]	0.002	0.055	292 [c]	0.0002

a. Based on LOAEL values
b. HQ = TDI/TRV
c. USEPA 2005a
d. No LOAEL reported; assumed 10 times the NOAEL
e. No NOAEL reported; used geomean of the survival, growth, and reproduction reported LOAELs
f. NTP 1991
g. USEPA 1995
h. Heinz et al. 1989
i. Stanley et al. 1994, 1996
j. Heinz and Fitzgerald 1993
k. Santolo et al. 1999

HQ: hazard quotient
HPAHs: high molecular weight PAHs
LPAHs: low molecular weight PAHs
mg/kg-day: milligram per kilogram per day
PAHs: polycyclic aromatic hydrocarbons
TDI: total daily intake
TRV: toxicity reference value

Table 14. Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Sediment
Bway Corporation, Cincinnati, Ohio

		AOI B SED01-092208			AOI B SED02-092208			AOI B SED03-092308		
		5.7 % Organic Carbon			1.7 % Organic Carbon			1.7 % Organic Carbon		
	Final Chronic Value[a] (µg/goc)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)
Unsubstituted PAHs										
Acenaphthene	491	0.022	0.39	0.00078	0.066	4.0	0.0081	0.013	0.78	0.0016
Acenaphthylene	452	0.010	0.18	0.00039	0.054	3.3	0.0072	0.0087	0.52	0.0012
Anthracene	594	0.067	1.2	0.0020	0.33	20	0.033	0.043	2.6	0.0044
Benz(a)anthracene	841	0.75	13	0.016	4.7	283	0.34	0.47	28	0.034
Benzo(a)pyrene	965	1.2	21	0.022	6.8	410	0.42	0.75	45	0.047
Benzo(b)fluoranthene	979	1.9	33	0.034	11	663	0.68	1.2	72	0.074
Benzo(e)pyrene	967	0.95	17	0.017	5.6	337	0.35	0.62	37	0.039
Benzo(g,h,i)perylene	1,095	1.0	18	0.016	6.3	380	0.35	0.67	40	0.037
Benzo(k)fluoranthene	981	0.64	11	0.011	4.0	241	0.25	0.42	25	0.026
Chrysene	844	1.3	23	0.027	7.9	476	0.56	0.86	52	0.061
Dibenzo(a,h)anthracene	1,123	0.20	3.5	0.0031	1.3	78	0.070	0.13	7.8	0.0070
Fluoranthene	707	3.1	54	0.077	16	964	1.4	1.7	102	0.14
Fluorene	538	0.034	0.60	0.0011	0.14	8.4	0.016	0.019	1.1	0.0021
Indeno(1,2,3-c,d)pyrene	1,115	1.2	21	0.019	7.7	464	0.42	0.82	49	0.044
Naphthalene	385	0.0061	0.11	0.00028	0.013	0.78	0.0020	0.0033 U	0.20	0.00052
Perylene	967	0.28	4.9	0.0051	1.4	84	0.087	0.18	11	0.011
Phenanthrene	596	0.72	13	0.021	4.8	289	0.49	0.50	30	0.051
Pyrene	697	2.1	37	0.053	12	723	1.0	1.3	78	0.11
Alkylated PAHs										
1-Methylnaphthalene	446	0.0029 U	0.050	0.00011	0.0085	0.51	0.0011	0.0033 U	0.20	0.00045
2-Methylnaphthalene	447	0.0029 U	0.050	0.00011	0.0083	0.50	0.0011	0.0033 U	0.20	0.00044
C1-Chrysenes	929	0.35	6.1	0.0066	1.4	84	0.091	0.24	14	0.016
C1-Fluoranthenes/Pyrenes	770	0.53	9.3	0.012	2.0	120	0.16	0.29	17	0.023
C1-Fluorenes	611	0.0081	0.14	0.00023	0.038	2.3	0.0037	0.0033 U	0.20	0.00033
C1-Phenanthrenes/Anthracenes	670	0.20	3.5	0.0052	1.1	66	0.099	0.13	7.8	0.012
C2-Chrysenes	1,008	0.12	2.1	0.0021	0.40	24	0.024	0.068	4.1	0.0041
C2-Fluorenes	686	0.0086	0.15	0.00022	0.040	2.4	0.0035	0.0072	0.43	0.00063
C2-Naphthalenes	510	0.010	0.18	0.00034	0.020	1.2	0.0024	0.0068	0.41	0.00080
C2-Phenanthrenes/Anthracenes	746	0.11	1.9	0.0026	0.56	34	0.045	0.075	4.5	0.0061
C3-Chrysenes	1,112	0.064	1.1	0.0010	0.23	14	0.012	0.040	2.4	0.0022
C3-Fluorenes	769	0.016	0.28	0.00036	0.085	5.1	0.0067	0.012	0.72	0.00094
C3-Naphthalenes	581	0.0085	0.15	0.00026	0.022	1.3	0.0023	0.0033 U	0.20	0.00034
C3-Phenanthrenes/Anthracenes	829	0.055	0.96	0.0012	0.25	15	0.018	0.032	1.9	0.0023
C4-Chrysenes	1,214	0.0029 U	0.050	0.000041	0.084	5.1	0.0042	0.0033 U	0.20	0.00016
C4-Naphthalenes	657	0.0097	0.17	0.00026	0.021	1.3	0.0019	0.0033 U	0.20	0.00030
C4-Phenanthrenes/Anthracenes	913	0.022	0.39	0.00042	0.075	4.5	0.0049	0.013	0.78	0.00086
Total Toxic Units				0.4			**7**			0.8
Effects Benchmark Exceeded?[b]				No			Yes			No

a. USEPA 2003

b. A toxic unit value exceeding 1.0 indicates the potential for toxicity to benthic invertebrates.

mg/kg - milligram per dry weight kilogram
U - not detected
µg/goc - microgram per gram organic carbon

Table 14. Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Sediment
Bway Corporation, Cincinnati, Ohio

		AOI B SED04-092308			AOI B SED05-092408			AOI B SED06-092408		
		0.17 % Organic Carbon			0.65 % Organic Carbon			1.01 % Organic Carbon		
	Final Chronic Value[a] (µg/goc)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)
Unsubstituted PAHs										
Acenaphthene	491	0.0015 U	0.85	0.0017	0.051	7.8	0.016	0.0025 U	0.24	0.00049
Acenaphthylene	452	0.0015 U	0.85	0.0019	0.029	4.5	0.0099	0.0025 U	0.24	0.00054
Anthracene	594	0.0015 U	0.85	0.0014	0.37	57	0.096	0.0025 U	0.24	0.00041
Benz(a)anthracene	841	0.0015 U	0.85	0.0010	2.5	385	0.46	0.010	0.99	0.0012
Benzo(a)pyrene	965	0.0015 U	0.85	0.00088	2.7	415	0.43	0.014	1.4	0.0014
Benzo(b)fluoranthene	979	0.0044	2.6	0.0026	4.1	631	0.64	0.027	2.7	0.0027
Benzo(e)pyrene	967	0.0015 U	0.85	0.00088	2.1	323	0.33	0.016	1.6	0.0016
Benzo(g,h,i)perylene	1,095	0.0015 U	0.85	0.00078	2.3	354	0.32	0.017	1.7	0.0015
Benzo(k)fluoranthene	981	0.0015 U	0.85	0.00087	1.5	231	0.24	0.0094	0.93	0.00095
Chrysene	844	0.0035	2.1	0.0024	3.2	492	0.58	0.021	2.1	0.0025
Dibenzo(a,h)anthracene	1,123	0.0015 U	0.85	0.00076	0.49	75	0.067	0.0025 U	0.24	0.00022
Fluoranthene	707	0.0055	3.2	0.0046	7.6	1169	1.7	0.034	3.4	0.0048
Fluorene	538	0.0015 U	0.85	0.0016	0.084	13	0.024	0.0025 U	0.24	0.00045
Indeno(1,2,3-c,d)pyrene	1,115	0.0029	1.7	0.0015	2.8	431	0.39	0.019	1.9	0.0017
Naphthalene	385	0.0015 U	0.85	0.0022	0.0081	1.2	0.0032	0.0025 U	0.24	0.00063
Perylene	967	0.0015 U	0.85	0.00088	0.71	109	0.11	0.0025 U	0.24	0.00025
Phenanthrene	596	0.0015 U	0.85	0.0014	3.2	492	0.83	0.0092	0.91	0.0015
Pyrene	697	0.0045	2.6	0.0038	5.8	892	1.3	0.025	2.5	0.0036
Alkylated PAHs										
1-Methylnaphthalene	446	0.0015 U	0.85	0.0019	0.0058	0.89	0.0020	0.0025 U	0.24	0.00054
2-Methylnaphthalene	447	0.0015 U	0.85	0.0019	0.0060	0.92	0.0021	0.0025 U	0.24	0.00054
C1-Chrysenes	929	0.0025 U	1.5	0.0016	0.83	128	0.14	0.0057	0.56	0.00061
C1-Fluoranthenes/Pyrenes	770	0.0025 U	1.5	0.0019	1.0	154	0.20	0.0071	0.70	0.00091
C1-Fluorenes	611	0.0025 U	1.5	0.0024	0.024	3.7	0.0060	0.0025 U	0.25	0.00041
C1-Phenanthrenes/Anthracenes	670	0.0025 U	1.5	0.0022	0.85	131	0.20	0.0025 U	0.25	0.00037
C2-Chrysenes	1,008	0.0025 U	1.5	0.0015	0.25	38	0.038	0.0025 U	0.25	0.00025
C2-Fluorenes	686	0.0025 U	1.5	0.0021	0.026	4.0	0.0058	0.0025 U	0.25	0.00036
C2-Naphthalenes	510	0.0025 U	1.5	0.0029	0.017	2.6	0.0051	0.0025 U	0.25	0.00049
C2-Phenanthrenes/Anthracenes	746	0.0025 U	1.5	0.0020	0.36	55	0.074	0.0025 U	0.25	0.00033
C3-Chrysenes	1,112	0.0025 U	1.5	0.0013	0.14	22	0.019	0.0025 U	0.25	0.00022
C3-Fluorenes	769	0.0025 U	1.5	0.0019	0.050	7.7	0.010	0.0025 U	0.25	0.00032
C3-Naphthalenes	581	0.0025 U	1.5	0.0025	0.017	2.6	0.0045	0.0025 U	0.25	0.00043
C3-Phenanthrenes/Anthracenes	829	0.0025 U	1.5	0.0018	0.16	25	0.030	0.0025 U	0.25	0.00030
C4-Chrysenes	1,214	0.0025 U	1.5	0.0012	0.034	5.2	0.0043	0.0025 U	0.25	0.00020
C4-Naphthalenes	657	0.0025 U	1.5	0.0022	0.017	2.6	0.0040	0.0025 U	0.25	0.00038
C4-Phenanthrenes/Anthracenes	913	0.0025 U	1.5	0.0016	0.057	8.8	0.0096	0.0025 U	0.25	0.00027
Total Toxic Units				0.06			**8**			0.03
Effects Benchmark Exceeded?[b]				No			Yes			No

a. USEPA 2003

b. A toxic unit value exceeding 1.0 indicates the potential for toxicity to benthic invertebrates.

mg/kg - milligram per dry weight kilogram
U - not detected
µg/goc - microgram per gram organic carbon

Table 14. Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Sediment
Bway Corporation, Cincinnati, Ohio

		SWMU 22 SED07-092508			SWMU 22 SED08-092508			SWMU 22 SED09-092508		
		34 % Organic Carbon			2.4 % Organic Carbon			35 % Organic Carbon		
	Final Chronic Value[a] (µg/goc)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)
Unsubstituted PAHs										
Acenaphthene	491	0.016 U	0.046	0.000094	0.0077	0.32	0.00065	0.044	0.13	0.00026
Acenaphthylene	452	0.016 U	0.046	0.00010	0.0022 U	0.088	0.00020	0.014 U	0.040	0.000089
Anthracene	594	0.11	0.33	0.00055	0.0067	0.28	0.00046	0.17	0.49	0.00082
Benz(a)anthracene	841	0.068	0.20	0.00024	0.014	0.58	0.00069	0.19	0.55	0.00065
Benzo(a)pyrene	965	0.016 U	0.046	0.000048	0.015	0.62	0.00064	0.12	0.34	0.00036
Benzo(b)fluoranthene	979	0.067	0.20	0.00020	0.022	0.91	0.00092	0.16	0.46	0.00047
Benzo(e)pyrene	967	0.094	0.28	0.00029	0.014	0.58	0.00060	0.15	0.43	0.00045
Benzo(g,h,i)perylene	1,095	0.13	0.39	0.00035	0.016	0.66	0.00060	0.21	0.60	0.00055
Benzo(k)fluoranthene	981	0.016 U	0.046	0.000047	0.0082	0.34	0.00034	0.064	0.18	0.00019
Chrysene	844	0.072	0.21	0.00025	0.024	0.99	0.0012	0.18	0.52	0.00061
Dibenzo(a,h)anthracene	1,123	0.016 U	0.046	0.000041	0.0022 U	0.088	0.000079	0.014 U	0.040	0.000036
Fluoranthene	707	0.24	0.71	0.0010	0.042	1.7	0.0024	0.71	2.0	0.0029
Fluorene	538	0.22	0.65	0.0012	0.039	1.6	0.0030	0.23	0.66	0.0012
Indeno(1,2,3-c,d)pyrene	1,115	0.048	0.14	0.00013	0.015	0.62	0.00055	0.17	0.49	0.00044
Naphthalene	385	0.061	0.18	0.00047	0.017	0.70	0.0018	0.13	0.37	0.0010
Perylene	967	0.016 U	0.046	0.000048	0.0047	0.19	0.00020	0.014 U	0.040	0.000042
Phenanthrene	596	0.66	2.0	0.0033	0.13	5.3	0.0090	0.99	2.8	0.0048
Pyrene	697	0.34	1.0	0.0014	0.041	1.7	0.0024	0.71	2.0	0.0029
Alkylated PAHs										
1-Methylnaphthalene	446	0.016 U	0.046	0.00010	0.016	0.66	0.0015	0.092	0.26	0.00059
2-Methylnaphthalene	447	0.037	0.11	0.00025	0.0091	0.37	0.00084	0.13	0.37	0.00084
C1-Chrysenes	929	0.41	1.2	0.0013	0.018	0.74	0.00080	0.57	1.6	0.0018
C1-Fluoranthenes/Pyrenes	770	0.91	2.7	0.0035	0.050	2.1	0.0027	1.9	5.5	0.0071
C1-Fluorenes	611	0.98	2.9	0.0048	0.12	4.9	0.0081	1.9	5.5	0.0089
C1-Phenanthrenes/Anthracenes	670	2.3	6.8	0.010	0.13	5.3	0.0080	3.2	9.2	0.014
C2-Chrysenes	1,008	0.63	1.9	0.0019	0.0025 U	0.10	0.00010	0.98	2.8	0.0028
C2-Fluorenes	686	3.1	9.2	0.013	0.24	9.9	0.014	5.0	14	0.021
C2-Naphthalenes	510	0.31	0.92	0.0018	0.061	2.5	0.0049	0.91	2.6	0.0051
C2-Phenanthrenes/Anthracenes	746	3.2	9.5	0.013	0.087	3.6	0.0048	5.4	16	0.021
C3-Chrysenes	1,112	1.0	3.0	0.0027	0.0025 U	0.10	0.000093	0.014 U	0.040	0.000036
C3-Fluorenes	769	5.9	18	0.023	0.22	9.1	0.012	8.1	23	0.030
C3-Naphthalenes	581	1.2	3.6	0.0061	0.094	3.9	0.0067	2.7	7.8	0.013
C3-Phenanthrenes/Anthracenes	829	3.5	10	0.013	0.097	4.0	0.0048	6.7	19.3	0.023
C4-Chrysenes	1,214	0.016 U	0.046	0.000038	0.0025 U	0.10	0.000085	0.014 U	0.040	0.000033
C4-Naphthalenes	657	1.2	3.6	0.0054	0.066	2.7	0.0041	3.2	9.2	0.014
C4-Phenanthrenes/Anthracenes	913	3.2	9.5	0.010	0.088	3.6	0.0040	6.0	17.2	0.019
Total Toxic Units				0.1			0.1			0.2
Effects Benchmark Exceeded?[b]				No			No			No

