K.03
4/2010

BASELINE RISK ASSESSMENT

SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Prepared For:
South Dayton Dump Site PRP Group

US EPA RECORDS CENTER REGION 5
489890

CONESTOGA-ROVERS
& ASSOCIATES

651 Colby Drive, Waterloo, Ontario, Canada N2V 1C2
Telephone: 519-884-0510 Facsimile: 519-884-0525

April 30, 2010

Reference No. 038443-87

Ms. Karen Cibulskis
Remedial Project Manager
United States Environmental Protection Agency
Region V
77 West Jackson Boulevard
Mail Code SR-6J
Chicago, IL 60604

Dear Ms. Cibulskis:

Re: Remedial Investigation Report Operable Unit 1 (OU1) and Baseline Risk Assessment
South Dayton Dump and Landfill Site, Moraine, Ohio (Site)

Please find enclosed two hardcopies and two compact disk copies of the reports entitled "Remedial Investigation Report - Operable Unit 1 (OU1)" (RI), and "Baseline Risk Assessment" (BRA) for the South Dayton Dump and Landfill Site, in Moraine, Ohio.

These reports are submitted in accordance with the Administrative Settlement and Order on Consent (ASAOC) for Remedial Investigation/Feasibility Study (RI/FS) Proceeding Under Sections 104, 107, and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. SS 9604, 9607, and 9622 (United States Environmental Protection Agency [USEPA]) Docket No. V-W-06-C-852) effective August 15, 2006.

The Respondents to the ASAOC (Respondents) would like to suggest a series of meetings with USEPA and the Ohio Environmental Protection Agency to discuss the RI and BRA, and the OU1 Feasibility Study, which will be submitted to USEPA on May 14, 2010. The Respondents suggest holding the first meeting in July 2010 at a mutually agreed upon date and time with subsequent meetings to be held as required.

Should you have any questions on the above, please do not hesitate to contact us.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Stephen M. Quigley

VC/ca/81
Encl.

cc: Tim Prendiville, USEPA (hard copy and CD)
Matt Justice, Ohio EPA (hard copy and CD)
Robert Frank, CH2M Hill (CD)
Scott Blackhurst, Kelsey Hayes Company (CD)
Wray Blattner, Thompson Hine (CD)
Ken Brown, ITW (CD)
Kelly Smith, Terran (CD)
Tim Hoffman, Dinsmore & Shohl (CD)
Paul Jack, Castle Bay (CD)
Robin Lunn, Winston & Strawn (CD)
John Hartje, NCR (CD)
Karen Mignone, Verrill Dana (CD)
Adam Loney, CRA (CD)
Jim Campbell, EMI (CD)
Chris Athmer, Terran (CD)

CONESTOGA-ROVERS & ASSOCIATES

8615 W. Bryn Mawr Avenue, Chicago, Illinois 60631
Telephone: (773) 380-9933 Fax: (773) 380-6421
www.CRAworld.com

TRANSMITTAL

DATE: April 30, 2010

REFERENCE NO.: 38443-87

PROJECT NAME: South Dayton Dump and Landfill Site

TO: Karen Cibulskis, Remedial Project Manager
United States Environmental Protection Agency
77 West Jackson Boulevard
Mail Code SR-6J
Chicago, IL 60604

Please find enclosed:
- ☐ Draft
- ☐ Originals
- ☐ Prints
- ☒ Final
- ☐ Other

Sent via:
- ☐ Mail
- ☒ Overnight Courier
- ☐ Same Day Courier
- ☐ Other

QUANTITY	DESCRIPTION
1	Remedial Investigation Report - Operable Unit 1 (OU1); hard copy
1	compact disk copy of Remedial Investigation Report - Operable Unit 1 (OU1)
1	Baseline Risk Assessment Report; hard copy
1	compact disk copy of Baseline Risk Assessment

- ☐ As Requested
- ☐ For Your Use
- ☐ For Review and Comment
- ☐
- ☐

COMMENTS:

Copy to: Filing

Completed by: Valerie Chan [Please Print]

Signed: Valerie Chan

Filing: Correspondence File

EQUAL EMPLOYMENT OPPORTUNITY EMPLOYER

REGISTERED COMPANY FOR ISO 9001 ENGINEERING DESIGN

BASELINE RISK ASSESSMENT

SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Prepared For:
South Dayton Dump Site PRP Group

Prepared by:
Conestoga-Rovers & Associates

651 Colby Drive
Waterloo, Ontario
Canada N2V 1C2

Office: 519•884•0510
Fax: 519•884•0525

APRIL 2010
REF. NO. 038443 (11)

TABLE OF CONTENTS

Page

1.0 BASELINE RISK ASSESSMENT 1
1.1 OBJECTIVE OF THE BRA 2
1.2 ORGANIZATION OF THE BRA 3

2.0 SITE CHARACTERIZATION 5
2.1 SITE LOCATION 5
2.2 SITE FEATURES 5
2.3 LAND USE 6
2.4 SITE HISTORY 8
2.5 PHYSIOGRAPHY 9
2.5.1 TOPOGRAPHY 9
2.5.2 STORM WATER DRAINAGE PATTERNS 9
2.5.3 PONDS 10
2.5.4 GREAT MIAMI RIVER (GMR) 11
2.5.5 WETLANDS 11
2.5.6 TERRESTRIAL HABITATS 12
2.5.6.1 SPECIES OF POTENTIAL CONCERN 14
2.6 SAMPLING HISTORY 15
2.7 SITE GEOLOGY/HYDROGEOLOGY 16
2.7.1 GEOLOGY 16
2.7.2 HYDROGEOLOGY 18
2.7.3 HYDROLOGY 22

3.0 BASELINE HUMAN HEALTH RISK ASSESSMENT (HHRA) 24
3.1 HAZARD IDENTIFICATION 25
3.1.1 HHRA CONCEPTUAL SITE MODEL (CSM) 25
3.1.2 RECEPTOR CHARACTERISTICS 27
3.1.3 SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPCs) 29
3.1.3.1 SCREENING CRITERIA 30
3.1.3.2 SUMMARY OF COPC SELECTION 31
3.2 EXPOSURE ASSESSMENT 34
3.2.1 CHARACTERIZATION OF EXPOSURE SETTING 35
3.2.1.1 CURRENT LAND USE 35
3.2.1.2 FUTURE LAND USE 36
3.2.2 IDENTIFICATION OF POTENTIAL EXPOSURE PATHWAYS 36
3.2.2.1 RELEASE MECHANISMS 37
3.2.2.2 FATE AND TRANSPORT IN RECEIVING MEDIA 37
3.2.2.2.1 POTENTIAL MIGRATION OF SOIL GAS AND GROUNDWATER COPCs TO AIR 38
3.2.2.3 POTENTIAL EXPOSURE POINTS 38

TABLE OF CONTENTS

		Page
3.2.2.4	POTENTIAL EXPOSURE ROUTES	39
3.2.2.5	EXPOSURE SCENARIOS AND COMPLETED EXPOSURE PATHWAYS	39
3.2.3	QUANTIFICATION OF EXPOSURE	41
3.2.3.1	EXPOSURE ESTIMATES	43
3.2.3.1.1	SPECIFIC INTAKE EQUATIONS	43
3.2.3.2	EXPOSURE SCENARIO ASSUMPTIONS	48
3.2.3.2.1	TRESPASSER	48
3.2.3.2.2	INDUSTRIAL/COMMERCIAL WORKER	50
3.2.3.2.3	CONSTRUCTION/UTILITY WORKER	52
3.2.3.2.4	RESIDENT	54
3.2.3.3	EVALUATION OF EXPOSURES TO LEAD IN SOIL AND WATER	56
3.2.3.3.1	ADULT LEAD EXPOSURE	56
3.2.3.3.2	CHILD LEAD EXPOSURE	59
3.3	TOXICITY ASSESSMENT	60
3.3.1	DOSE RESPONSE ASSESSMENT	61
3.3.1.1	NON-CARCINOGENIC HAZARDS	62
3.3.1.2	CARCINOGENIC RISKS	63
3.3.2	POTENTIAL RISK FROM CARCINOGENS	64
3.4	RISK CHARACTERIZATION	65
3.4.1	HAZARD ESTIMATES	65
3.4.2	CANCER RISK ESTIMATES	66
3.4.3	QUANTIFICATION OF HEALTH RISKS	67
3.4.4	QUANTITATIVE INTERPRETATION OF HEALTH RISKS	67
3.4.4.1	ON-SITE TRESPASSER	68
3.4.4.2	ON-SITE INDUSTRIAL/COMMERCIAL WORKER	68
3.4.4.3	ON-SITE CONSTRUCTION/UTILITY WORKER	70
3.4.4.4	OFF-SITE RESIDENT	71
3.4.4.5	OFF-SITE INDUSTRIAL/COMMERCIAL WORKER	72
3.4.5	SUMMATION OF RISKS	72
3.4.5.1	TRESPASSERS	74
3.4.5.2	INDUSTRIAL/COMMERCIAL WORKERS	74
3.4.5.3	CONSTRUCTION/UTILITY WORKERS	75
3.4.5.4	OFF-SITE RESIDENT	75
3.4.5.5	OFF-SITE INDUSTRIAL/COMMERCIAL WORKER	75
3.4.6	SUMMARY OF EXCEEDANCES	76
3.4.7	RISK AND HAZARD COPC CONTRIBUTIONS	76
3.4.7.1	TRESPASSER	77
3.4.7.2	INDUSTRIAL/COMMERCIAL WORKER	77
3.4.7.3	CONSTRUCTION/UTILITY WORKER	78