a. USEPA 2003

b. A toxic unit value exceeding 1.0 indicates the potential for toxicity to benthic invertebrates.

mg/kg - milligram per dry weight kilogram
U - not detected
µg/goc - microgram per gram organic carbon

Table 14. Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Sediment
Bway Corporation, Cincinnati, Ohio

		AOI C SED10-092608			AOI C SED11-092608 reanalysis			AOI C SED12-092608		
		4.04 % Organic Carbon			19 % Organic Carbon			15 % Organic Carbon		
	Final Chronic Value[a] (µg/goc)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)
Unsubstituted PAHs										
Acenaphthene	491	0.0028 U	0.069	0.00014	0.0065 U	0.034	0.000069	0.0055 U	0.037	0.000075
Acenaphthylene	452	0.0028 U	0.069	0.00015	0.0065 U	0.034	0.000075	0.0055 U	0.037	0.000082
Anthracene	594	0.0028 U	0.069	0.00012	0.044	0.23	0.00039	0.014	0.094	0.00016
Benz(a)anthracene	841	0.039	0.97	0.0011	0.18	0.94	0.0011	0.10	0.67	0.00080
Benzo(a)pyrene	965	0.050	1.2	0.0013	0.25	1.3	0.0014	0.13	0.87	0.00090
Benzo(b)fluoranthene	979	0.068	1.7	0.0017	0.34	1.8	0.0018	0.18	1.2	0.0012
Benzo(e)pyrene	967	0.040	0.99	0.0010	0.18	0.94	0.0010	0.098	0.66	0.00068
Benzo(g,h,i)perylene	1,095	0.050	1.2	0.0011	0.19	0.99	0.00091	0.12	0.81	0.00074
Benzo(k)fluoranthene	981	0.023	0.57	0.00058	0.13	0.68	0.00069	0.068	0.46	0.00047
Chrysene	844	0.052	1.3	0.0015	0.25	1.3	0.0016	0.14	0.94	0.0011
Dibenzo(a,h)anthracene	1,123	0.012	0.30	0.00026	0.035	0.18	0.00016	0.023	0.15	0.00014
Fluoranthene	707	0.092	2.3	0.0032	0.48	2.5	0.0036	0.28	1.9	0.0027
Fluorene	538	0.0028 U	0.069	0.00013	0.0065 U	0.034	0.000063	0.0055 U	0.037	0.000069
Indeno(1,2,3-c,d)pyrene	1,115	0.060	1.5	0.0013	0.19	0.99	0.00089	0.13	0.87	0.00078
Naphthalene	385	0.0028 U	0.069	0.00018	0.020	0.10	0.00027	0.013	0.087	0.00023
Perylene	967	0.014	0.35	0.00036	0.056	0.29	0.00030	0.033	0.22	0.00023
Phenanthrene	596	0.034	0.84	0.0014	0.16	0.84	0.0014	0.11	0.74	0.0012
Pyrene	697	0.062	1.5	0.0022	0.38	2.0	0.0029	0.22	1.5	0.0021
Alkylated PAHs										
1-Methylnaphthalene	446	0.0028 U	0.069	0.00016	0.015	0.079	0.00018	0.014	0.094	0.00021
2-Methylnaphthalene	447	0.0028 U	0.069	0.00016	0.015	0.079	0.00018	0.014	0.094	0.00021
C1-Chrysenes	929	0.030	0.74	0.00080	0.10	0.52	0.00056	0.058	0.39	0.00042
C1-Fluoranthenes/Pyrenes	770	0.032	0.79	0.0010	0.14	0.73	0.0010	0.090	0.60	0.00078
C1-Fluorenes	611	0.0028 U	0.069	0.00011	0.0065 U	0.034	0.000056	0.0055 U	0.037	0.000060
C1-Phenanthrenes/Anthracenes	670	0.015	0.37	0.00055	0.073	0.38	0.00057	0.055	0.37	0.00055
C2-Chrysenes	1,008	0.0028 U	0.069	0.000069	0.038	0.20	0.00020	0.027	0.18	0.00018
C2-Fluorenes	686	0.0028 U	0.069	0.00010	0.0065 U	0.034	0.000050	0.0055 U	0.037	0.000054
C2-Naphthalenes	510	0.0028 U	0.069	0.00014	0.027	0.14	0.00028	0.023	0.15	0.00030
C2-Phenanthrenes/Anthracenes	746	0.018	0.45	0.00060	0.060	0.31	0.00042	0.049	0.33	0.00044
C3-Chrysenes	1,112	0.0028 U	0.069	0.000062	0.023	0.12	0.00011	0.0055 U	0.037	0.000033
C3-Fluorenes	769	0.0028 U	0.069	0.000090	0.0065 U	0.034	0.000044	0.0055 U	0.037	0.000048
C3-Naphthalenes	581	0.0028 U	0.069	0.00012	0.016	0.084	0.00014	0.013	0.087	0.00015
C3-Phenanthrenes/Anthracenes	829	0.0028 U	0.069	0.000084	0.028	0.15	0.00018	0.022	0.15	0.00018
C4-Chrysenes	1,214	0.0028 U	0.069	0.000057	0.0065 U	0.034	0.000028	0.0055 U	0.037	0.000030
C4-Naphthalenes	657	0.0028 U	0.069	0.00011	0.0065 U	0.034	0.000052	0.0055 U	0.037	0.000056
C4-Phenanthrenes/Anthracenes	913	0.0028 U	0.069	0.000076	0.0065 U	0.034	0.000037	0.0055 U	0.037	0.000040
Total Toxic Units				0.02			0.02			0.02
Effects Benchmark Exceeded?[b]				No			No			No

a. USEPA 2003

b. A toxic unit value exceeding 1.0 indicates the potential for toxicity to benthic invertebrates.

mg/kg - milligram per dry weight kilogram
U - not detected
µg/goc - microgram per gram organic carbon

Table 14. Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Sediment
Bway Corporation, Cincinnati, Ohio

		AOI C SED13-092608			AOI C DUP02-092608			AOI C SED14-092608		
		2.9 % Organic Carbon			2.5 % Organic Carbon			20 % Organic Carbon		
	Final Chronic Value[a] (µg/goc)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)	PAH Concentration (mg/kg)	PAH Concentration (µg/goc)	Toxic Unit (unitless)
Unsubstituted PAHs										
Acenaphthene	491	0.0033 U	0.11	0.00023	0.0029 U	0.11	0.00023	0.0047 U	0.023	0.000047
Acenaphthylene	452	0.0033 U	0.11	0.00025	0.0029 U	0.11	0.00025	0.012	0.059	0.00013
Anthracene	594	0.0033 U	0.11	0.00019	0.0029 U	0.11	0.00019	0.017	0.083	0.00014
Benz(a)anthracene	841	0.015	0.52	0.00062	0.010	0.40	0.00048	0.16	0.78	0.00093
Benzo(a)pyrene	965	0.022	0.77	0.00080	0.012	0.48	0.00050	0.20	0.98	0.0010
Benzo(b)fluoranthene	979	0.035	1.2	0.0013	0.019	0.76	0.00078	0.27	1.3	0.0014
Benzo(e)pyrene	967	0.020	0.70	0.00072	0.011	0.44	0.00046	0.15	0.74	0.00076
Benzo(g,h,i)perylene	1,095	0.017	0.59	0.00054	0.011	0.44	0.00040	0.17	0.83	0.00076
Benzo(k)fluoranthene	981	0.014	0.49	0.00050	0.0067	0.27	0.00027	0.098	0.48	0.00049
Chrysene	844	0.022	0.77	0.00091	0.016	0.64	0.00076	0.22	1.1	0.0013
Dibenzo(a,h)anthracene	1,123	0.0033 U	0.11	0.00010	0.0029 U	0.11	0.00010	0.034	0.17	0.00015
Fluoranthene	707	0.029	1.0	0.0014	0.027	1.08	0.0015	0.42	2.1	0.0029
Fluorene	538	0.0033 U	0.11	0.00021	0.0029 U	0.11	0.00021	0.018	0.088	0.00016
Indeno(1,2,3-c,d)pyrene	1,115	0.020	0.70	0.00063	0.012	0.48	0.00043	0.19	0.93	0.00084
Naphthalene	385	0.0033 U	0.11	0.00030	0.0029 U	0.11	0.00030	0.029	0.14	0.00037
Perylene	967	0.0033 U	0.11	0.00012	0.0029 U	0.11	0.00012	0.045	0.22	0.00023
Phenanthrene	596	0.012	0.42	0.00070	0.012	0.48	0.00081	0.23	1.1	0.0019
Pyrene	697	0.025	0.87	0.0013	0.023	0.92	0.0013	0.30	1.5	0.0021
Alkylated PAHs										
1-Methylnaphthalene	446	0.0033 U	0.11	0.00025	0.0029 U	0.11	0.00026	0.047	0.23	0.00052
2-Methylnaphthalene	447	0.0033 U	0.11	0.00025	0.0029 U	0.11	0.00026	0.041	0.20	0.00045
C1-Chrysenes	929	0.014	0.49	0.00053	0.0065	0.26	0.00028	0.13	0.64	0.00069
C1-Fluoranthenes/Pyrenes	770	0.012	0.42	0.00054	0.0091	0.37	0.00047	0.19	0.93	0.0012
C1-Fluorenes	611	0.0033 U	0.11	0.00019	0.0029 U	0.11	0.00019	0.031	0.15	0.00025
C1-Phenanthrenes/Anthracenes	670	0.0033 U	0.11	0.00017	0.0029 U	0.11	0.00017	0.15	0.74	0.0011
C2-Chrysenes	1,008	0.0081	0.28	0.00028	0.0029 U	0.11	0.00011	0.090	0.44	0.00044
C2-Fluorenes	686	0.0033 U	0.11	0.00017	0.0029 U	0.11	0.00017	0.033	0.16	0.00024
C2-Naphthalenes	510	0.0033 U	0.11	0.00022	0.0029 U	0.11	0.00022	0.10	0.49	0.00096
C2-Phenanthrenes/Anthracenes	746	0.0033 U	0.11	0.00015	0.0029 U	0.11	0.00015	0.12	0.59	0.00079
C3-Chrysenes	1,112	0.0033 U	0.11	0.00010	0.0029 U	0.11	0.00010	0.071	0.35	0.00031
C3-Fluorenes	769	0.0033 U	0.11	0.00015	0.0029 U	0.11	0.00015	0.035	0.17	0.00022
C3-Naphthalenes	581	0.0033 U	0.11	0.00020	0.0029 U	0.11	0.00020	0.10	0.49	0.00084
C3-Phenanthrenes/Anthracenes	829	0.0033 U	0.11	0.00014	0.0029 U	0.11	0.00014	0.086	0.42	0.00051
C4-Chrysenes	1,214	0.0033 U	0.11	0.000094	0.0029 U	0.11	0.000094	0.0047 U	0.023	0.000019
C4-Naphthalenes	657	0.0033 U	0.11	0.00017	0.0029 U	0.11	0.00017	0.038	0.19	0.00028
C4-Phenanthrenes/Anthracenes	913	0.0033 U	0.11	0.00012	0.0029 U	0.11	0.00013	0.044	0.22	0.00024
Total Toxic Units				0.01			0.01			0.02
Effects Benchmark Exceeded?[b]				No			No			No

a. USEPA 2003

b. A toxic unit value exceeding 1.0 indicates the potential for toxicity to benthic invertebrates.

mg/kg - milligram per dry weight kilogram
U - not detected
µg/goc - microgram per gram organic carbon

Table 14. Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Sediment
Bway Corporation, Cincinnati, Ohio