TABLE OF CONTENTS

Page

3.4.7.4 OFF-SITE RESIDENT 79
3.4.7.5 OFF-SITE INDUSTRIAL/COMMERCIAL WORKER 81
3.4.8 HAZARD ASSESSMENT FOR LEAD EXPOSURE 81
3.5 UNCERTAINTY ANALYSIS 82
3.5.1 SAMPLING PROCEDURE BIAS 82
3.5.2 DATA QUALITY AND DATA QUALITY OBJECTIVES 83
3.5.3 EXPOSURE POINT CONCENTRATION ESTIMATES 85
3.5.4 EXPOSURE SCENARIO ASSUMPTIONS 85
3.5.5 DOSE RESPONSE 87
3.5.6 THEORETICAL NATURE OF RISK ESTIMATES 87
3.5.7 SYNERGISTIC, ADDITIVE, AND ANTAGONISTIC EFFECTS 88

4.0 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT (SLERA) 89
4.1 OVERVIEW OF THE ECOLOGICAL RISK ASSESSMENT PROCESS 89
4.1.1 RELATIONSHIP OF THIS SLERA TO OHIO GUIDANCE 91
4.2 STEP 1: SCREENING-LEVEL PROBLEM FORMULATION AND ECOLOGICAL EFFECTS EVALUATION 92
4.2.1 ENVIRONMENTAL SETTING 93
4.2.1.1 GREATER MIAMI RIVER 93
4.2.1.2 QUARRY POND 94
4.2.1.3 TERRESTRIAL HABITATS 95
4.2.1.4 WETLANDS 95
4.2.1.4.1 LARGE POND AND SMALL POND 95
4.2.1.5 RARE, THREATENED, AND ENDANGERED SPECIES 96
4.2.2 IDENTIFICATION OF COMPLETE EXPOSURE PATHWAYS/PRELIMINARY CONCEPTUAL SITE MODEL 97
4.2.2.1 ASSESSMENT ENDPOINTS 99
4.2.2.2 CONTAMINANTS KNOWN OR SUSPECTED TO OCCUR AT THE SITE 100
4.3 STEP 2: SCREENING-LEVEL EXPOSURE ESTIMATE AND RISK CALCULATION 101
4.3.1 SCREENING OF COPECS 101
4.3.2 ESVS FOR SOIL 102
4.3.3 ESVS FOR SEDIMENTS 104
4.3.4 ESVS FOR SURFACE WATER AND GROUNDWATER 106
4.3.5 RESULTS OF COPEC SCREENING 107
4.3.5.1 SOIL 107
4.3.5.2 SEDIMENT 108
4.3.5.3 QUARRY POND SURFACE WATER 109
4.3.5.4 GROUNDWATER 109
4.3.6 SCREENING OF BIOACCUMULATIVE COPECs WITH FOOD CHAIN MODELS 110

TABLE OF CONTENTS

Page

4.3.7 SOURCES OF TOXICITY REFERENCE VALUES (TRV) 112
4.3.8 ESTIMATION OF COPEC CONCENTRATIONS IN PREY 113
4.3.8.1 ESTIMATION OF COPEC CONCENTRATIONS IN WORMS....113
4.3.8.2 ESTIMATION OF COPEC CONCENTRATIONS IN SMALL MAMMALS 114
4.3.8.3 COPEC CONCENTRATIONS IN QUARRY POND AQUATIC BENTHOS/ADULTAQUATIC INSECTS 114
4.3.8.4 ESTIMATION OF COPEC CONCENTRATIONS IN QUARRY POND FISH....115
4.3.9 RESULTS OF SCREENING OF BIOACCUMULATIVE COPECS WITH FOOD CHAIN MODELS....116
4.4 REFINEMENTS TO SCREENING ANALYSES 118
4.4.1.1 RESCREENING OF COPECs IN SEDIMENTS/RISKS TO BENTHOS...118
4.4.1.2 RESCREENING OF COPECs IN SOIL/RISKS TO WORM-EATERS....118
4.5. ASSESSMENT OF EROSION RISKS TO GMR 119
4.6 RISK CHARACTERIZATION 122
4.7 UNCERTAINTY ANALYSIS....124
4.8 SCIENCE-MANAGEMENT DECISION INPUT POINT....125

5.0 SUMMARY AND CONCLUSIONS 129
5.1 HHRA SUMMARY/CONCLUSIONS 129
5.2 SLERA SUMMARY/CONCLUSIONS....131

6.0 REFERENCES....133

LIST OF FIGURES
(Following Text)

FIGURE 1.1	SITE LOCATION MAP
FIGURE 1.2	SITE PLAN
FIGURE 2.1	INVESTIGATIVE LOCATIONS - SOIL GAS
FIGURE 2.2	INVESTIGATIVE LOCATIONS - SOIL
FIGURE 2.3	INVESTIGATIVE LOCATIONS - GROUNDWATER
FIGURE 2.4	INVESTIGATIVE LOCATIONS - SURFACE WATER AND SEDIMENT
FIGURE 4.1	ECOLOGICAL CONCEPTUAL SITE MODEL

LIST OF TABLES
(Following Text)

TABLE 4.1	OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN (COPEC) IN SURFACE SOIL
TABLE 4.2	OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN IN SEDIMENT
TABLE 4.3	OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN IN GROUNDWATER
TABLE 4.4	RESCREENING OF INITIAL GROUNDWATER COPECs FOR SENTINEL WELLS FOR GMR
TABLE 4.5	RESCREENING OF INITIAL GROUNDWATER COPECs FOR SENTINEL WELLS FOR QUARRY POND
TABLE 4.6	LIST OF INITIAL COPECs
TABLE 4.7	PARAMETERS FOR FOOD CHAIN MODELS
TABLE 4.8	TOXICITY REFERENCE VALUES (TRV) AND SOURCES FOR FOOD CHAIN MODELS
TABLE 4.9	ESTIMATION OF COPEC CONCENTRATIONS IN TERRESTRIAL FOOD CHAIN
TABLE 4.10	ESTIMATION OF COPEC CONCENTRATIONS IN AQUATIC BENTHOS AND FISH
TABLE 4.11	ASSESSMENT OF RISK TO CONSUMERS OF SOIL INVERTEBRATES: SHREW AND WOODCOCK
TABLE 4.12	ASSESSMENT OF RISK TO CONSUMERS OF ADULT AQUATIC INSECTS: BROWN BAT AND TREE SWALLOW HAWK
TABLE 4.13	ASSESSMENT OF RISK TO CONSUMERS TOP PREDATORS: FOX AND RED-TAILED
TABLE 4.14	ASSESSMENT OF RISK TO PISCIVOROUS WILDLIFE: MINK AND GREAT BLUE HERON
TABLE 4.15	SEDIMENT CONCENTRATIONS VERSES PEC SCREENING VALUE

LIST OF TABLES
(Following Text)

TABLE 4.16 REASSESSMENT OF RISK TO CONSUMERS OF SOIL INVERTEBRATES USING MATC: SHREW AND WOODCOCK

TABLE 4.17 REASSESSMENT OF RISK TO CONSUMERS OF SOIL INVERTEBRATES USING LOAEL: SHREW AND WOODCOCK

TABLE 4.18 OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN (COPEC) IN OFF-SITE SEDIMENT

LIST OF APPENDICES

APPENDIX A	ANALYTICAL DATABASE
APPENDIX B	RISK CALCULATION TABLES
APPENDIX C	INDOOR AIR (J&E) MODELING
APPENDIX D	STATISTICAL METHODOLOGY
APPENDIX E	LEAD MODELING
APPENDIX F	ESTIMATION OF WORM UPTAKE FACTORS FOR PAHs
APPENDIX G	BIOACCUMULATION OF CHLORINATED ORGANICS

1.0 BASELINE RISK ASSESSMENT

Conestoga-Rovers & Associates (CRA) has prepared this Baseline Risk Assessment (BRA) for Operable Unit 1 (OU1) of the South Dayton Dump and Landfill Site (SDD) located in Moraine, Ohio (Site). A Site location map is presented on Figure 1.1 and a Site plan is presented on Figure 1.2.

The Site was originally defined in the Statement of Work (SOW), which formed Appendix A to the Administrative Settlement Agreement and Order on Consent (ASAOC). The Site was later divided into OU1 and OU2. On February 24, 2010, the USEPA, Ohio EPA, and the Respondents met to discuss the scope of the Streamlined RI/FS and agreed to the following revised boundaries for OU1 and OU2. OU1 comprises the Site as defined in the ASAOC, as well as adjacent parcels upon which waste was placed by the Site operators. Specifically, OU1 includes the following parcels as shown on Figure 1.2:

- Parcel 5054 (Valley Asphalt)
- Parcels 5171, 5172, 5173, 5174, 5175, 5176, 5177, and 5178 (Boesch and Grillot)
- Parcels 3753 and 4423 (Jim City Salvage)
- Parcels 4610 and 3252 (Ronald Barnett)
- Parcel 3274 and the portions of Parcels 3056, 3057, 3058, 3275, and 3278 upon which waste has been placed (Miami Conservancy District, "MCD")

The Streamlined OU1 FS will also include an assessment of treatment options for shallow groundwater (i.e., nominally at an elevation above approximately 675 ft AMSL, or above the first till layer, whichever is encountered first) beneath the Site[1].

OU2 includes the following areas not contained by OU1:

- Landfill material, surface and subsurface soil, and hot spots outside the OU1 Area (e.g., the floodplain[2] area between the Site and the Great Miami River (GMR))
- Deeper groundwater [i.e., nominally at elevations below 675 feet above mean sea level (ft AMSL), above the elevation of the Till-Rich Zone] within and outside the OU1 Area

---

1 The delineation of shallow groundwater is not absolute and where shallow OU1 groundwater contamination extends a short distance below 675 ft AMSL, the contamination below 675 ft AMSL would also be remediated where feasible and appropriate.

2 The MCD defines a floodplain as a strip of relatively flat and normally dry land alongside a stream, river or lake that is covered by water during a flood.

- Shallow groundwater outside the OU1 Area
- Leachate outside the OU1 Area (e.g., the floodplain area between the Site and the GMR)
- Landfill gas and soil vapor outside the OU1 Area
- Surface water and sediment outside the OU1 Area (e.g., the floodplain area between the Site and the GMR)
- Air outside the OU1 Area

This report constitutes the BRA Report for OU1. Where potential impacts to receptors in OU2 are identified in the BRA, these potential impacts will be investigated and addressed as part of the OU2 RI/FS. The BRA presents an evaluation of the potential exposure and human and ecological risks under both the current and planned future use of the Site for industrial/commercial purposes. The BRA was completed consistent with USEPA guidance described in Section 6.0 of this BRA. The basis of this evaluation is that no remediation has occurred at the Site.

1.1 OBJECTIVE OF THE BRA

In 2007, the United States Environmental Protection Agency (USEPA) prepared a Streamlined Risk Assessment (SRA) using the then available data for the Site. The data used in the preparation of the SRA were as much as 10 years old or older and were of varying levels of quality.

Subsequent to the preparation of the SRA, the Respondents completed geophysical, soil, landfill gas/soil vapor, and groundwater investigations and generated additional data with respect to contamination at the Site. The results of these investigations have been summarized in letter reports to USEPA and the Remedial Investigation (RI) report (CRA, April 2010). This BRA uses all the available data to more completely characterize the risks posed by the Site to human and ecological receptors. CRA notes that the validity of some of the historical data cannot be verified as information regarding sample collection and quality assurance/quality control procedures do not exist. However, CRA has used these data to supplement the data collected by CRA, which were collected in accordance with the USEPA-approved draft Field Sampling Plan and Quality Assurance Project Plan (QAPP). The chemical concentrations in the historical data are similar to concentrations in samples collected by CRA, which provides some confidence in the reliability of the historical data. The historical data serve to provide a more complete understanding of Site conditions and, for this reason, were included in the BRA.

The purpose of the BRA is to evaluate the potential human health and ecological risks posed by Site media under current and potential future Site conditions, assuming no additional remedial actions are taken at the Site. The specific goals of the risk assessments are:

- Identify and provide analysis of baseline risks (defined as risks that might exist if no further remediation were conducted at the Site) and identify what areas of the Site may require further remedial action
- Provide a basis for determining the level of chemicals that can remain on Site and still not adversely impact human health and the environment
- Provide a basis for comparing potential health and environmental impacts of various remedial alternatives

1.2 ORGANIZATION OF THE BRA

The BRA is organized as follows:

- Section 1.0: Introduction

  Presents background information relevant to this BRA, presents the purpose of this BRA, and outlines the organization of this BRA

- Section 2.0: Site Characterization

  Presents a brief Site overview and history, the nature and extent of the contamination, and the geological and hydrogeological conditions present at the Site

- Section 3.0: Baseline Human Health Risk Assessment

  Presents a summary of the potential human exposure pathways, the conceptual site model (CSM), the selection of Contaminants of Potential Concern (COPCs), the risk characterization and toxicity data used to calculate the non-carcinogenic hazards and carcinogenic risks, and quantifies exposure based on the exposure assumptions

- Section 4.0: Baseline Ecological Risk Assessment

  Presents a summary of the potential ecological exposure pathways, the ecological CSM, the selection of COPCs, the risk characterization and toxicity data used to calculate the non-carcinogenic hazards and

carcinogenic risks, and quantifies exposure based on the exposure assumptions

- Section 5.0: Summary and Conclusions

  Presents a summary of the findings of the BRA

A list of references cited in the BRA is presented in Section 6.0 of this document.

2.0 SITE CHARACTERIZATION

2.1 SITE LOCATION

The Site is located at 1901 through 2153 Dryden Road and 2225 East River Road in Moraine, Ohio. The Site location is shown on Figure 1.1. The Site is bounded to the north and west by the Miami Conservancy District (MCD) floodway (part of which is included in the definition of the Site), the Great Miami River Recreational Trail and the Great Miami River (GMR) beyond, to the east by Dryden Road with light industrial facilities beyond, to the southeast by residential and commercial properties with East River Road and a residential trailer park beyond, and to the south by undeveloped land with industrial facilities beyond. The Site has been defined in the SOW as an area of approximately 80 acres, including the Valley Asphalt plant in the northernmost portion of the Site (Parcel 5054), an auto salvage yard in the southeast and a gravel pit/quarry pond in the southern part of the Site. The central 40 acres (described as 23 acres in some documents) of the Site were referred to as the South Dayton Dump and Landfill in some reports. More recent information including an undated tax map in the Montgomery County Health District (MCHD) files, soil boring logs, drums found at Valley Asphalt, USEPA's air photo analysis, underground storage tank (UST) closure reports, the deposition of Horace (Jack) Boesch Jr., and investigations completed as part of the RI indicate that landfilling or other waste disposal or handling activities occurred across most of the Site and that the Site extends partially onto the adjacent MCD-owned floodway to the west of the Site.

2.2 SITE FEATURES

The Site is located on a flat parcel of land which has undergone extensive grading and backfilling associated with prior gravel mining and landfill activities. A heavily vegetated man-made embankment is present along the central (Parcel 5177) portion of the Site, and extends past the northern and western boundary of Parcel 5054, along the GMR. According to Jack Boesch (son of one historic owner/operator of the Site) the embankment was constructed by the Site owners/operators of fill materials, possibly including slag, ash and foundry-type sands. Portions of the embankment are located on the MCD property. The grassy area between the berm and the GMR is part of the 100-year floodway and owned by the MCD.

Several drum remnants were present along the surface of, and partially buried within, the north embankment. Some municipal waste was also observed on the surface

directly adjacent to the former air curtain destructor[3] (ACD) to the northwest of the depression. The topography of the Site is somewhat variable, with a depression area in the west-central portion of Parcel 5177, several mounded areas of fill and a ravine along the south-central part of Parcel 5177, and a low-lying area along the entire southern portion of the Site. The topography in the area of the embankment suggests that during the periods of filling, waste haulers drove along the perimeter haul roads around the west-central portion of the Site and dumped loads from the edge of the road into the depression. Piles of concrete debris were scattered throughout to the south of the depression. An unpaved access road oriented east-west extends from the undeveloped City of Moraine Road Allowance (the unnumbered parcel between Parcels 4610/3207 and 5176/5177) through the center of the Site. Portions of the Site are within the 100-year floodway[4], including the majority of the Site to the south of the Valley Asphalt property. Historic accounts from the landfill operator indicate that portions of the Site have flooded. The extent of flooding is not known; however, a 1959 aerial photo shows the entire extent of Site flooding during one event.

The Site has a fence around the majority of the central 25 acres (Parcel 5177) while separate fencing encompasses most of the northern and southern parcels that are within the Site boundary. The southern and western portions of the Quarry Pond are not fenced and there is not a fence between Valley Asphalt and the MCD floodway/recreational trail.

2.3 LAND USE

A summary of the local land use in the vicinity of the Site was obtained by reviewing the 1991 Dayton South, Ohio 7.5 minute United States Geologic Service (USGS) topographic quadrangle map and was updated based on visual observations made during the Site inspections conducted by CRA, in November 2005 and September 2006. Local land uses were verified in part through visits to the Site and surrounding areas. Local land use in the one square mile encompassing the Site consists of a mixture of residential, commercial, industrial, recreational, and transportation uses.