		AOI C SED15-092608			
		22 % Organic Carbon			
	Final Chronic Value[a] (µg/goc)	PAH Concentration (mg/kg)		PAH Concentration (µg/goc)	Toxic Unit (unitless)
Unsubstituted PAHs					
Acenaphthene	491	0.0060	U	0.027	0.000055
Acenaphthylene	452	0.0060	U	0.027	0.000060
Anthracene	594	0.0060	U	0.027	0.000046
Benz(a)anthracene	841	0.061		0.28	0.00033
Benzo(a)pyrene	965	0.076		0.34	0.00036
Benzo(b)fluoranthene	979	0.11		0.50	0.00051
Benzo(e)pyrene	967	0.062		0.28	0.00029
Benzo(g,h,i)perylene	1,095	0.067		0.30	0.00028
Benzo(k)fluoranthene	981	0.037		0.17	0.00017
Chrysene	844	0.080		0.36	0.00043
Dibenzo(a,h)anthracene	1,123	0.015		0.068	0.000060
Fluoranthene	707	0.14		0.63	0.00090
Fluorene	538	0.0060	U	0.027	0.000050
Indeno(1,2,3-c,d)pyrene	1,115	0.072		0.33	0.00029
Naphthalene	385	0.0060	U	0.027	0.000071
Perylene	967	0.019		0.086	0.000089
Phenanthrene	596	0.066		0.30	0.00050
Pyrene	697	0.11		0.50	0.00071
Alkylated PAHs					
1-Methylnaphthalene	446	0.0060	U	0.027	0.000061
2-Methylnaphthalene	447	0.0060	U	0.027	0.000061
C1-Chrysenes	929	0.034		0.15	0.00017
C1-Fluoranthenes/Pyrenes	770	0.056		0.25	0.00033
C1-Fluorenes	611	0.0060	U	0.027	0.000044
C1-Phenanthrenes/Anthracenes	670	0.034		0.15	0.00023
C2-Chrysenes	1,008	0.024		0.11	0.00011
C2-Fluorenes	686	0.0060	U	0.027	0.000040
C2-Naphthalenes	510	0.016		0.072	0.00014
C2-Phenanthrenes/Anthracenes	746	0.034		0.15	0.00021
C3-Chrysenes	1,112	0.0060	U	0.027	0.000024
C3-Fluorenes	769	0.0060	U	0.027	0.000035
C3-Naphthalenes	581	0.0060	U	0.027	0.000047
C3-Phenanthrenes/Anthracenes	829	0.018		0.081	0.000098
C4-Chrysenes	1,214	0.0060	U	0.027	0.000022
C4-Naphthalenes	657	0.0060	U	0.027	0.000041
C4-Phenanthrenes/Anthracenes	913	0.0060	U	0.027	0.000030
Total Toxic Units					0.01
Effects Benchmark Exceeded?[b]					No

a. USEPA 2003

b. A toxic unit value exceeding 1.0 indicates the potential for toxicity to benthic invertebrates.

mg/kg - milligram per dry weight kilogram
U - not detected
µg/goc - microgram per gram organic carbon

Table 15. Evaluation of Simultaneously Extracted Metals (SEM) and Acid Volatile Sulfide (AVS) in Sediment
Bway Corporation, Cincinnati, Ohio

Location	TOC (%)	Cadmium (µmol/g)	Copper (µmol/g)	Lead (µmol/g)	Nickel (µmol/g)	Silver (µmol/g)	Zinc (µmol/g)	AVS (µmol/g)	Organic Normalized Excess SEM[a] (µmol/goc)	Cumulative Effects Benchmark Exceeded?[b]	Sequential Analysis Effects Benchmark Exceeded?[c]
SED05	0.65	0.0018	0.028	0.013	0.019	0.00046	6.9	2.3	715	Yes	No
SED07	34	0.010	6.5	0.11	0.86	0.081	14	122	-299	No	---
SED08	2.4	0.0012	0.96	0.034	0.21	0.0023	2.3	51	-1974	No	---
SED09	35	0.0085	14	0.27	1.3	0.12	30	169	-354	No	---
SED11	19	0.0068	0.42	0.27	0.17	0.0065	1.7	16	-72	No	---
SED14	20	0.0066	0.32	0.22	0.11	0.0028	1.1	0.030	8.3	No	---
SED15	22	0.011	0.61	0.28	0.20	0.0042	0.39	0.98	2.3	No	---

a. {∑SEM-AVS}/foc
b. Toxicity to benthic invertebrates is very unlikely at concentrations below 130 µmol/goc and very likely at concentrations above 3,000 µmol/goc (USEPA 2005).
c. Toxicity to benthic invertebrates is unlikely at concentrations below 1,400 µmol/goc (zinc) (Di Toro et al. 2005).

foc: fraction organic carbon {TOC(%)/100}
TOC: total organic carbon
µmol/g: micromoles per gram
µmol/goc: micromoles per gram organic carbon

TABLE 16. Evaluation of Polycyclic Aromatic Hydrocarbons (PAHs) in Surface Water
Bway Corporation, Cincinnati, OH

		SW03-092308		SW05-092408		SW06-092408	
	Final Chronic Value[a] (µg/L)	PAH Concentration (µg/L)	Toxic Unit (unitless)	PAH Concentration (µg/L)	Toxic Unit (unitless)	PAH Concentration (µg/L)	Toxic Unit (unitless)
Unsubstituted PAHs							
Acenaphthene	56	0.010 U	0.00018	0.010 U	0.00017	0.010 U	0.00017
Acenaphthylene	307	0.010 U	0.000033	0.010 U	0.000031	0.010 U	0.000031
Anthracene	21	0.010 U	0.00048	0.010 U	0.00046	0.010 U	0.00046
Benz(a)anthracene	2	0.010 U	0.0045	0.010 U	0.0043	0.010 U	0.0043
Benzo(a)pyrene	1	0.010 U	0.010	0.010 U	0.010	0.010 U	0.010
Benzo(b)fluoranthene	1	0.010 U	0.015	0.029	0.043	0.010 U	0.014
Benzo(e)pyrene	1	0.010 U	0.011	0.019	0.021	0.010 U	0.011
Benzo(g,h,i)perylene	0	0.010 U	0.023	0.010 U	0.022	0.010 U	0.022
Benzo(k)fluoranthene	1	0.010 U	0.016	0.010 U	0.015	0.010 U	0.015
Chrysene	2	0.010 U	0.0050	0.029	0.015	0.010 U	0.0048
Dibenzo(a,h)anthracene	0	0.010 U	0.036	0.010 U	0.034	0.010 U	0.034
Fluoranthene	7	0.029	0.0041	0.053	0.0075	0.022	0.0031
Fluorene	39	0.010 U	0.00025	0.010 U	0.00024	0.010 U	0.00024
Indeno(1,2,3-c,d)pyrene	0	0.010 U	0.036	0.021	0.075	0.010 U	0.034
Naphthalene	193	0.010 U	0.000052	0.010 U	0.000049	0.010 U	0.000049
Perylene	1	0.010 U	0.011	0.010 U	0.011	0.010 U	0.011
Phenanthrene	19	0.010 U	0.00052	0.010 U	0.00050	0.010 U	0.00050
Pyrene	10	0.021	0.0021	0.041	0.0041	0.010 U	0.00094
Alkylated PAHs							
1-Methylnaphthalene	75	0.010 U	0.00013	0.010 U	0.00013	0.010 U	0.00013
2-Methylnaphthalene	72	0.010 U	0.00014	0.010 U	0.00013	0.010 U	0.00013
C1-Chrysenes	1	0.010 U	0.012	0.010 U	0.012	0.010 U	0.012
C1-Fluoranthenes/Pyrenes	3	0.010 U	0.0031	0.010 U	0.0031	0.010 U	0.0031
C1-Fluorenes	14	0.010 U	0.00071	0.010 U	0.00071	0.010 U	0.00071
C1-Phenanthrenes/Anthracenes	7	0.010 U	0.0014	0.010 U	0.0014	0.010 U	0.0014
C2-Chrysenes	0	0.010 U	0.021	0.010 U	0.021	0.010 U	0.021
C2-Fluorenes	5	0.010 U	0.0019	0.010 U	0.0019	0.010 U	0.0019
C2-Naphthalenes	30	0.010 U	0.00033	0.010 U	0.00033	0.010 U	0.00033
C2-Phenanthrenes/Anthracenes	3	0.010 U	0.0031	0.010 U	0.0031	0.010 U	0.0031
C3-Chrysenes	0	0.010 U	0.059	0.010 U	0.059	0.010 U	0.059
C3-Fluorenes	2	0.010 U	0.0053	0.010 U	0.0053	0.010 U	0.0053
C3-Naphthalenes	11	0.010 U	0.00090	0.010 U	0.00090	0.010 U	0.00090
C3-Phenanthrenes/Anthracenes	1	0.010 U	0.0077	0.010 U	0.0077	0.010 U	0.0077
C4-Chrysenes	0	0.010 U	0.14	0.010 U	0.14	0.010 U	0.14
C4-Naphthalenes	4	0.010 U	0.0025	0.010 U	0.0025	0.010 U	0.0025
C4-Phenanthrenes/Anthracenes	1	0.010 U	0.018	0.010 U	0.018	0.010 U	0.018
Total Toxic Units			**0.5**		**0.5**		**0.4**
Effects Benchmark Exceeded?[b]			**No**		**No**		**No**

a. USEPA 2003

b. A toxic unit value exceeding 1.0 indicates the potential for toxicity to invertebrates and fish.

µg/L - microgram per liter

U - not detected

Table 17. Effects of Uncertainty in Ecological Risk Assessment
Bway Corporation, Cincinnati, OH

Assumptions	Description And Discussion Related To Uncertainties in Ecological Risk Assessment (ERA)	Uncertainty in SLERA	Uncertainty in BERA
Analytical Sampling and Data Analysis			
Limited number of samples – biased sampling	Frequently, there are only a limited number of samples used in ERAs, and very often they are collected in a biased manner (i.e., targeting "hot spots"). This type of sampling often lacks statistical power and does not likely represent the concentrations in the environment in which wildlife exposure occurs. Similarly, limited data used to estimate uptake into organisms may overestimate exposure via the food web.	Overestimate of exposure and risk	Overestimate of exposure and risk
Detection limits	Detection limits may exceed screening values, or thresholds for adverse impacts are well below the analytical methods used in ERA (e.g., compounds that are known or suspected to cause endocrine effects).	May underestimate risk or effect on risk estimate unknown	May underestimate risk or effect on risk estimate unknown
Degradation of chemicals not considered	ERAs are almost exclusively based on concentrations of target compounds, and little if any attention is given to degradation compounds that could be more toxic than the original chemical. Conversely, toxic chemical concentrations may decrease over time due to natural physical processes.	Effect on risk estimate unknown	Effect on risk estimate unknown
Selection of Constituents of Potential Concern (COPCs)			
Background concentrations	Chemicals may be identified as preliminary COPECs despite the fact that the detected concentrations are less than background concentrations. This occurs because the ERA Process does not permit use of background until Step 3a of the BERA (USEPA, 2000a; 2001).	Overestimate of risk	Not Applicable
Toxicology and Ecotoxicity Screening Values (ESVs)			
Toxicity data for a limited number of species	Uncertainties exist in many aspects of the toxicology relied upon for conducting ERAs (Newman 1998; Lovett Doust et al 1993). Toxicity data are only available for a limited number of species (most of them laboratory test species) under a strictly defined set of test conditions that deviate from natural conditions (Sample et al., 1996; Suter 1996).	Effect on risk estimate unknown	Effect on risk estimate unknown

Table 17. Effects of Uncertainty in Ecological Risk Assessment
Bway Corporation, Cincinnati, OH

Assumptions	Description And Discussion Related To Uncertainties in Ecological Risk Assessment (ERA)	Uncertainty in SLERA	Uncertainty in BERA
Laboratory testing	In current practice, more than 95 percent of the resources in toxicology are focused toward the study of single chemicals (Cassee et al 1998), while wildlife exposures rarely occur on a chemical-specific basis. Simplistic extrapolations from laboratory species to wildlife species and testing conditions to field conditions are not likely accurate, and are rarely, if ever, validated against natural conditions (Power 1996; Tannenbaum 2003).	Effect on risk estimate unknown	Effect on risk estimate unknown
Adaptation and tolerance	There is little consistency and no quantitative methodology for the consideration of diminished bioavailability (and, thereby, diminished toxicity) even though this process is well documented (e.g., Alexander and Alexander 1999; Alexander 2000). Similarly, tolerance and adaptation are not considered directly (Millward and Klerks 2002; Grant 2002). Furthermore, the white rat used for testing is bred to minimize differences between lab animals, diminishing the genetic variability that give wildlife some capability for adaptation and tolerance (Tannenbaum 2003).	Overestimate of risk	Overestimate of risk
Predator-prey interactions	Finally, there are relatively few studies that actually evaluate the effects of toxicity on predator-prey interactions, or on competition for scarce resources (Atchison et al 1996), the very conditions within which all wildlife exists (Kapustka and Landis 1998).	Effect on risk estimate unknown	Effect on risk estimate unknown
Hazard Quotients (HQs)			
HQs based on maximum concentrations	The SLERA HQ is based on the maximum detected concentrations and the most conservative ecotoxicity screening value available (USEPA 1997a; 2000a). HQs in the BERA may also be based on maximum concentrations, particularly when the UCL exceeds the maximum concentration.	Overestimate of risk	Overestimate of risk
Elevated HQs for background concentrations	HQs may exceed a value of 1 for background concentrations of naturally occurring metals (Tannenbaum 2003). This is due to many of the toxicology and ESV uncertainties already discussed.	Overestimate of risk	Overestimate of risk
Interpretation of HQs	An HQ less than or equal to a value of 1 indicates that adverse impacts to wildlife are considered unlikely (USEPA 2000a). However, there is no clear guidance for interpreting the HQs that exceed a value of 1, except that this point of departure indicates that adverse effects of some kind may have occurred or may occur in the future.	Effect on risk estimate unknown	Effect on risk estimate unknown