---

3 Historically used to incinerate refuse transported to the Site, see the OU1 RI Report for more complete details. See also Section 2.4 below

4 MCD defines floodway as the channel of a river or watercourse and the adjacent land areas that have been reserved in order to pass a specified flood discharge. The floodway is an extremely hazardous area during flood events, and is usually characterized by any of the following: moderate to high velocity flood waters, high potential for debris and projectile impacts, and moderate to high erosion forces.

Residential properties exist more than 1,500 feet (ft) north of the Site beyond the opposite bank of the GMR. A small trailer park is located 200 ft east-southeast of the Site across Dryden Road. Seven residences bound the Site to the southeast along East River Road. Commercial and industrial properties bound the Site to the east and south, including a maintenance facility owned by Dayton Power and Light (DP&L). Additional commercial and industrial properties are located on the opposite bank of the GMR to the northeast, north, northwest, west, and southwest. The Montgomery County Sewage Disposal facility is located along the opposite bank of the GMR to the southwest of the Site. Small and large cemeteries are located beyond the opposite bank of the GMR, to the northwest, and beyond I-75 to the east-southeast. Mineral extraction has occurred on properties beyond I-75 to the southeast.

Recreational and open space land uses occur along the banks of the GMR, which meanders northeast, north, northwest, west, and southwest of the Site. A hiking and biking trail is present on the north and west Site boundaries. A golf course is located west of the Site beyond the opposite bank of the GMR. Interstate Highway I-75 is present northeast, east, and south of the Site. Railroads are east and west of the Site and various roadways are present surrounding the Site.

With the exception of Parcel 3274 and the portion of the southern half of Parcel 3275 that is included within the definition of the Site, the entire Site is zoned 'M-2 General Industrial'. Parcels 3274 and 3275 are owned by MCD. Parcel 3274 and the southern half of Parcel 3275 are zoned 'C- Conservation'. Active businesses are present on Parcels 3252, 3753, 4423, 4610, 5054, 5171, 5172, 5173, 5174, 5175, 5176, and the northern portion of 5177.

Properties located adjacent to the Site, including the MCD property between the Site and GMR (except the southern half of Parcel 3275, which is zoned 'C-Conservation') and the properties located between the Site and East River Road, are also zoned 'M-2 General Industrial'. Properties located between the Site and East River Road, zoned 'M-2 General Industrial', include a mix of residential dwellings and commercial operations. The residential dwelling on Parcel 3253 backs up to an automotive repair shop. All of the other residential dwellings back on to an auto salvage yard, two Parcels of which are within the Site boundary (Parcel 3753 and Parcel 4423).

Properties located to the east of the Site, on the east side of Dryden Road, are zoned "M-2 General Industrial", while properties southeast of East River Road and west of Dryden Road are zoned "M-1 Light Industrial". A residential trailer park is located across Dryden Road, and south of the DP&L maintenance facility and is zoned "M-2 General Industrial". Other than these residences, properties located to the south and to the east

of the Site are used for warehousing, manufacturing, equipment maintenance and repair, commercial purposes, and fuel dispensing.

The property to the south of the Site, Parcel 3264, is located adjacent and to the south of Parcel 3274. Parcel 3264 is divided into three sections. The two portions of Parcel 3264 that are immediately adjacent to Parcel 3274, which are owned by the Montgomery Board of County Commissioners and zoned "C-Conservation", are used for a sewer lift station and a sewer right-of-way. The third portion of Parcel 3264, approximately 19 acres in area, is owned by the City of Moraine. In August 2006, the City of Moraine approved a zoning change for the 19-acre portion of Parcel 3264 from "C-Conservation" to "M-2 General Industrial District", under Moraine Ordinance 1640-06.

2.4 SITE HISTORY

The Site operated as a landfill from the early 1940's until 1996. Information on the Site history is contained in USEPA, Ohio EPA, and MCHD files for the Site, and on available historical aerial photographs and topographic maps (collectively referred to as "file materials"). A comprehensive Site history is presented in the OU1 RI Report (CRA, April 2010). An approximate timeline of the Site history is presented below.

- In 1936, Cyril Grillot and Horace Boesch acquired interests in portions of the approximately 40-acre central portion of the Site (Parcel 5171, 5172, 5173, 5174, 5175, 5176, and 5177 on Figure 2.1).
- In 1940, Alcine Grillot (Cyril Grillot's brother) began a landfill operation at the Site.
- In 1969, the MCHD first licensed the Site as a solid waste disposal facility.
- In 1970, Alcine Grillot formed Moraine Recycling, Inc. and developed and constructed an ACD along the west side of the Site although it is unclear whether the ACD operated for any length of time as it was determined to be inoperable by 1971.
- In 1974, the Ohio EPA took over the authority for annual license, however the licenses continued to be issued by and overseen by MCHD on behalf of Ohio EPA.
- The license issued by Ohio EPA in 1976 allowed the Site to accept only dry commercial, industrial, and salvageable wastes and wood for burning.
- The last license that was granted by the Ohio EPA was in 1986 and limited materials for disposal to construction and demolition debris.
- In 1990, the South Dayton Dump stopped accepting and disposing of fly ash at the Site.
- In early 1996 the Site closed.

2.5 PHYSIOGRAPHY

The Site is located in the northwest portion of the City of Moraine in Montgomery County. The topography of the County is generally flat. Lands within the County can be characterized as broad, nearly level to gently rolling till plains. The Site itself is located on a relatively flat parcel which has experienced considerable grading and filling associated with prior gravel mining and landfill activities. Land use in Montgomery County is a mixture of urban and suburban development and agriculture, with corn, soybeans, and wheat being the most common crops.

2.5.1 TOPOGRAPHY

The topography of the Site is variable, with a depression area in the west-central portion of the Parcel 5177, several mounded areas of fill and a ravine along the south-central part of the Parcel 5177, and a low-lying area along the entire southern portion of the Site. Portions of the Site are within the 100-year floodway, including the majority of the Site south of the Valley Asphalt property. The topography of the area that was formerly used for auto salvage north of the ACD (Parcel 5177) as well as the area currently utilized by Jim City Salvage east of the Quarry Pond (Parcels 3753 and 4423) were observed to be fairly level. The topography of the central portion of the Site (Parcel 5177) is uneven, with significant mounding in some areas, depressions in others, and slopes indicative of waste filling boundaries.

A heavily vegetated man-made embankment is present along the central (Parcel 5177) portion of the Site, and extends past the northern and western boundary of Parcel 5054, along the GMR.

2.5.2 STORM WATER DRAINAGE PATTERNS

CRA estimated surface runoff drainage patterns on and adjacent to the Site based on reviewing the 2005 topographic map and confirmed the flow patterns using the 2008 topographic map. The Valley Asphalt property (Parcel 5054) is a relatively flat plateau and has drainage in all directions away from the property. Drainage from the area where the Valley Asphalt office and Quonset hut are located is towards the southeast, onto Parcel 5171 and then into the gutter along the west side of Dryden Road. Drainage from the parcels located along Dryden Road (Parcels 5172, 5173, and 5174) is partially

split – the building fronts drain eastwards toward Dryden Road, while the rear (west), drains towards the central portion of the Site (Parcel 5177). Surface drainage in the central portion of the Site (Parcel 5177) is towards the Large Pond, with the exception of a limited portion along the western embankment that drains west on Parcels 3058 and 3278 and the portion of the north embankment of the Quarry Pond and ravine where drainage is southwards into the Quarry Pond. The presence of a dry ravine in the southeast corner of the central portion of the Site was noted during the 2008 investigative activities. The ravine drainage feature appears to have been created through partial fill placement from the adjacent eastern and southern embankments of the central depression. The ravine was filled with debris. CRA never observed the presence of water in the ravine drainage feature. Surface drainage from the embankment along the west edge of the Quarry Pond is to the west to Parcel 3275 and beyond.

Surface drainage in the southern part of the Site is divided, with a crest approximately 200 ft west of and parallel to East River Road, with drainage east of the divide going towards East River Road and then southwest along the road. Drainage west of the divide (from Parcels 3753, 4610, 5178, 3274, and 4423) flows towards the Quarry Pond. Surface drainage from the Quarry Pond does not freely or directly flow to the GMR.

Federally designated wetlands are located in the vicinity of the Quarry Pond and Large Pond (see Section 2.5.5 below).

2.5.3 PONDS

Surface water bodies at and in the vicinity of the Site include two intermittent ponds (Large Pond and Small Pond) located on-Site, the GMR to the west and north of the Site, and the former water-filled sand and gravel pit (Quarry Pond) located along the south end of the Site.