Table 17. Effects of Uncertainty in Ecological Risk Assessment
Bway Corporation, Cincinnati, OH

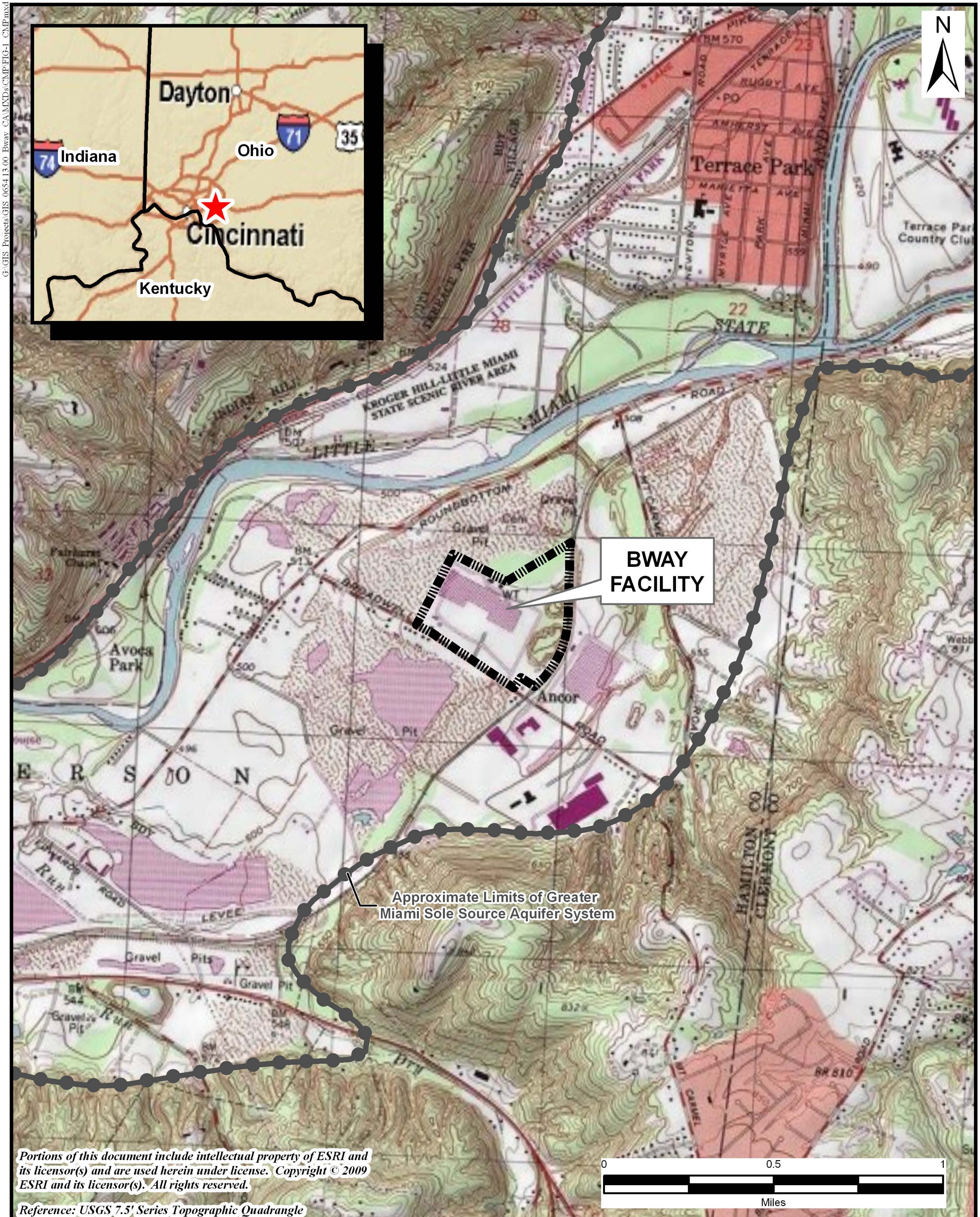
Assumptions	Description And Discussion Related To Uncertainties in Ecological Risk Assessment (ERA)	Uncertainty in SLERA	Uncertainty in BERA
HQs for individual used to evaluate risks to populations	HQs are based on the types of impacts that could occur to individuals (i.e., those individuals exposed to maximum concentrations), and they completely fail to address ecological exposure and risk at spatial scale of populations (Tannenbaum 2003; Durda and Preziosi 1999).	Overestimate of risk to wildlife populations	Overestimate of risk to wildlife populations
HQs with unrealistic magnitudes	HQs are seen at magnitudes that suggest that every animal should die upon acute exposure (i.e., in the hundreds or thousands). Often, physical conditions at a site demonstrate that this is not the case.	Overestimate of risk	Overestimate of risk
Food Web Modeling			
Food web modeling exposure parameter assumptions	Some exposure parameters are obtained from the literature, and some are based on default assumptions (e.g., Sample et al 1996). Efforts are made to select exposure parameters representative of a variety of species or feeding guilds, so that exposure estimates would be representative of more than a single species. Although there is sometimes verification of some assumptions (e.g., body weight and concentrations of chemicals in dietary parameters), other assumptions are rarely, if ever, field verified (e.g., ingestion rates).	Not Applicable	Effect on risk estimate unknown
Assuming 100% bioavailability	Bioaccumulation and ingestion intake models that assume 100% bioavailability. There is little consistency and no quantitative methodology for the consideration of the diminished bioavailability (and, thereby, diminished toxicity) even though this process is well documented (e.g., Alexander and Alexander 1999; Alexander 2000). Similarly, tolerance and adaptation are not considered directly (Millward and Klerks 2002; Grant 2002).	Not Applicable	Results in an overestimate of risk
Receptors will spend equal time in habitats within home range	Organisms will spend varying amounts of time in different habitats, which could affect their exposures. Assuming that receptors spend 100% of their time in a contaminated area may be unrealistic (e.g., when the spatial scale of a release area is very small compared to a home range).	Not Applicable	Results in an overestimate of risk
Extrapolation between species Extrapolation	Species differ with respect to absorption, metabolism, distribution, and excretion of chemicals. The magnitude and direction of the difference will vary with each chemical (Sample et al 1996).	Not Applicable	Effect on risk estimate unknown

Table 17. Effects of Uncertainty in Ecological Risk Assessment
Bway Corporation, Cincinnati, OH

Assumptions	Description And Discussion Related To Uncertainties in Ecological Risk Assessment (ERA)	Uncertainty in SLERA	Uncertainty in BERA
Evaluation of PAHs	A frequent assumption is the use of toxicity benchmarks for PAHs that have carcinogenicity as the measured endpoint. It is unlikely that cancer or tumor growth are significant ecological endpoints.	Not Applicable	Effect on risk estimate unknown
Body weight scaling	Body weight scaling factors (Sample et al 1996) are commonly used to extrapolate toxicity reference values (TRVs) between test organisms and representative wildlife receptors. This approach assumes that an organism's capacity to metabolize contaminants is inversely related to body size. These assumptions are based on literature values, and it is not likely that these assumptions have been field verified.	Not Applicable	Not Applicable to FTL-65 because this approach was not used for birds
No evaluation of dermal or inhalation pathways	The dermal and inhalation exposure pathways are generally considered “insignificant” due to protective fur and feathers. Under certain conditions, these exposure pathways may occur.	Not Applicable	Potentially an underestimate of risk

BERA	Baseline Ecological Risk Assessment
COPCs	Constituents of Potential Concern
COPECs	Constituents of Potential Ecological Concern
ERA	Ecological Risk Assessment
ESOI	Envirosafe Services of Ohio, Inc.
ESV	Ecotoxicity Screening Values
HQs	Hazard Quotients
PAH	Polycyclic Aromatic Hydrocarbons
SLERA	Screening Level Ecological Risk Assessment
TRVs	Toxicity Reference Values
UCL	Upper Confidence Limit
USEPA	United States Environmental Protection Agency

FIGURES



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DRAWN BY	PROJECT NO.	DATE	TITLE
JAG	0654.13.09	Tuesday, September 29, 2009	**SITE VICINITY MAP**
CLIENT: BWAY - RCRA Corrective Action			

The Payne Firm, Inc. http://www.paynefirm.com/
Economic & Environmental Strategies for Business
Cincinnati / Cleveland / Chicago / New York / London, UK

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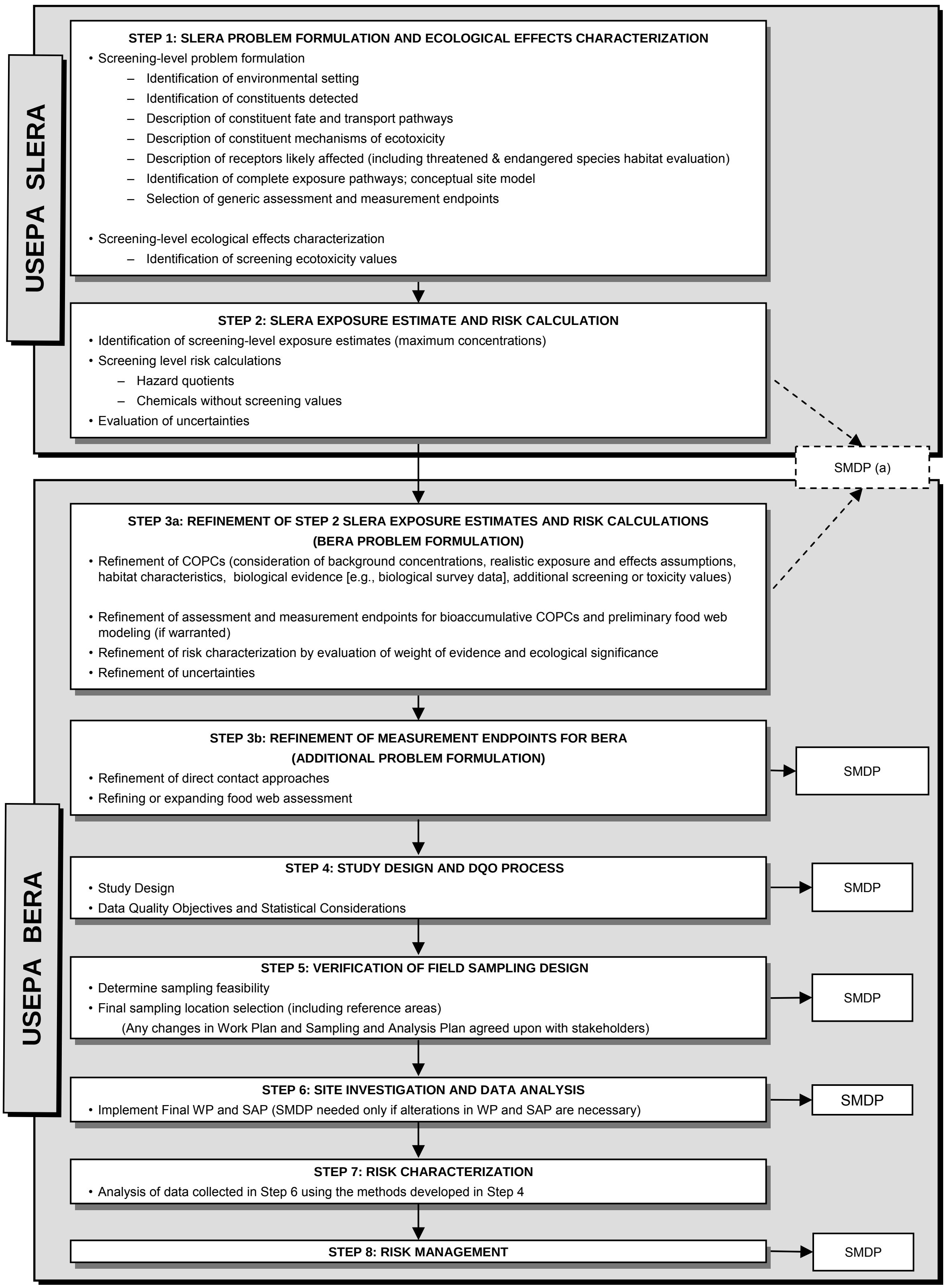
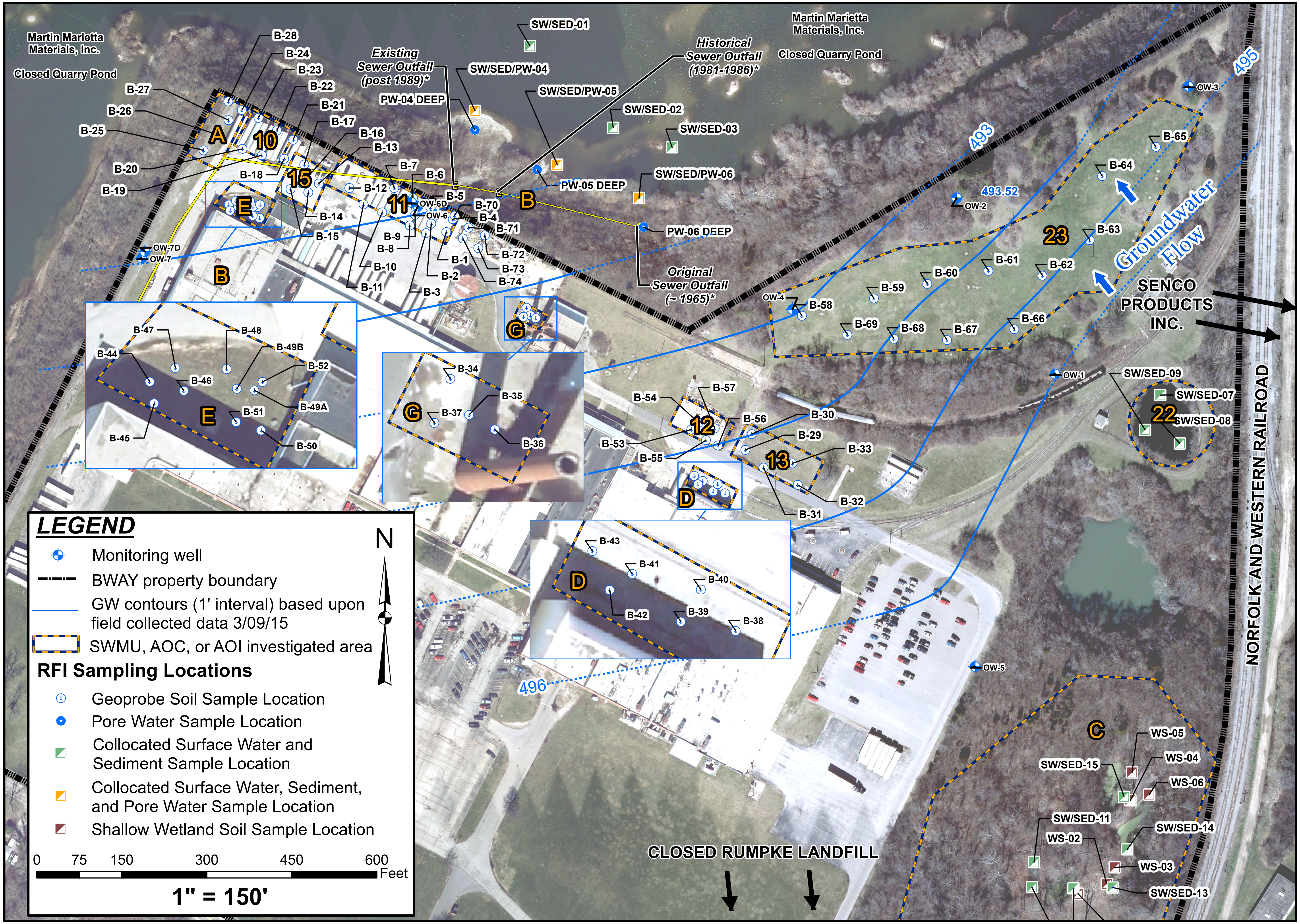
FIGURE **1**

Figure 2. USEPA Expanded Eight-Step Ecological Risk Assessment Process



Notes:

(a)	SMDP occurs EITHER after Step 2 or after Step 3a
COPCs	Constituents of Potential Concern
DQO	Data Quality Objectives
GW	Groundwater
SAP	Sampling and Analysis Plan
SW/SD	Surface water and sediment
WP	Work Plan
Sources:	USEPA Process Adapted from USEPA, 1997, 2000, 2001
SMDP	Scientific Management Decision Point [Note that SMDPs do not identify formal reporting requirements, but identify when stakeholder communication should be considered]
BERA	Baseline ERA
SLERA	Screening-level ERA
USEPA	United States Environmental Protection Agency
USEPA,	1997. Ecological Risk Assessment Guidance for Superfund.
USEPA,	2000. Amended Guidance on Ecological Risk Assessment at Military Bases: Process Considerations, Timing of Activities, and Inclusion of Stakeholders .
USEPA,	2001. ECO-Update: Role of Screening-level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments.



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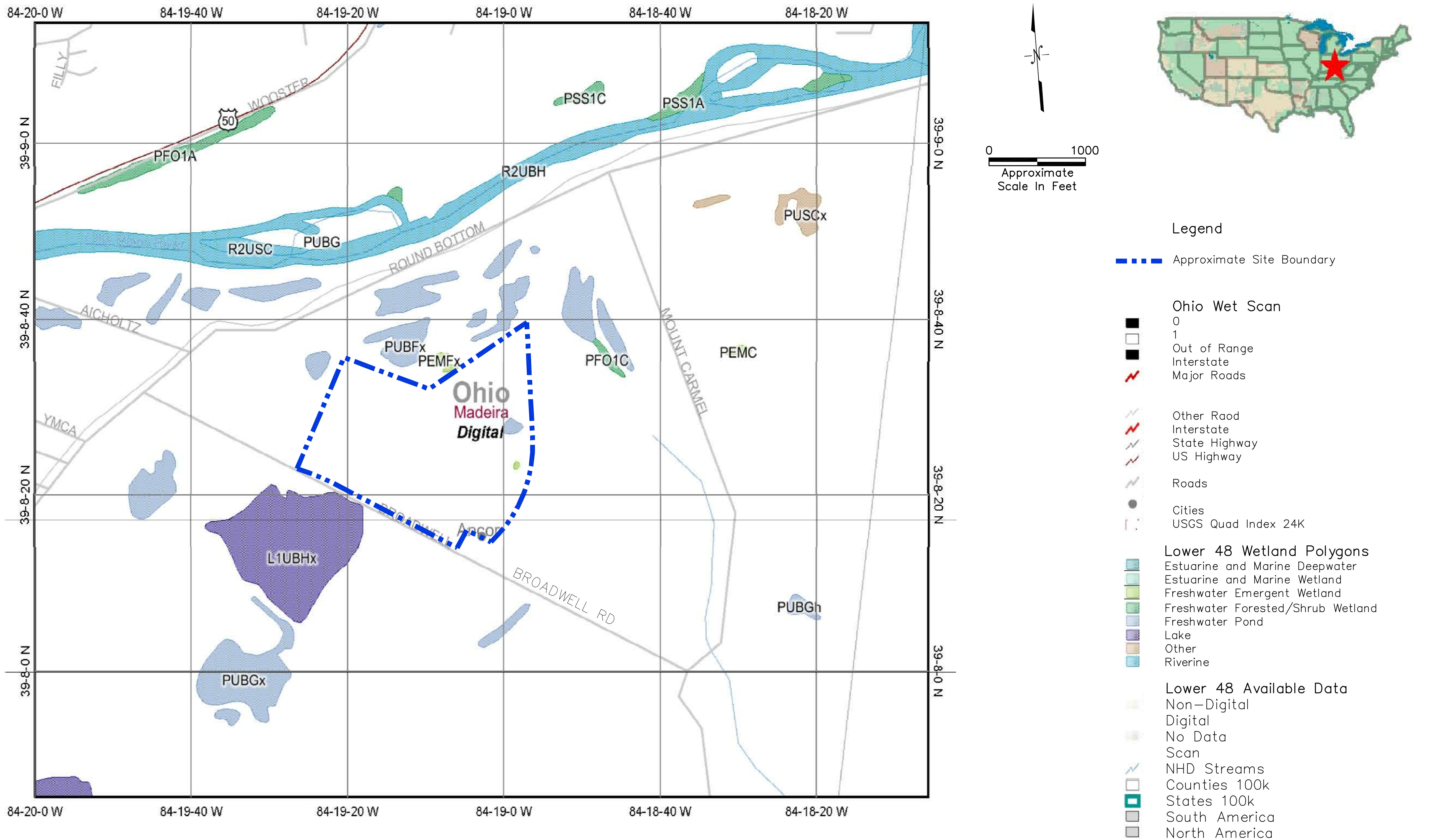
TRC Environmental Corporation

FIGURE NO.	3	DATE	12/17/2008
DRAWN BY	JAG	REQUESTED BY	KDK
PROJECT NO.	654.13.07		

PROJECT *BWAY - RCRA Corrective Action*

TITLE *RFI Sampling Locations and Groundwater Contours*

REFERENCE *Data Copyright © 2008, The Payne Firm, Inc. Additional public information data Copyright © 2006 Orthophoto Courtesy CAGIS (http://cagis.hamilton-co.org/). This map does not represent a legal document. It is intended to serve as an aid in graphical representation only.*



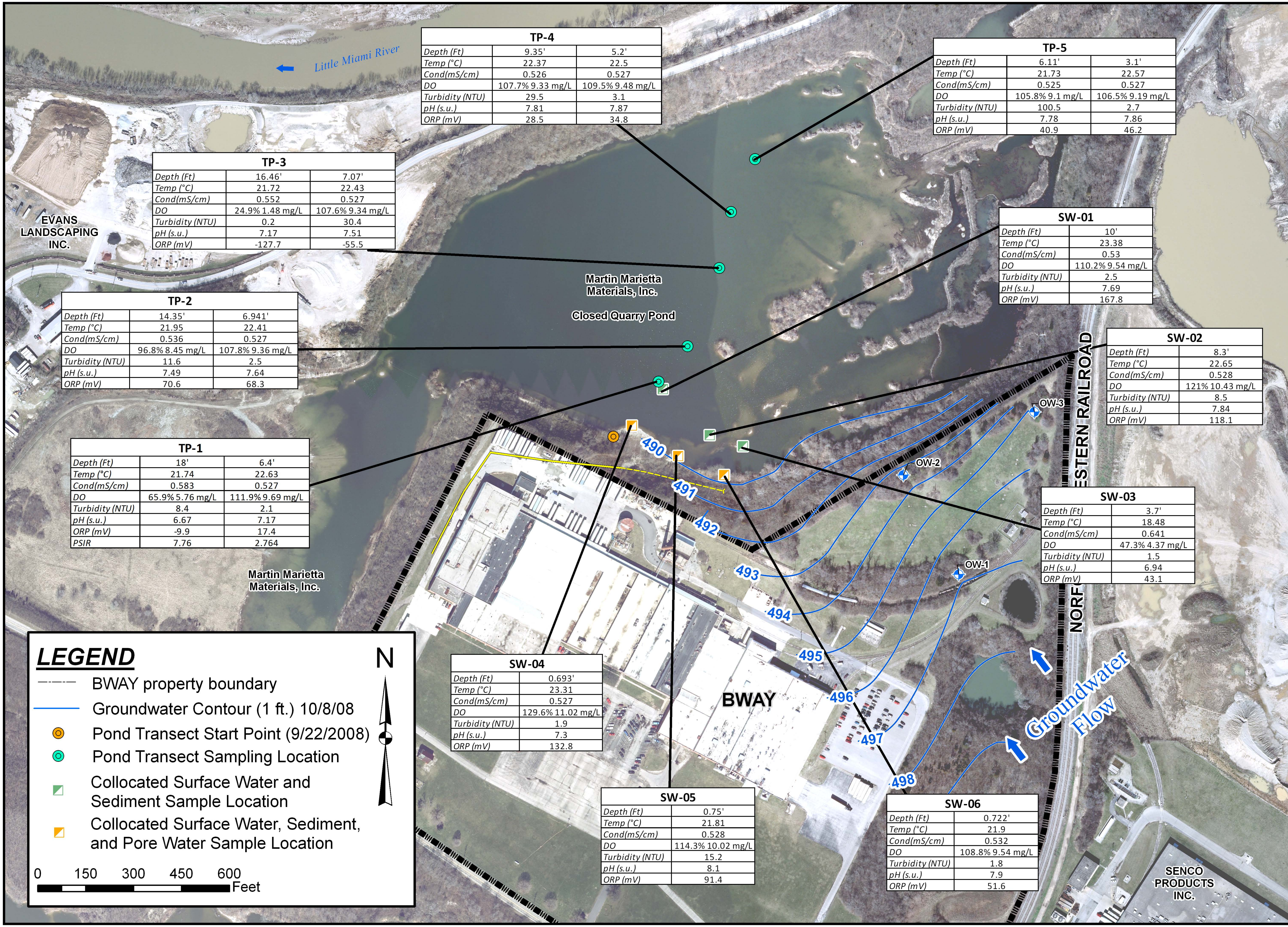
ENVIRON

DRAFTED BY: PRM/PMASCARO DATE: 8/24/09

NATIONAL WETLAND INVENTORY MAP
BWAY CORPORATION
CINCINNATI, OHIO

FIGURE
4

20860A3C3D-B01



TP-4

Depth (Ft)	9.35'	5.2'
Temp (°C)	22.37	22.5
Cond(mS/cm)	0.526	0.527
DO	107.7% 9.33 mg/L	109.5% 9.48 mg/L
Turbidity (NTU)	29.5	3.1
pH (s.u.)	7.81	7.87
ORP (mV)	28.5	34.8

TP-5

Depth (Ft)	6.11'	3.1'
Temp (°C)	21.73	22.57
Cond(mS/cm)	0.525	0.527
DO	105.8% 9.1 mg/L	106.5% 9.19 mg/L
Turbidity (NTU)	100.5	2.7
pH (s.u.)	7.78	7.86
ORP (mV)	40.9	46.2

TP-3

Depth (Ft)	16.46'	7.07'
Temp (°C)	21.72	22.43
Cond(mS/cm)	0.552	0.527
DO	24.9% 1.48 mg/L	107.6% 9.34 mg/L
Turbidity (NTU)	0.2	30.4
pH (s.u.)	7.17	7.51
ORP (mV)	-127.7	-55.5

SW-01

Depth (Ft)	10'
Temp (°C)	23.38
Cond(mS/cm)	0.53
DO	110.2% 9.54 mg/L
Turbidity (NTU)	2.5
pH (s.u.)	7.69
ORP (mV)	167.8

TP-2

Depth (Ft)	14.35'	6.941'
Temp (°C)	21.95	22.41
Cond(mS/cm)	0.536	0.527
DO	96.8% 8.45 mg/L	107.8% 9.36 mg/L
Turbidity (NTU)	11.6	2.5
pH (s.u.)	7.49	7.64
ORP (mV)	70.6	68.3

SW-02

Depth (Ft)	8.3'
Temp (°C)	22.65
Cond(mS/cm)	0.528
DO	121% 10.43 mg/L
Turbidity (NTU)	8.5
pH (s.u.)	7.84
ORP (mV)	118.1

TP-1

Depth (Ft)	18'	6.4'
Temp (°C)	21.74	22.63
Cond(mS/cm)	0.583	0.527
DO	65.9% 5.76 mg/L	111.9% 9.69 mg/L
Turbidity (NTU)	8.4	2.1
pH (s.u.)	6.67	7.17
ORP (mV)	-9.9	17.4
PSIR	7.76	2.764

SW-03

Depth (Ft)	3.7'
Temp (°C)	18.48
Cond(mS/cm)	0.641
DO	47.3% 4.37 mg/L
Turbidity (NTU)	1.5
pH (s.u.)	6.94
ORP (mV)	43.1