The Large Pond is located approximately 375 ft north of the Quarry Pond (see Figure 1.2). The Small Pond is located approximately 350 ft northeast of the Quarry Pond and approximately 275 ft southeast of the Large Pond. These two ponds were apparently connected and covered a larger area as described by Ohio EPA (1996) during Site visits in August 1995 and May 1996, and at the time of the aerial photometry survey in April 2008, each time following a period of extended rain. At various times, the Large Pond contained water while the Small Pond was dry (e.g., June, August, and September 1998, June 1999, at the time of CRA's inspection in November 2005, and during CRA monthly groundwater elevation rounds completed in September, and

December 2008, July, August, September, October, November, and December 2009). The Large Pond was dry at various times (e.g., October, November, December 1998, during CRA monthly groundwater elevation rounds completed in October and November 2008). The Payne Firm, Inc. (PFI) reported that the two ponds appear to be recharged by the shallow groundwater beneath the Site while "water is lost from the ponds through evapotranspiration and through infiltration to the underlying aquifer."

2.5.4 GREAT MIAMI RIVER (GMR)

The Ohio EPA 1996 STEP Report (Page 28) states:

> "*(t)he Ohio Water Quality Standards (OAC 3745-1-21) designate the Great Miami River as a Warm Water Habitat. The river is also designated as an agricultural and industrial water supply, as well as a primary contact recreation water body.*"

The 2005 FEMA FIRM indicates that about 60 percent of the Site, including the Quarry Pond, is located either in the floodway[5] or in the flood plain[6] of the 100-year flood of the GMR. The grassy area between the embankment and the shoreline is part of the floodway as defined by FEMA (E&E, 1991).

2.5.5 WETLANDS

There are several depressions within the Site boundary that may potentially be classified as wetlands. Wetlands are defined by plant species that are adapted to wet conditions (hydrophytes), hydric soil, and hydrologic regime. A wetland survey will identify the presence and extent of any jurisdictional wetlands on the Site.

The 1995 FSIP report states that Department of Interior's National Wetlands Inventory (NWI) classifies the 10- to 15-acre Quarry Pond (USGS 1981) as a palustrine, unconsolidated-bottom, intermittently exposed excavated wetland and the Large Pond (less than one acre) as palustrine, scrub-shrub, broad-leaved deciduous, seasonally

---

5 MCD defines floodway to be the channel of a river or watercourse and the adjacent land areas that have been reserved in order to pass a specified flood discharge. The floodway is usually characterized by any of the following: moderate to high velocity flood water, high potential for debris and projectile impacts, and moderate to high erosion forces.

6 MCD defines flood plain to be a strip of relatively flat and normally dry land alongside a stream, river, or lake that is covered by water during a flood.

flooded and excavated wetland. The 1995 FSIP also indicates that no obvious wetland vegetation, such as cattails or willows, was observed in the Large Pond during the 1994 Site reconnaissance.

PFI conducted a Site visit to the South Dayton Landfill and the Montgomery County Natural Resources Conservation Service (NRCS) on July 27, 2000. PFI reviewed the NWI map and concluded that it showed a palustrine scrub-scrub, broad-leaved, deciduous, seasonal, excavated wetland (PSS1Cx) at the Site. PFI noted that the wetland is a federally designated wetland that is in the vicinity of the Large Pond on Site.

PFI referred to the wetland area as an area of depression that is approximately 200 ft long by 70 ft wide, for a total area of approximately 0.3 acres.

PFI reviewed the FEMA Floodplain Map for Moraine, Ohio and concluded that the Site was within the 100-year floodplain. Less than 50 percent of the depression contained standing water to a depth of approximately twelve inches. PFI indicated that the standing water levels are related to the elevation of the GMR, which is approximately 400 ft to the west.

PFI observed the following during the Site visit: wetland plant species (i.e., hydrophytes), sycamore, cottonwood, box elder and black willow, reed canary grass, water plantain, and poison ivy. The soil in the Large Pond area was a dark black sand, which can be indicative of wetland conditions. However, PFI concluded that the dark color was probably an artifact of the burned foundry sand deposited on-Site.

PFI concluded that the depression at the Site has two of the three necessary wetland criteria, which are hydrology and vegetation. PFI stated that the soil wetland criterion was not met at the Site. PFI stated that the Large Pond might not be classified as a wetland due to the absence of hydric soil. However, PFI also stated that gravel pit (Gp) is the dominant soil type on the Site. If this is the case in the area of the Large Pond, then soil would not be a parameter considered in identifying or delineating the extent of jurisdictional wetlands, as it would represent an atypical situation.

2.5.6 TERRESTRIAL HABITATS

Terrestrial habitats at the Site were preliminarily identified based on field observations and have been classified according to Eastern Forests (Kricher and Morrison, 1988). The major habitat types identified on the Site include:

- Mowed Field
- Perennial Herbaceous Woody Plant Community
- Disturbed Early Successional Northern Riverine Forest Community

A brief discussion of each is provided below.

Mowed Field

The mowed field habitat consists of grasses and various forbs that are managed through periodic cutting.

Perennial Herbaceous Woody Plant Community

Old field areas that range in age from 10 to 60 years post-abandonment are usually dominated by Perennial Herbaceous Woody Plant Communities. An old field is defined as an abandoned field or disturbed terrestrial habitat that has a well-developed soil base. Old field succession begins soon after a field is abandoned or a disturbed terrestrial habitat is left alone.

In a Perennial Herbaceous Woody Plant Community, forbs and grasses are much less obvious compared to younger communities. Clumps of trees and shrubs shade the ground. Large patches of trees and shrubs are interrupted by areas of grass. This habitat is very patchy in appearance. Very old fields begin to look like woodlands, with dense clumps of slender trees (Kricher and Morrison, 1988).

Disturbed Early Successional Northern Riverine Forest Community

Northern Riverine Forest Communities are those that occupy moist Sites along rivers and floodplains. Spring flooding is an annual occurrence in this type of community. Herbaceous cover is generally minimal (Kricher and Morrison, 1988). This habitat, like the other habitats on the Site, has been highly disturbed in the past.

The vegetation in this community is composed of a few large, old trees and an abundance of dense, young trees and shrubs. This habitat provides bank stabilization and likely helps to prevent erosion of Site soil into the GMR.

2.5.6.1 SPECIES OF POTENTIAL CONCERN

The Ohio Department of Natural Resources (ODNR) was contacted to determine whether there were any known rare, threatened, or endangered (T&E) species on or near the Site that might be affected by Site-related contaminants. According to the agencies no Federal T&E species occur on or near the Site. In terms of the State of Ohio, a state-listed threatened plant (Carolina whitlow grass) and a state-listed endangered plant (Plains Muhlenbergia) were reported within one-mile of the Site. However, these T&E plants are not likely to be present at the Site because of the disturbed habitat.

There is also a bank swallow colony about 0.7 miles to the west-southwest of the Site. Although not a federal or state listed species of concern in Ohio, bank swallows are species of concern in several other states (e.g., California, Kentucky). Bank swallows from the nearby colony are unlikely to face exposure from chemicals at the Site because swallows generally forage closer to their nesting sites - about 1/10th of a mile or less (Garrison, 1998) - than the distance to the Quarry Pond. Moreover, they prefer to feed over non-forest (river, stream, meadows, fields, pastures, bogs). Most of the Site, except possibly for the Quarry Pond, is not a suitable foraging area. Nonetheless, this ecological risk assessment will consider risks to tree swallows consuming flying insects emerging from the Quarry Pond. The risk evaluation for tree swallows is applicable to the bank swallow as well.

Recreational Use

The 1995 FSIP states that,

> *(a)n estimated 5,000 lbs. of fish is caught and consumed annually within 15 miles downstream of the Site. Also, a fishing advisory for bottom-feeding fish exists because of the presence of PCB contamination in the GMR (PRC 1994a). Additionally, between 1 and 2 linear miles of wetland habitat exists along the GMR within 15 miles of the Site (NWI 1988).*

In 2010, Ohio EPA issued advisories on consumption of fish from the GMR. The fish included in the advisory includes common carp, flathead catfish, all suckers, channel catfish, white bass, and small mouth bass. The advisory recommends limiting meals of fish from the GMR to one meal per month, with the exception of suckers, which should not be eaten. Ohio EPA issued the advisories as fish taken from rivers, streams, lakes, and reservoirs throughout Ohio often have small amounts of chemical contaminants. The fish advisory is in place due to PCB and mercury contaminants in GMR fish. Data collected from lakes and rivers in Ohio show that a statewide advisory of one meal per

week of sport-caught fish is appropriate. The fish advisory for the GMR extends from well upstream of the Site to well downstream of the Site and does not result from Site conditions. No further information has been found regarding the amount of fish caught and consumed annually in the vicinity of the Site.

The 1995 FSIP also indicates that during the 1994 Site reconnaissance, Alcine Grillot stated that the Quarry Pond is occasionally used for recreational activities, including fishing.

During the September 2006 Site inspection, signs were observed at the perimeter of the Quarry Pond that indicated "No Trespassing" and "No Fishing". In 2008, the Respondents posted signs along the perimeter of the Site identifying it as a Superfund Site, restricting access to authorized personnel only, and providing contact information for the EPA Community Involvement Coordinator (1-800-621-8431 ext 69506; www.epa.gov/region5/sites/sdayton).

2.6 SAMPLING HISTORY

This section summarizes the investigations completed at the Site as reported in the OU1 RI Report. The data from these investigations form the basis of the BRA.