SW-04

Depth (Ft)	0.693'
Temp (°C)	23.31
Cond(mS/cm)	0.527
DO	129.6% 11.02 mg/L
Turbidity (NTU)	1.9
pH (s.u.)	7.3
ORP (mV)	132.8

SW-05

Depth (Ft)	0.75'
Temp (°C)	21.81
Cond(mS/cm)	0.528
DO	114.3% 10.02 mg/L
Turbidity (NTU)	15.2
pH (s.u.)	8.1
ORP (mV)	91.4

SW-06

Depth (Ft)	0.722'
Temp (°C)	21.9
Cond(mS/cm)	0.532
DO	108.8% 9.54 mg/L
Turbidity (NTU)	1.8
pH (s.u.)	7.9
ORP (mV)	51.6

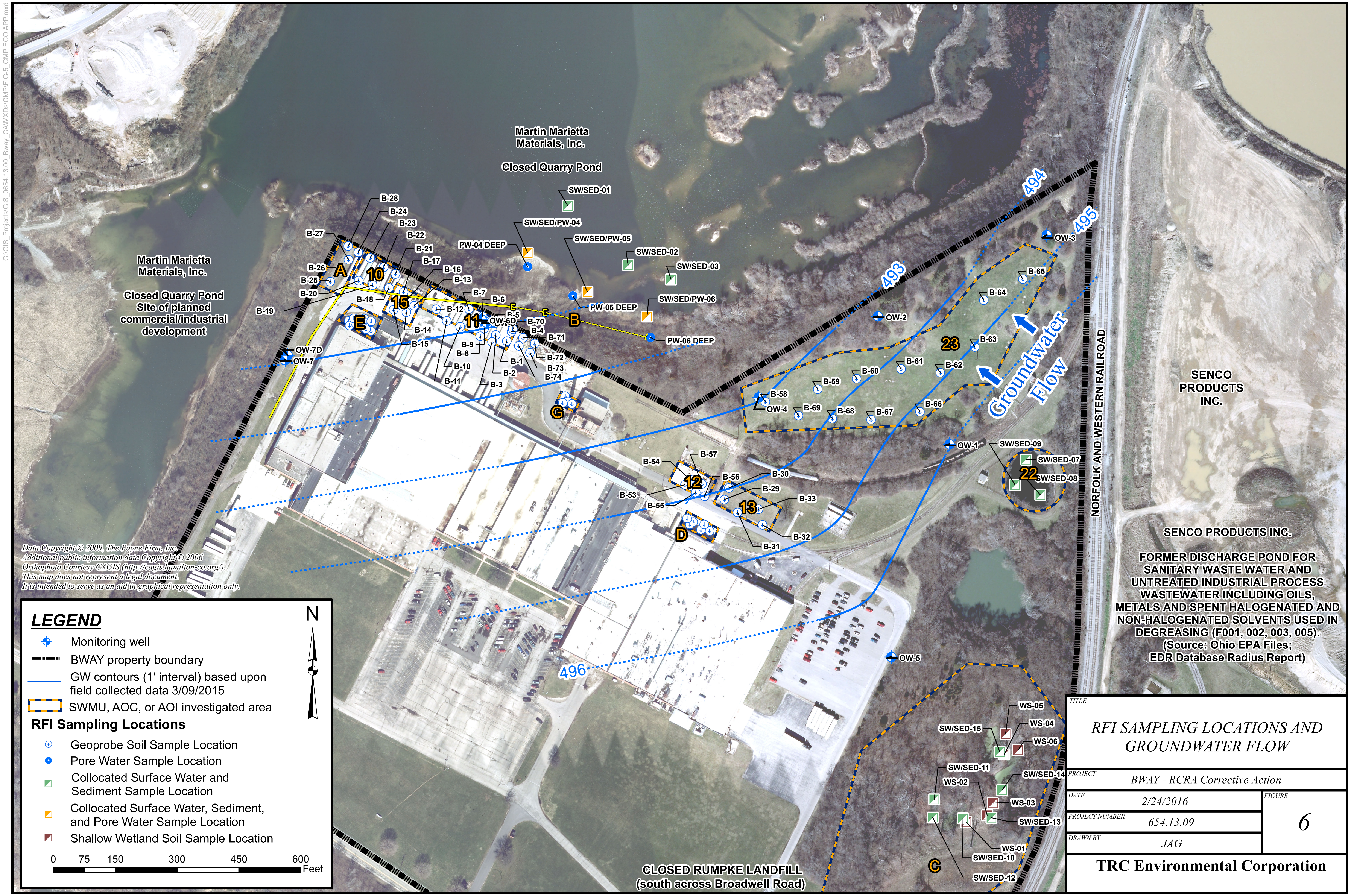
The Payne Firm, Inc.
Environmental Consultants
Cincinnati, OH / Cleveland, OH
Chicago, IL / Troy, NY

FIGURE NO.	5	*DATE*	12/18/2008
DRAWN BY	JAG	*REQUESTED BY*	KDK
PROJECT NO.	654.13.08		

PROJECT *BWAY - RCRA Corrective Action*

TITLE *SAMPLING AND ANALYSIS PLAN #3*
Surface Water Field Measured Parameters & Pond Transect Data

REFERENCE *Data Copyright © 2008, The Payne Firm, Inc. Additional public information data Copyright © 2006 Orthophoto Courtesy CAGIS (http://cagis.hamilton-co.org). This map does not represent a legal document. It is intended to serve as an aid in graphical representation only.*



TITLE

RFI SAMPLING LOCATIONS AND GROUNDWATER FLOW

PROJECT	*BWAY - RCRA Corrective Action*
DATE	*2/24/2016*
PROJECT NUMBER	*654.13.09*
DRAWN BY	*JAG*
FIGURE	*6*

TRC Environmental Corporation

ATTACHMENT 1
PHOTOGRAPHIC LOG

Photo 1: Little Miami River, looking northwest

Photo 2: SWMU 22 Storage Pond

Title:	Attachment 1	**Date:** **June/October 2008**
Site:	Bway Corporation, Cincinnati, Ohio	**Project-No.:** **02-20860A3**
Client:	The Payne Firm	ENVIRON

Photo 3: Vegetation surrounding SWMU 22 Storage Pond

Photo 4: Vegetation surrounding SWMU 22 Storage Pond

Title:	Attachment 1	**Date:** **June/October 2008**
Site:	Bway Corporation, Cincinnati, Ohio	**Project-No.:** **02-20860A3**
Client:	The Payne Firm	ENVIRON

Photo 5: SWMU 23 – Land Application Treatment Area (sprayfield)

Photo 6: SWMU 23 – Land Application Treatment Area (sprayfield)

Title:	Attachment 1	**Date: June/October 2008**
Site:	Bway Corporation, Cincinnati, Ohio	**Project-No.: 02-20860A3**
Client:	The Payne Firm	ENVIRON

Photo 7: Quarry pond to the north of the facility, looking north

Photo 8: Quarry pond to the west of the facility, looking east toward the facility

Title:	Attachment 1	**Date: June/October 2008**
Site:	Bway Corporation, Cincinnati, Ohio	**Project-No.: 02-20860A3**
Client:	The Payne Firm	ENVIRON

Photo 9: One of the ponds within AOI C

Photo 10: One of the ponds within AOI C

Title:	Attachment 1	**Date: June/October 2008**
Site:	Bway Corporation, Cincinnati, Ohio	**Project-No.: 02-20860A3**
Client:	The Payne Firm	ENVIRON

ENVIRON

December 22, 2008

Ohio Department of Natural Resources
Division of Natural Areas and Preserves
Ohio Natural Heritage Program
2045 Morse Road, Building F-1
Columbus, Ohio 43229-6693

Dear Sir or Madam:

This letter is a request for information on a 77-acre site located at 8200 Broadwell Road in Cincinnati, Hamilton County, Ohio (39°08'21" North latitude and 84°19'15" West longitude). The site is bounded on the north and west by gravel pit ponds, on the south by Broadwell Road, and on the east by the Norfolk and Western Railroad. This area is shown on the enclosed figures.

Areas to the northeast and east of the facility contain the only potential on-site ecological habitat. A sprayfield is located to the northeast of the facility, consisting of a regularly maintained grassy field, surrounded by a small stand of deciduous trees (see attached figure). A forested ravine area is located to the east of the facility (see attached figure). This area consists primarily of deciduous trees and contains at least two small gravel pit ponds and a few wet areas surrounding the ponds.

This request is submitted in support of a RCRA corrective action. Information regarding the presence of threatened and endangered species, other species of concern, critical or exemplary habitat, unique geological features, and culturally or archaeologically important features is requested.

Thank you for your assistance.

Sincerely,

Katrina Leigh

Katrina Leigh
Ecological Risk Assessor

Enclosure

ATTACHMENT 2
THREATENED AND ENDANGERED SPECIES CORRESPONDENCE

ENVIRON

December 22, 2008

Ohio Department of Natural Resources
Division of Natural Areas and Preserves
Ohio Natural Heritage Program
2045 Morse Road, Building F-1
Columbus, Ohio 43229-6693

Dear Sir or Madam:

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Areas to the northeast and east of the facility contain the only potential on-site ecological habitat. A sprayfield is located to the northeast of the facility, consisting of a regularly maintained grassy field, surrounded by a small stand of deciduous trees (see attached figure). A forested ravine area is located to the east of the facility (see attached figure). This area consists primarily of deciduous trees and contains at least two small gravel pit ponds and a few wet areas surrounding the ponds.

This request is submitted in support of a RCRA corrective action. Information regarding the presence of threatened and endangered species, other species of concern, critical or exemplary habitat, unique geological features, and culturally or archaeologically important features is requested.

Thank you for your assistance.

Sincerely,

Katrina Leigh

Katrina Leigh
Ecological Risk Assessor

Enclosure

DATA REQUEST FORM

OHIO DEPARTMENT OF NATURAL RESOURCES
DIVISION OF NATURAL AREAS AND PRESERVES
OHIO NATURAL HERITAGE PROGRAM
2045 MORSE RD., BLDG. F-1
COLUMBUS, OHIO 43229-6693
PHONE: 614-265-6453; FAX: 614-267-3096

INSTRUCTIONS:
Please complete both sides of this form, sign and return it to the address or fax number given above along with: **(1)** a brief letter describing your project, and **(2)** a map detailing the boundaries of your project site. A copy of the pertinent portion of a USGS 7.5 minute topographic map is preferred but other maps are acceptable. Our turnaround time is two weeks, although we can often respond more quickly. If you fax in your request you do not need to mail the original unless otherwise requested.

FEES:
Fees are determined by the amount of time it takes to complete your project. The charge is $50.00 per half hour with a one hour minimum. A cost estimate can be provided upon request. An invoice will be included with our response.

WHAT WE PROVIDE: The Natural Heritage Database is the most comprehensive source of information on the location of Ohio's rare species and significant natural features. Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Records for the following will be provided from the Natural Heritage Database: plants and animals (state and federal listed species), high quality examples of natural plant communities, geologic features, breeding animal concentrations, and unprotected natural areas. In addition, we report locations for managed areas including federal, state, county, local and non-profit areas, as well as state and national scenic rivers. Natural Heritage Data can be provided in many formats, including GIS shapefiles, spreadsheets, printed reports or maps. A minimum one mile radius around the project site will automatically be searched. Because Natural Heritage data is sensitive information, it is our policy to provide only the data needed to complete your project.

****

Date: December 22, 2008

Company name: ENVIRON International Corporation

Your name: Katrina Leigh

Address: 13801 West Center Street, P.O. Box 405

City/State/Zip: Burton, Ohio 44021

Phone: (440)834-1460 Fax: (440)834-1560

E-mail address: kleigh@environcorp.com

Project Name: Bway Corporation Metal Container Manufacturing Facility

Project Number: 0220860A

Project Site Address: 8200 Broadwell Road, Cincinnati, Ohio

Project County: Hamilton County

Project Township: Anderson Township

Project site is located on the following USGS 7.5 minute topographic quad(s):

Maderia, Ohio and Withamsville, Ohio (see attached letter for coordinates)

Description of project: See attached letter.

How do you want your data reported? Printed list and map X GIS shapefile

Other format (please specify):

Additional information required:

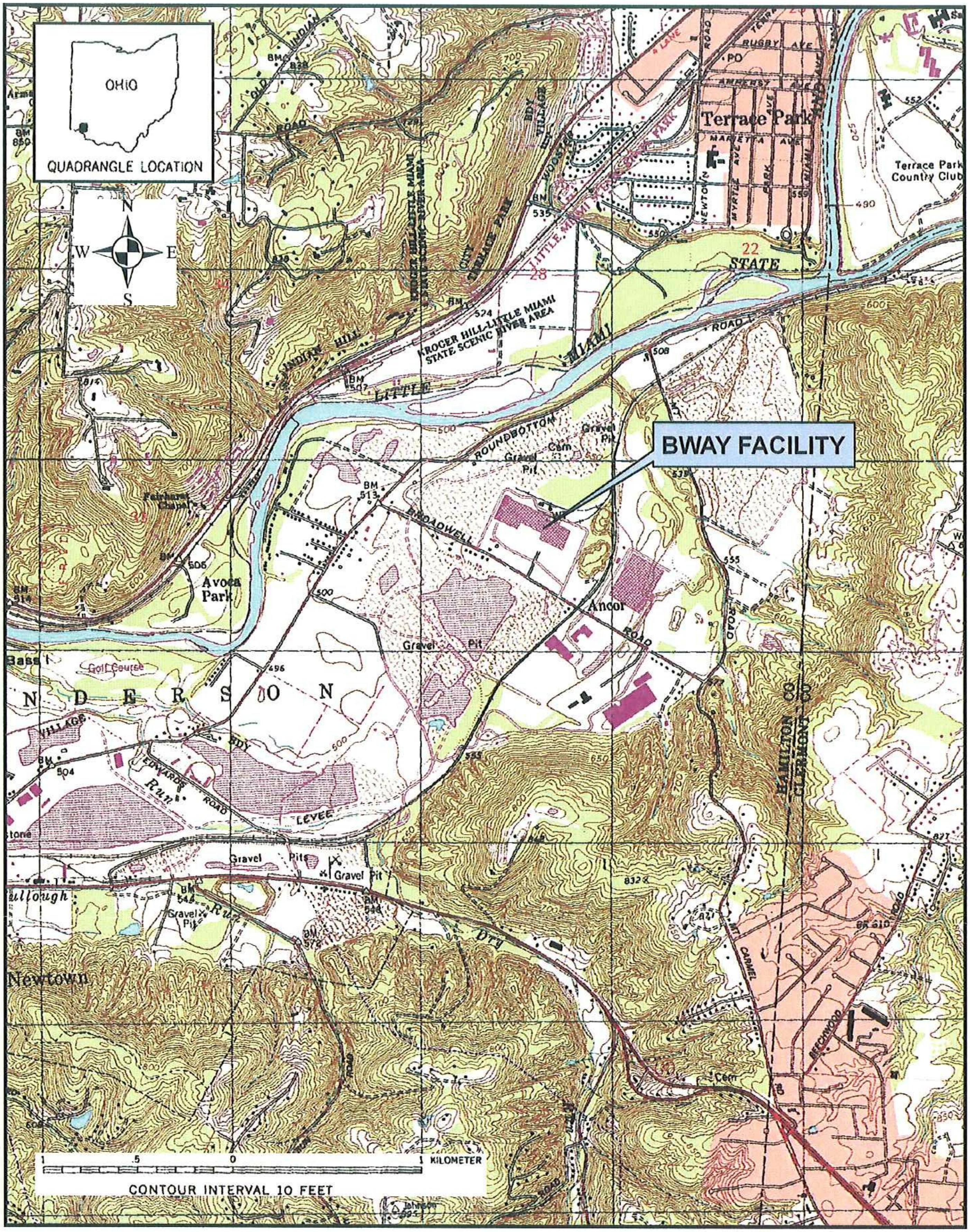
How will the information be used? In support of a RCRA corrective action.

I certify that data supplied by the Ohio Natural Heritage Program will not be published without crediting the ODNR Division of Natural Areas and Preserves as the source of the material. In addition, I certify that electronic datasets will not be distributed to others without the consent of the Division of Natural Areas and Preserves, Ohio Natural Heritage Program.

Signature Katie Chreigh

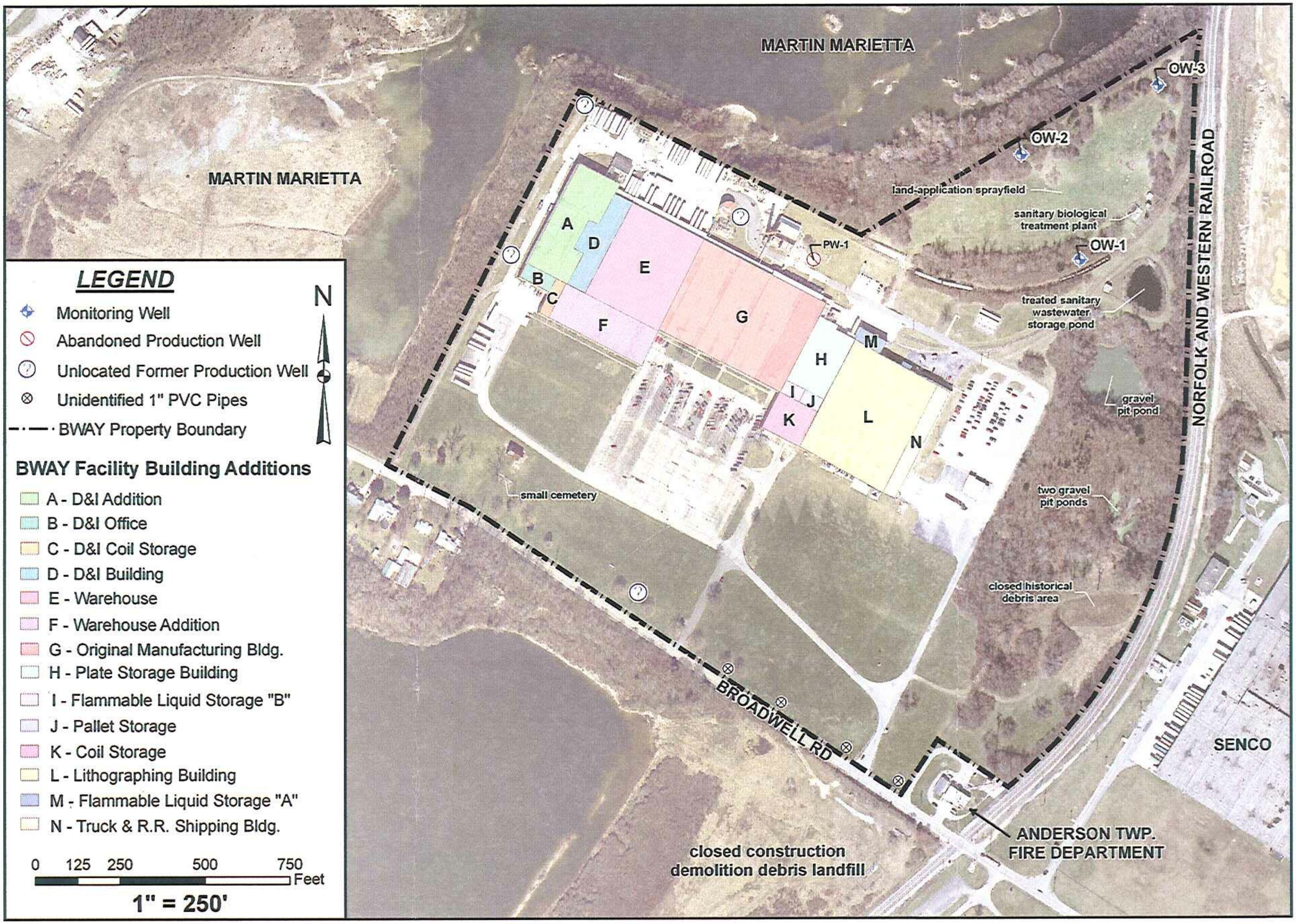
Date: 12-22-08

DNR 5203
REV 2/2008



PROJECT	BWAY - RCRA Corrective Action	FIGURE NO. 1	DATE 10/15/07		The Payne Firm, Inc. Environmental Consultants Cincinnati / Cleveland / Chicago
TITLE	BWAY Facility Location	DRAWN BY MDB	REQUESTED BY KDK		
		PROJECT NO. 654.13.02			

REFERENCE United States Geologic Survey (USGS) 7.5 Minute Quadrangle Map for Maderia, Ohio and Withamsville, Ohio (revised, 1999).



PROJECT	BWAY - RCRA Corrective Action	FIGURE NO. 2	DATE 11/5/07	The Payne Firm, Inc. Environmental Consultants Cincinnati / Cleveland / Chicago
TITLE	Facility Layout and Features	DRAWN BY MDB	REQUESTED BY KDK	
		PROJECT NO. 654.13.02		
REFERENCE	2006 Orthophoto Courtesy CAGIS; Heekin Can Drawing No. 60180363			

Ohio Department of Natural Resources

TED STRICKLAND, GOVERNOR | SEAN D. LOGAN, DIRECTOR

Division of Natural Areas and Preserves
Steven D. Maurer, Chief
2045 Morse Rd., Bldg. F-1
Columbus, OH 43229-6693
Phone: (614) 265-6453; Fax: (614) 267-3096

December 30, 2008

Katrina Leigh
Environ International Corp.
13801 W. Center St.
PO Box 405
Burton, OH 44021

Dear Ms. Leigh:

I have reviewed our Natural Heritage maps and files for the Bway Corp. Resource Conservation and Recovery Act (RCRA) Corrective Action project area, including a one mile radius, at 8200 Broadwell Rd. in Anderson Township, Hamilton County, and on the Madeira Quad (0220860A). The numbers/letters on the list below correspond to the areas marked on the accompanying map. Common name, scientific name and status are given for each species. Status codes are defined as: E=endangered, T=threatened, P=potentially threatened and SC=species of concern.

Madeira Quad

A. Little Miami Kroger Hill Nature Preserve - ODNR, Division of Natural Areas & Preserves
B. Little Miami Scenic State Park - ODNR, Division of Parks & Recreation
C. Little Miami State and National Scenic River
D. Avoca Park - Hamilton Co. Park District

1. Oak-Maple Forest Plant Community
2. *Obliquaria reflexa* - Threehorn Wartyback, T
   Anodonta suborbiculata - Flat Floater, SC
   Noturus eleutherus - Mountain Madtom, E
   Truncilla donaciformis - Fawnsfoot, T
   Truncilla truncata - Deertoe, SC
   Salix caroliniana - Carolina Willow, P
3. *Graptemys pseudogeographica* - False Map Turtle, SC
   Obliquaria reflexa - Threehorn Wartyback, T
   Anodonta suborbiculata - Flat Floater, SC
   Noturus eleutherus - Mountain Madtom, E
   Truncilla donaciformis - Fawnsfoot, T
   Truncilla truncata - Deertoe, SC
   Salix caroliniana - Carolina Willow, P
4. *Porzana carolina* - Sora, SC

5. *Obliquaria reflexa* - Threehorn Wartyback, T
   Anodonta suborbiculata - Flat Floater, SC
   Noturus eleutherus - Mountain Madtom, E
   Truncilla donaciformis - Fawnsfoot, T
   Truncilla truncata - Deertoe, SC
   Salix caroliniana - Carolina Willow, P
   Noturus stigmosus - Northern Madtom, E
6. *Obliquaria reflexa* - Threehorn Wartyback, T
   Anodonta suborbiculata - Flat Floater, SC
   Noturus eleutherus - Mountain Madtom, E
   Truncilla donaciformis - Fawnsfoot, T
   Truncilla truncata - Deertoe, SC
   Salix caroliniana - Carolina Willow, P

This project is located near the Little Miami State and National Scenic River. Please coordinate with Southwest Ohio Scenic River Manager, John Wolary, to ensure minimal impacts to this exceptional aquatic resource. Mr. Wolary can be reached at 513-934-0751.

We are unaware of any geologic features, state forests or state wildlife areas within a one mile radius of the project area.

Our inventory program has not completely surveyed Ohio and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area. Please note that although we inventory all types of plant communities, we only maintain records on the highest quality areas.

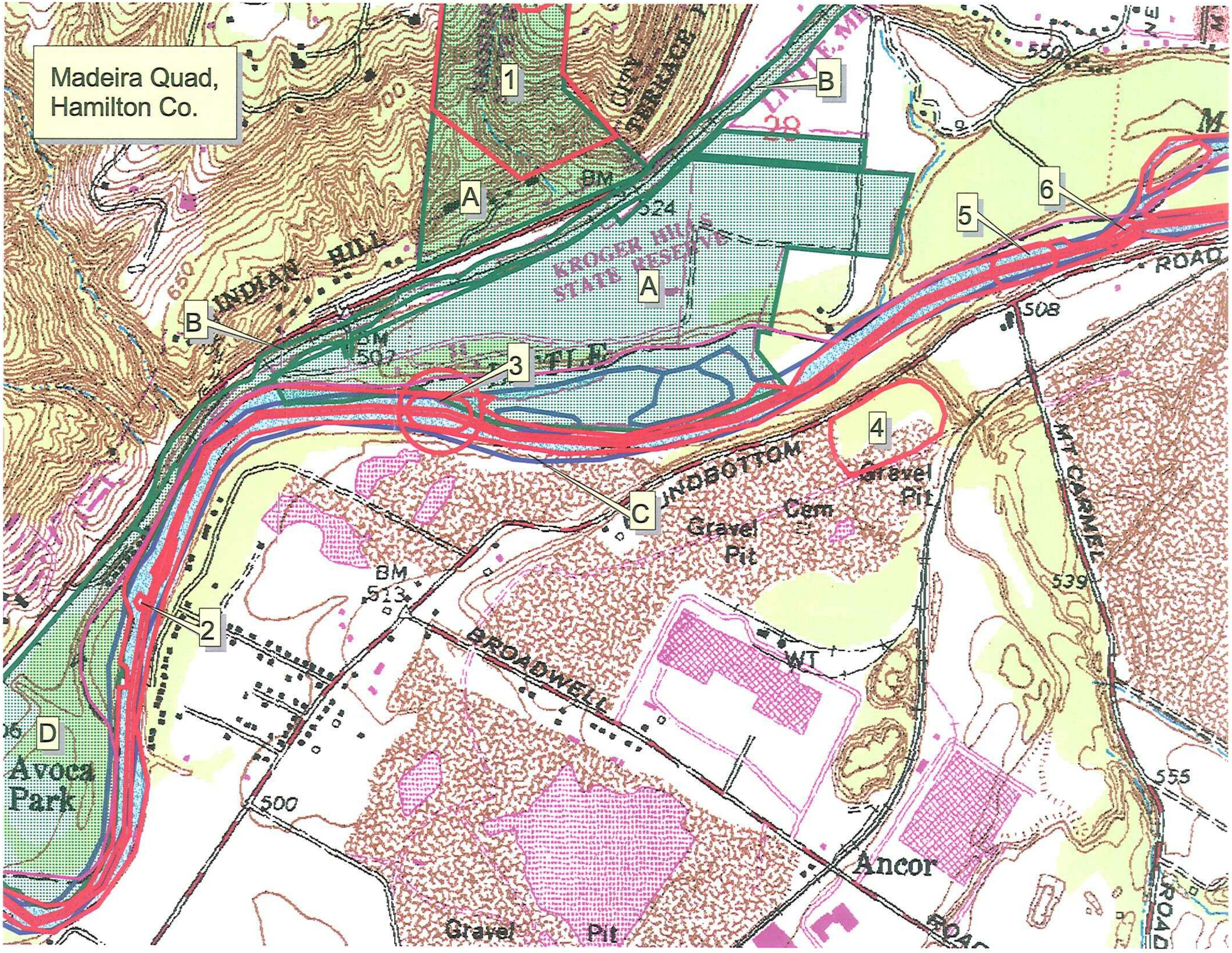
Please contact me at 614-265-6818 if I can be of further assistance.