CRA Investigations

Test Pit / Test Trench Investigation	September 23, 2008 to October 8, 2008
Groundwater sampling of existing MWs	September 4 - 12, 2008
Vertical Aquifer Sampling (VAS)	October 28, 2008 to January 11, 2009
Vertical Aquifer Sampling (follow-up)	June 2 - 10, 2009
Groundwater sampling (existing & newly installed MWs)	July 21 - 28, 2009
Landfill Gas/Soil Vapor Probe sampling	September 4 - 29, 2009
DP&L Vertical Aquifer Sampling	November 4 - 23, 2009
Groundwater sampling (existing & newly installed MWs)	December 22, 2009 - January 25, 2010

Historic Investigations

EEI Screening Site Inspection (surface and subsurface soil)	1991
PSARA monitoring well installation (& soil borings SD-001 to SD-007)	1996
Ohio EPA Site Team Evaluation Prioritization (STEP) (soil, sediment, groundwater)	1996
PFI soil borings (13), monitoring well installation (MW-201 - 204,	

MW-206 - 210, and MW-212), piezometer P-211	1998 - 1999
PFI installation of surface water elevation gauges (ponds)	May 1998
PFI surface water and sediment sampling (Quarry Pond)	Apr. 1999, May 2000
PFI ten rounds of groundwater samples	1996 - 2005

Investigative locations for soil gas, soil, groundwater, and surface water/sediment are shown on Figures 2.1 through 2.4, respectively. The locations of the historic samples shown on Figures 2.1 through 2.4 are based on scanned copies of the report. Survey data for these sample locations are not available. An analytical database is presented in Appendix A.

2.7 SITE GEOLOGY/HYDROGEOLOGY

2.7.1 GEOLOGY

The following sub-section presents a description of the regional geology of the Dayton area as well as a description of the subsurface geology beneath the Site. CRA developed this sub-section from CRA's field observations, historical stratigraphic logs, and publications describing the regional geology (and hydrogeology). Based on CRA's field observations and a review of historical stratigraphic logs, the soil conditions at the Site are well characterized.

The Dayton area is located within the buried pre-glacial valley system that underlies the present day GMR and its tributaries in southwestern Ohio. This pre-glacial valley system is known as the Miami Valley Aquifer System (Ritzi *et al.*, 1994; Ritzi *et al.*, 1995; Dominic *et al.*, 1996, Ritzi *et al.*, 1996).

Bedrock

The regional bedrock geology consists mainly of limestone and shale. Prior to glaciation, a mature and well-integrated drainage system had incised deep valleys into the bedrock. In the Dayton area, the paleo-drainage system is approximately 300 ft deep and 2.5 miles wide (Ritzi *et al.*, 1995). Norris and Spieker (1966) created a contour map of the top of the bedrock surface. These contours indicate that the bedrock surface elevation in the upland areas is greater than 800 ft AMSL - 1988 National Geodetic Vertical Datum. The bedrock surface elevation in the vicinity of the Site (which is located near the axis of the bedrock valley) ranges from about 500 to 550 ft AMSL.

The uppermost bedrock unit in the lowland area is the Ordovician-aged Richmond Group. The Richmond Group consists of inter-bedded shale and limestone and is approximately 500 ft thick. The Brassfield Limestone, a Silurian-age limestone that is approximately 30 ft thick, caps the Richmond Group in the upland areas.

CRA only encountered bedrock at two locations in the vicinity of the Site, specifically, VAS-29 and VAS-30, beneath the DP&L property, at depths of 190 ft bgs and 189 ft bgs, respectively. The weathered bedrock was composed of sand-, gravel-, and cobble-sized pieces of limestone in a clay-size limey matrix, which was very hard, gray, damp, and fissile.

Overburden

The regional overburden geology of the Dayton area consists of glacial tills, and glaciofluvial sand and gravel deposits. Norris and Spieker (1966) defined the overburden units, based on general character and relative position to be (from top to bottom):

- Ground Moraine (glacial till) – composed of silt, gravel, and clay; found primarily on the uplands areas.
- Upper Aquifer Zone– the saturated glaciofluvial sand and gravel zone located above a major till-rich zone. This zone is also referred to as the Upper Sand and Gravel or as hydrogeologic outwash unit 1 or as the Upper Buried Valley Aquifer.
- Till-Rich Zone – composed of discontinuous fine-grained glacial till and other fine-grained materials with substantial components of sand and gravel.
- Lower Aquifer Zone – the glaciofluvial sand and gravel zone located beneath the Till-Rich Zone. This zone is also called the Lower Sand and Gravel, hydrogeological outwash unit 2 or as the Lower Buried Valley Aquifer.

The subsurface geology identified by CRA consists of fill underlain by glacial tills, and glaciofluvial sand and gravel deposits.

The fill unit primarily consists of silt, sand, and gravel mixtures with a thickness that ranges from less than 1 foot to greater than 40 ft. Over portions of the Site, the silt, sand, and gravel unit is interspersed with waste materials including glass, brick, fly ash, and foundry-type sand.

Two distinct discontinuous till units are present in the subsurface. The upper till unit primarily consists of clay, clay mixtures, silt or silty sands with a thickness that ranges

from 1 foot to greater than 20 ft. Where present the top of the uppermost till unit is typically encountered between elevations of 705 and 696 ft AMSL. The lower till unit, which is typically present between 640 and 675 ft AMSL, consists primarily of lenses or sheets of silt or silty sand mixtures with a thickness that ranges from less than 1 ft to 10 ft. The upper and lower till units are discontinuous in nature.

2.7.2 HYDROGEOLOGY

Hydrostratigraphy

The regional groundwater resources of the Dayton area were originally described in Norris and Speaker (1966). They identified three principal hydrogeologic units in the Dayton area, as follows:

- Upper Aquifer Zone - the upper portion of the saturated glacio-fluvial sand and gravel facies
- Till-Rich Zone - a zone of discontinuous low permeability till facies interspersed with sand and gravel facies, which may act as an aquitard unit
- Lower Aquifer Zone - consisting of the lower portion of the upper saturated glacio-fluvial sand and gravel facies

The RI Work Plan refers to the subdivisions of the aquifer as follows: Upper Aquifer Zone; followed by the Till-Rich Zone; followed by the Lower Aquifer Zone.

The distribution of fine-grained material is a key element in predicting groundwater flow and contaminant transport. In addition, the Till-Rich Zone may not always behave as an aquitard due to the substantial amounts of aquifer facies materials (Ritzi *et al.*, 1995).

Hydraulic Conductivity

The regional hydraulic conductivity of the Upper and Lower Aquifer Zones is on the order of 100 to 300 ft/day (Norris and Spieker, 1966). In August 2009, CRA completed single well response tests (SWRTs) on twenty monitoring wells to determine the hydraulic conductivity of the overburden beneath the Site. CRA completed a "*falling head test*" and a "*rising head test*" in each of the monitoring wells. The results of the SWRTs in the overburden monitoring wells indicated a hydraulic conductivity that

ranged between 1.57×10^{-4} feet/second (ft/s) (13.6 ft/day) in MW-101A and 1.25×10^{-2} ft/s (1,080 ft/day) in MW-209A.

Groundwater Flow Direction and Horizontal Gradients

Regional Groundwater Flow Direction and Horizontal Gradients

Groundwater flows from the west-northwest and the east-southeast toward the Site and then continues across the Site in a generally south-southwest direction, approximately along the axis of the buried valley. The groundwater level elevation in the vicinity of the Site is between 700 and 725 ft AMSL (likely closer to 710 ft AMSL at the Site). The horizontal hydraulic gradient along the axis of the buried valley in the vicinity of the Site is about approximately 0.007 ft/ft. The horizontal hydraulic gradients toward the Site from the west-northwest and east-southeast are about approximately 0.015 ft/ft and 0.028 ft/ft, respectively (Dumouchelle, 1998).

Site-Specific Groundwater Flow Direction and Horizontal Hydraulic Gradients

Groundwater levels have been measured at the Site since 1998. Between 1998 and 2005, groundwater level measurements collected by others ranged from 12.42 to 27.37 ft bgs, with an average depth of 21.30 ft bgs in on-Site monitoring wells MW101A, MW202, MW203, MW208, MW210, and MW212. CRA measured groundwater elevations in on-Site monitoring wells MW101A, MW202, MW203, MW208, MW210, MW212, MW214, MW215, and MW217 on a monthly basis from July 2008 onwards. The depth to groundwater between July 2008 and October 2009 ranged between 11.46 to 28.05 ft bgs, and the average depth to groundwater was 19.31 ft bgs. The historical groundwater elevation measurements are consistent with CRA's recent measurements. Therefore groundwater beneath the Site is present at a depth greater than 15 ft bgs.

On January 13, 2010, CRA completed a groundwater elevation monitoring event in which groundwater elevations were collected from on and off-Site monitoring wells. Based on the groundwater elevations collected during this event, the static groundwater elevation in the overburden is located between 708.50 and 709.82 ft AMSL. CRA used the groundwater elevation data to create groundwater elevation contours and to determine the horizontal hydraulic gradients. The groundwater elevation data suggest groundwater flow in the overburden across the Site is predominantly west towards the GMR.