Sincerely,

Debbie Woischke

Debbie Woischke, Ecological Analyst
Natural Heritage Program

cc John Wolary, ODNR-DNAP, Southwest Ohio Scenic River Manager


Madeira Quad,
Hamilton Co.
1
2
3
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A
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KROGER HILLS
STATE RESERVE
INDIAN HILL
Avoca
Park
LINDBOTTOM
BROADWELL
MT CARMEL
ROAD
Ancor
Gravel Pit
Gravel Pit
Gravel Pit
Cem
WT
BM
524
BM
507
BM
513
508
539
555
550
500
700
650

ENVIRON

December 9, 2008

Dr. Mary Knapp
U.S. Fish and Wildlife Service
6950 Americana Parkway
Suite H
Reynoldsburg, Ohio 43068-4127

Dear Dr. Knapp:

This letter is a request for information on a 77-acre site located at 8200 Broadwell Road in Cincinnati, Hamilton County, Ohio (39°08'21" North latitude and 84°19'15" West longitude). The site is bounded on the north and west by gravel pit ponds, on the south by Broadwell Road, and on the east by the Norfolk and Western Railroad. This area is shown on the enclosed figures.

Areas to the northeast and east of the facility contain the only potential on-site ecological habitat. A sprayfield is located to the northeast of the facility, consisting of a regularly maintained grassy field, surrounded by a small stand of deciduous trees (see attached figure). A forested ravine area is located to the east of the facility (see attached figure). This area consists primarily of deciduous trees and contains at least two small gravel pit ponds and a few wet areas surrounding the ponds.

This request is submitted in support of a RCRA corrective action. Information regarding the presence of threatened and endangered species, other species of concern, critical or exemplary habitat, unique geological features, and culturally or archaeologically important features is requested.

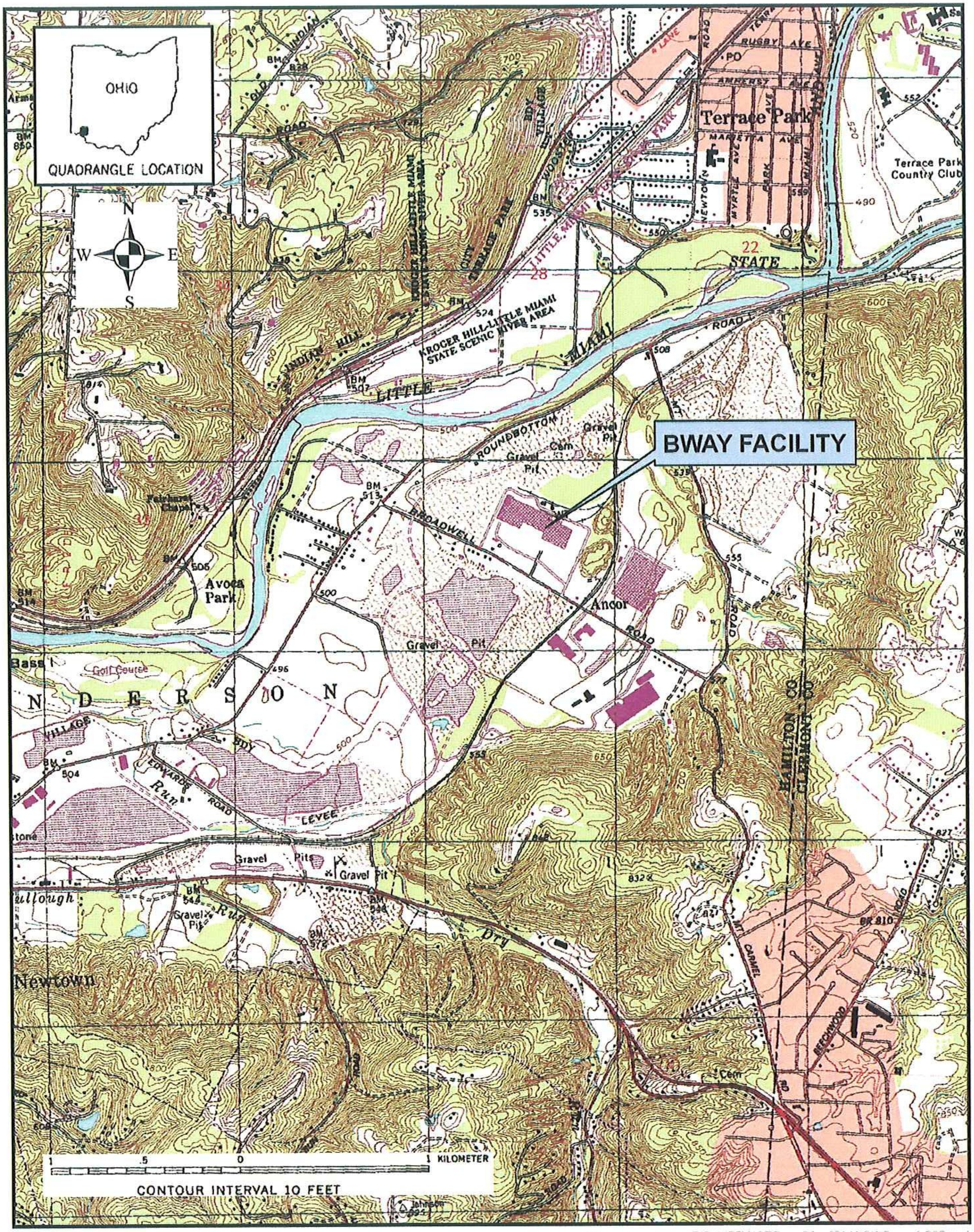
Thank you for your assistance.

Sincerely,

Katrina Leigh

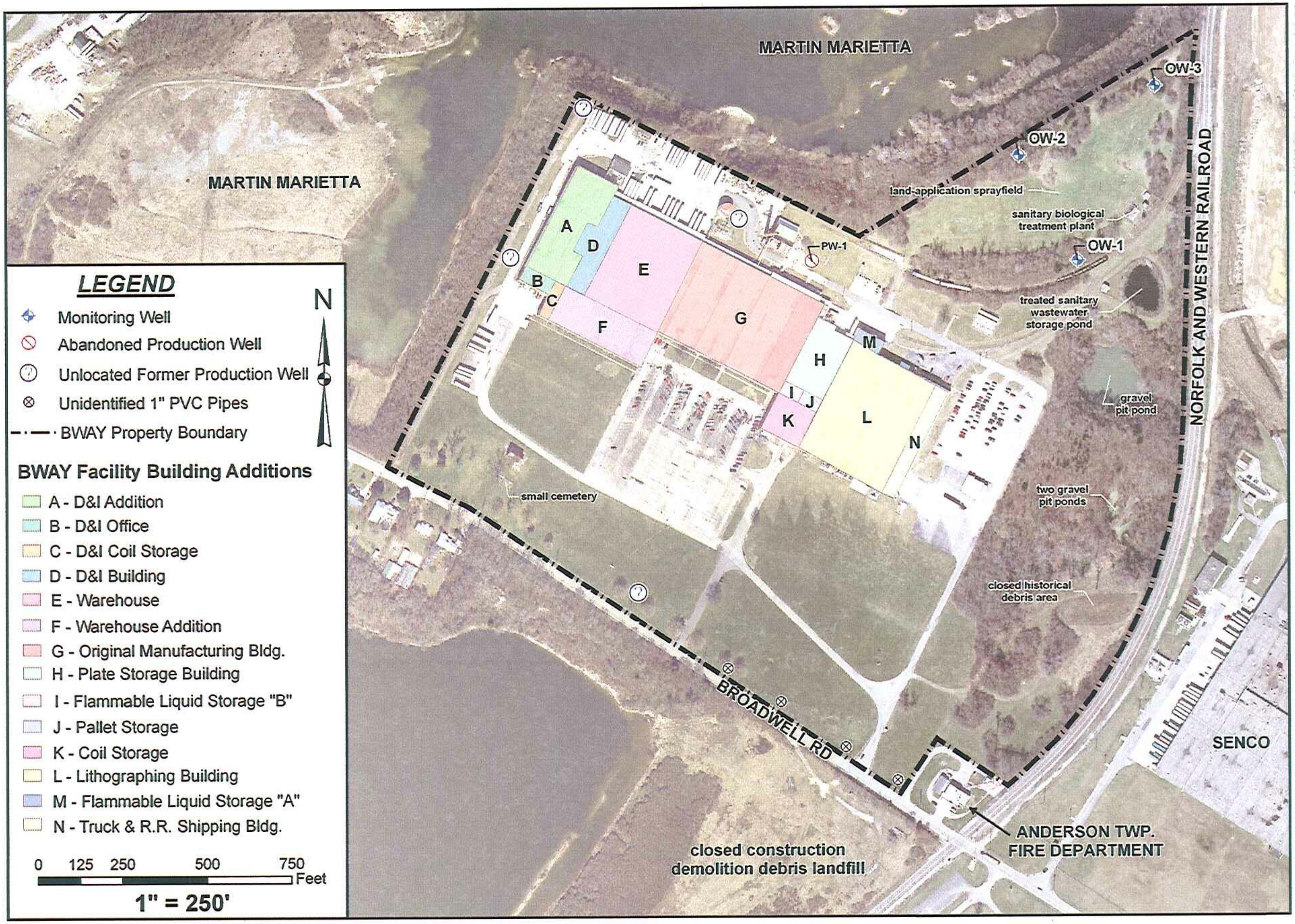
Katrina Leigh
Ecological Risk Assessor

Enclosure



PROJECT *BWAY - RCRA Corrective Action*	FIGURE NO. *1*	DATE *10/15/07*	**The Payne Firm, Inc.** Environmental Consultants Cincinnati / Cleveland / Chicago
TITLE *BWAY Facility Location*	DRAWN BY *MDB*	REQUESTED BY *KDK*	
	PROJECT NO. *654.13.02*		

REFERENCE *United States Geologic Survey (USGS) 7.5 Minute Quadrangle Map for Maderia, Ohio and Withamsville, Ohio (revised, 1999).*



PROJECT	BWAY - RCRA Corrective Action
TITLE	Facility Layout and Features
REFERENCE	2006 Orthophoto Courtesy CAGIS; Heekin Can Drawing No. 60180363
FIGURE NO.	2
DATE	11/5/07
DRAWN BY	MDB
REQUESTED BY	KDK
PROJECT NO.	654.13.02

The Payne Firm, Inc.
Environmental Consultants
Cincinnati / Cleveland / Chicago

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
614-416-8993 / FAX 614-416-8994

January 29, 2009

Ms. Katrina Leigh
Environ
13801 West Center Street
Suite 1
P.O. Box 405
Burton, Ohio 44021

TAILS: 31420-2009-TA-0194

Dear Ms. Leigh:

This is in response to your December 9, 2008 letter requesting information about threatened and endangered species within the vicinity of a 77-acre site located at 8200 Broadwell Road in Cincinnati, Hamilton County, Ohio. The site currently contains a developed facility, maintained grassy field, small stand of deciduous trees, and forested ravine with several gravel ponds. This information is requested as part of a RCRA corrective action.

There are no Federal wildlife refuges, wilderness areas, or Critical Habitat within the vicinity of this site.

In general, the U.S. Fish and Wildlife Service recommends that proposed projects minimize water quality impacts and impacts to quality fish and wildlife habitat, such as forests, streams, and wetlands. We recommend that impacts to streams and wetlands be avoided, and buffers surrounding these systems be preserved. Naturally vegetated buffers are important in preserving their wildlife-habitat and water quality-enhancement properties. All disturbed areas should be mulched and re-vegetated with native plants. Any unavoidable impacts to aquatic resources should be adequately offset by appropriate compensatory mitigation.

ENDANGERED SPECIES COMMENTS:

The proposed project lies within range of the **Indiana bat** (*Myotis sodalis*) a Federally-listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During winter, Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;
(2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;
(3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

Should the proposed site contain trees or associated habitats exhibiting any of the characteristics listed above, we recommend that the habitat and surrounding trees be saved wherever possible. If the trees must be cut, further coordination with this office is requested to determine if surveys are warranted. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office.

The proposed project lies within the range of **running buffalo clover** (*Trifolium stoloniferum*), a Federally-listed endangered species. Known locations of this plant species occur within 3 miles of the proposed project This species can be found in partially shaded woodlots, mowed areas (lawns, parks, cemeteries), and along streams and trails. Running buffalo clover requires periodic disturbance and a somewhat open habitat to successfully flourish, but cannot tolerate full-sun, full-shade, or severe disturbance. If suitable habitat is present, we recommend that surveys for this species be conducted by a trained botanist in May or June when the plant is in flower. More information on the consultation requirements for this species can be obtained at:
http://www.fws.gov/midwest/reynoldsburg/endangered/rb_clover_workshop.html

The proposed project lies within the range of the **sheepnose mussel** (*Plethobasus cyphyus)* and the **snuffbox mussel** (*Epioblasma triquetra*). These species are primarily known from larger streams in swift currents of riffles and shoals over gravel and sand with occasional cobble and boulders. Due to the project location and onsite habitat no impact is expected for these species.

This technical assistance letter is submitted in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C.661 et seq.), the Endangered Species Act of 1973, as amended, and is consistent with the intent of the National Environmental Policy Act of 1969, and the U.S. Fish and Wildlife Service's Mitigation Policy. Please note that consultation under section 7 of the ESA may be warranted for this project if suitable habitat for Federally-listed species may be impacted by this project. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

If you have any questions regarding our response or if you need additional information, please contact Jennifer Finfera at extension 13.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Field Supervisor

cc: ODNR, DOW, SCEA Unit, Columbus, OH

Appendix V

Entire Report on CD-Rom

- **Includes Quarterly Reports with Lab and Field Data from the RFI**