The horizontal hydraulic gradient beneath the Site is relatively flat but is variable, as indicated by the variable spacing of the groundwater elevation contours. The horizontal

hydraulic gradient derived from the contours ranges between 0.00001 to 0.0022 ft/ft for the Upper Aquifer Zone and between 0.0001 to 0.0006 ft/ft for the Lower Aquifer Zone.

Using the lower end of the range of hydraulic conductivity for the Upper Aquifer Zone (MW-101A) and the geometric mean of the Upper Aquifer Zone gradient values provided in this area, CRA calculated the groundwater velocity for the Upper Aquifer Zone in the vicinity of MW-101A as follows:

$$v = Ki/n$$

where:

v = groundwater velocity (ft/day)

K = hydraulic conductivity $=1.57\times10^{-4}$ ft/s or 13.56 ft/day

i = horizontal hydraulic gradient = 0.001

n = porosity = 0.35 (assumed)

Then v=Ki/n= (13.56 ft/day)(0.001)/0.35 = 0.039 ft/day.

If the higher end of the range of values for hydraulic gradient and hydraulic conductivity for the Upper Aquifer Zone (MW-217) is used, then the groundwater velocity for the Upper Aquifer Zone in the vicinity of MW-217 is as follows:

K = hydraulic conductivity $=9.54\times10^{-3}$ ft/s or 824.26 ft/day

i = horizontal hydraulic gradient = 0.00016

n = porosity = 0.35 (assumed)

Then v = Ki/n = (824.26 ft/day)(0.00016)/0.35 = 0.377 ft/day.

Therefore, based on the available information, the groundwater velocities in the Upper Aquifer Zone at the Site range from 0.039 ft/day (14 ft/year) to 0.377 ft/day (138 ft/year).

Similarly, using the lower end of the range of hydraulic conductivities for the Lower Aquifer Zone (MW-212) and the geometric mean of the Lower Aquifer Zone gradient values in this area, CRA calculated the groundwater velocity for the Upper Aquifer Zone in the vicinity of MW-212 as follows:

$$v = Ki/n$$

where:

v = groundwater velocity (ft/day)

K = hydraulic conductivity $=3.05\times10^{-3}$ ft/s or 263.5 ft/day

i = horizontal hydraulic gradient = 0.00021

n = porosity = 0.35 (assumed)

Then v = Ki/n = (263.5 ft/day)(0.00021)/0.35 = 0.158 ft/day.

If the higher end of the range of values for hydraulic gradient and hydraulic conductivity for the Upper Aquifer Zone (MW-209A) is used, then the groundwater velocity for the Upper Aquifer Zone in the vicinity of MW-209A is as follows:

K = hydraulic conductivity $=1.25\times10^{-2}$ ft/s or 1080 ft/day

i = horizontal hydraulic gradient = 0.00027

n = porosity = 0.35 (assumed)

Then v=Ki/n= (1080 ft/day)(0.00027)/0.35 = 0.833 ft/day.

Therefore, based on the available information, the groundwater velocities in the Lower Aquifer Zone at the Site range from 0.158 ft/day (58 ft/year) to 0.833 ft/day (304 ft/year).

Contaminant migration rates are lower than these groundwater rates due to attenuation mechanisms such as adsorption, dispersion, volatilization, and degradation.

CRA calculated the vertical hydraulic gradient across the Site using the groundwater elevation data for three shallow and deep monitoring well clusters (MW209/MW209A, MW215A/B, and MW218A/B). Based on the groundwater elevation data, there is a downward hydraulic gradient in the vicinity of MW-215A/B that ranges between -0.0026 and -0.0133 ft/ft. The direction of the vertical hydraulic gradient in the other two monitoring well clusters changed during the monitoring periods. The magnitude of the vertical hydraulic gradient ranged from –0.029 to 0.006 ft/ft.

Potable Wells

CRA initiated a public records search to identify all potable water wells in the vicinity of the Site.

There are two known water supply wells on-Site, both located on the Valley Asphalt property. CRA obtained well logs for the two Valley Asphalt wells from Ohio Department of Natural Resources. The well logs indicate that the first well was installed in 1956 to a depth of 74 ft, and the second well was installed in 1969 to a depth of 10 ft. The wells are located adjacent to the bulk tanker water loading station. Based on a March 22, 1996 telephone memorandum between Valley Asphalt employee John Eichstadt and Ohio EPA employee Brian Marlatt, the 1956 well was originally used for plant process washing, but is now "tapped-off" for dust control and sanitary uses (commode). Based on electronic mail correspondence between Ohio EPA – Division of Drinking and Ground Waters and USEPA, dated February 1, 2006, Ohio EPA – Division of Drinking and Ground Waters inspected Valley Asphalt in January 2006 and confirmed that the well is not used as a potable water supply. During CRA's September 5, 2006 Site inspection, Mr. Crago of Valley Asphalt identified the two water wells located on the property. One of the wells provides water to the office, reportedly for non-potable uses, while the second well provides water to the bulk tanker loading station and the batch plant operation.

The Site is located in a secondary wellhead protection area. Well records indicate there are two residential wells and five commercial/industrial wells located within 500 to 1,500 ft of the general downgradient direction of the Site. In October 2009, USEPA confirmed Well 966158 at 2447 East River Road, approximately 500 ft south of the Site, was being used as a potable water supply. Well 966158, owned by Miller Valentine, was installed in 2005 to a depth of 98 ft. The well screen of 966158 is set from 68 to 98 ft, in large gravels and sand.

2.7.3 HYDROLOGY

The Site is within the drainage area of the GMR, which generally flows in a southerly direction. Gauging stations are located 3.5 miles upstream of the Site in the City of Dayton (USGS Station 03270500), and 9.9 miles downstream of the Site at Miamisburg (USGS Station 03271500). The City of Dayton wastewater treatment plant (WWTP) is situated on the west (opposite) bank of the river to the west of the Site and has a local MCD gauging station associated with it.

Stream flow data for the GMR between Dayton and Miamisburg varies widely. Stream flow at Dayton between July 1 and September 30, 1993, declined from 24,000 cubic feet per second (ft^3/s) to less than 1,000 ft^3/s. The gauging station at Miamisburg reported similar stream flows for that time period. Flow measurements recorded between September 8 and 9, 1993 during relatively low flow conditions were 630 ft^3/s at Dayton, 680 ft^3/s at the Dayton WWTP and 738 ft^3/s at Miamisburg. However, when the additional flows from tributaries, storm sewer outfalls and waste water treatment plants were considered, the river flow data indicated a net loss of 9.03 ft^3/s for the GMR between the Dayton gauging station and the Dayton WWTP and a net loss of 55.0 ft^3/s between the Dayton WWTP and Miamisburg (Yost, 1995).

The closest monitoring location found in the Yost, 1995 report is at the Dayton WWTP. The water level at this location was 709.43 ft AMSL on September 9, 2003. Further investigation using the USGS data from Gauge Station 03270500 Great Miami River at Dayton showed that September 15, 1999 represents the current historical low flow. Comparing the USGS gauge levels at this location on September 8, 1993 and September 15, 1999, the difference was 3.54 ft. CRA therefore concluded that the September 15, 1999 water level was approximately 705.89 ft AMSL at the WWTP.

Yost (1995) used piezometers and seepage meters to determine the vertical gradient between the GMR and shallow groundwater and the streambed hydraulic conductivity, respectively, in late October and early November 1993 (Yost, 1995). One seepage meter/piezometer was installed to the north of the Site. The vertical gradient at this location was 0.01 ft/ft downward during the October and November 2003 investigation. The hydraulic conductivity of the streambed at this location over this period of time was calculated to be 9.6×10^{-6} ft per second (307 ft per day). While the seepage meter/piezometer data cited in Yost, 1995 for the location adjacent to the Site did show a slight downward vertical gradient (0.01 ft/ft), not all locations along the Great Miami River investigated by Yost had downward vertical gradients. It is, therefore, not known whether the river is losing along the entire reach that borders the Site. Additionally, since the study represents one point in time, it is also not known whether the GMR is always losing at the studied location.

3.0 BASELINE HUMAN HEALTH RISK ASSESSMENT (HHRA)

CRA has prepared this HHRA for the Site. The HHRA quantifies the cumulative risk and hazard index for each human receptor of concern exposed to Site media.

CRA completed the HHRA in accordance with the following USEPA guidance:

- USEPA Risk Assessment Guidance for Superfund (RAGS): Volume 1 - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989 (USEPA, 1989a)
- USEPA RAGS: Volume 1 – Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors, Interim Final, OSWER Directive 9285.6-03, March 25, 1991 (USEPA, 1991a)
- USEPA RAGS: Volume 1 – Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals), Interim, EPA/540/R-92/003, December 1991 (USEPA, 1991b)
- USEPA Assessing Dermal Exposure from Soil, Region III Technical Guidance Manual Risk Assessment, EPA/903-K-95-003, December 1995 (USEPA, 1995a)
- USEPA Exposure Factors Handbook, EPA/600/P-95/002Fa, August 1997 (USEPA, 1997a)
- USEPA Region 4 Human Health Risk Assessment Bulletins – Supplement to RAGS, Section 4: Exposure Assessment, May 2000 (USEPA, 2000a)
- USEPA RAGS: Volume 1 – Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments), Final, Publication 9285.7-47, December 2001 (USEPA, 2001)
- USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December 2002 (USEPA, 2002)
- USEPA RAGS: Volume 1 – Human Health Evaluation Manual (Part E, Supplemental Guidance For Dermal Risk Assessment), Final, EPA/540/R/99/005, OSWER Directive 9285.7-02EP, PB99-963312, July 2004 (USEPA, 2004a)
- USEPA User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings, Office of Emergency and Remedial Response, February 22, 2004 (USEPA, 2004b)
- USEPA Child-Specific Exposure Factors Handbook, September 2008 (USEPA, 2008a)
- USEPA RAGS: Volume 1 – Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment, Final, EPA-540-R-070-002, OSWER 9285.7-82, January 2009 (USEPA, 2009a)

The HHRA is comprised of a hazard identification step, an exposure assessment step, a toxicity assessment step, a risk characterization step, and an uncertainty analysis. These HHRA steps are presented in the following sections.

3.1 HAZARD IDENTIFICATION

The hazard identification step of the HHRA involves developing the human health Conceptual Site Model (CSM) to identify the receptors at the Site that may be exposed to chemicals of potential concern (COPCs) present in soil gas, surface soil[7], subsurface soil, groundwater, surface water, and sediment. To develop the CSM, CRA determined potentially complete exposure pathways for human exposure to soil gas (includes soil vapor and landfill gas), soil, groundwater, surface water, and sediment with consideration of the characterization of the Site. This evaluation is presented in Section 3.2. The following sections describe the hazard identification step of the HHRA.

3.1.1 HHRA CONCEPTUAL SITE MODEL (CSM)

In order to evaluate the significance of the impacted media at the Site, the potential pathways by which individuals may come in contact with these media must be determined. The combination of factors (chemical source, media of concern, release mechanisms, and potential receptors) that could produce a complete exposure pathway and lead to human uptake of chemicals at the Site are assessed in what is defined as a CSM. CRA has identified the following human receptors for the Site:

- trespasser
- on- and off-Site industrial/commercial worker
- construction/utility worker
- off-Site resident (child/adult)

The HHRA CSM is summarized in Table B.1 of Appendix B. The CSM assumes the following potential human receptors may be exposed to Site media:

7 Surface soil is defined as soil present at a depth of less than two feet below ground surface. Subsurface soil is present at a depth of 2 feet below ground surface or more (Ohio EPA, 2009).

Soil Gas	*Surface Soil*	*Subsurface Soil*	*Groundwater*	*Surface Water*	*Sediment*
Trespasser	Trespasser	Construction/ Utility Worker	Off-Site Resident (Child and Adult)	Trespasser	Trespasser
On-Site Industrial/ Commercial Worker	On-Site Industrial/ Commercial Worker		Off-Site Industrial/ Commercial Worker	On-Site Industrial/ Commercial Worker	On-Site Industrial/ Commercial Worker
Construction/ Utility Worker	Construction/ Utility Worker			Construction/ Utility Worker	Construction /Utility Worker
Off-Site Resident (Child and Adult) (Future)					
Off-Site Industrial/ Commercial Worker (Future)					
Off-Site Recreational User (Future)					

As detailed in Section 1.0, The Streamlined OU1 FS will address on-Site soils and waste materials, soil vapor and landfill gas, and treatment options for shallow groundwater (i.e., nominally at an elevation above approximately 675 ft AMSL, or above the first till layer, whichever is encountered first) beneath the Site[8].

OU2 includes the following areas not contained by OU1:

- Landfill material, surface and subsurface soil, and hot spots outside the OU1 Area (e.g., the floodplain[9] area between the Site and the Great Miami River (GMR))
- Deeper groundwater [i.e., nominally at elevations below 675 feet above mean sea level (ft AMSL), above the elevation of the Till-Rich Zone] within and outside the OU1 Area
- Shallow groundwater outside the OU1 Area

8 The delineation of shallow groundwater is not absolute and where shallow OU1 groundwater contamination extends a short distance below 675 ft AMSL, the contamination below 675 ft AMSL would also be remediated where feasible and appropriate.

9 The MCD defines a floodplain as a strip of relatively flat and normally dry land alongside a stream, river or lake that is covered by water during a flood.

- Leachate outside the OU1 Area (e.g., the floodplain area between the Site and the GMR)
- Landfill gas and soil vapor outside the OU1 Area
- Surface water and sediment outside the OU1 Area (e.g., the floodplain area between the Site and the GMR)
- Air outside the OU1 Area

Existing off-Site groundwater and soil vapor contamination will be assessed as part of the OU2 RI/FS. The OU1 BRA includes an assessment of risks to off-Site receptors from on-Site shallow groundwater in order to identify risks posed by contaminant concentrations in shallow on-Site groundwater (i.e., OU1) that may be migrating off Site currently or may migrate off-Site in the future. Any such risks will need to be addressed as part of the remedial alternatives assessed in the FS.

3.1.2 RECEPTOR CHARACTERISTICS

Trespasser

The trespasser receptor would be an occasional trespasser aged 7 to 16 years who would gain access to the Site via trespassing. As the exposure frequency for an adolescent trespasser would be equal to or greater than an adult trespasser, only the adolescent trespasser, the more sensitive receptor, was evaluated within the HHRA. The trespasser is expected to be exposed to COPCs present in on-Site surface soil through direct contact (incidental ingestion, dermal contact, and inhalation of particulates/volatiles), on-Site soil gas through the inhalation of ambient air, on-Site sediment through direct contact (incidental ingestion and dermal contact), and on-Site surface water through direct contact (incidental ingestion, dermal contact, inhalation of volatiles).

Industrial/Commercial Worker

The on- and off-Site industrial/commercial worker would be an adult working primarily indoors (and possibly a limited amount outdoors) within an industrial/commercial building. During the limited outdoor activity, soil exposure will be limited to surface soil. The on-Site industrial/commercial workers are expected to be exposed to COPCs present in on-Site surface soil through direct contact (incidental ingestion, dermal contact, and inhalation of particulates/volatiles), on-Site soil gas through the inhalation of indoor air and ambient air, on-Site sediment through direct contact (incidental ingestion and dermal contact), and on-Site surface water through

direct contact (incidental ingestion, dermal contact, and inhalation of volatiles). CRA has assumed that the off-Site industrial/commercial workers would be exposed to COPCs present in on-Site shallow groundwater migrating off-Site through volatilization of the COPCs to soil vapor, migration of the soil vapor to indoor air and inhalation of indoor air by the off-Site industrial/commercial worker. As noted above, existing off-Site groundwater and soil vapor contamination will be assessed as part of the OU2 RI/FS. The OU1 BRA includes an assessment of risks to off-Site receptors from on-Site groundwater in order to identify risks posed by contaminant concentrations in shallow on-Site groundwater (i.e., OU1) that may be migrating off Site currently or may migrate off-Site in future. Although there is the potential for off-Site industrial/commercial workers to be exposed to on-Site soil gas through ambient air inhalation, it is expected that soil gas would be significantly diluted as it moves off Site in soil gas and especially when it migrates into ambient air and that the dilution would result in negligible exposure. As a result, ambient air inhalation exposure to on-Site soil gas by off-Site industrial/commercial workers was not quantitatively evaluated in the HHRA.

Construction/Utility Worker

Outdoor construction/utility worker activities may occur during future Site development. Construction/utility activities were assumed to involve ground intrusive activities, such as short-duration excavations or trenching for installation of foundations for above grade permanent structures and/or installation/maintenance of subsurface utilities. The construction/utility worker would be an adult that spends a reasonable amount of time at the Site within a limited period (1-year) during the construction and/or utility activities. Groundwater beneath the Site is present at an average depth greater than 15 ft bgs. As typical utility excavations are not greater than 15 ft bgs, it is unlikely that the construction/utility worker will come into contact with groundwater while performing ground intrusive activities at the Site. Therefore, direct contact exposure to groundwater was not evaluated further in the HHRA. The construction/utility worker could be exposed to COPCs in on-Site soil (surface and subsurface) through direct contact (incidental ingestion, dermal contact, and inhalation of particulates/volatiles), on-Site soil gas through the inhalation of ambient air, on-Site sediment through direct contact (incidental ingestion and dermal contact), and on-Site surface water through direct contact (incidental ingestion, dermal contact, and inhalation of volatiles) during excavation.

Off-Site Resident (Child and Adult)

The resident would be a child from 1 to 6 years of age and an adult from 7 to 31 years of age, consistent with USEPA (2004a). The resident would be an occupant of an off-Site

residential building exposed to on-Site groundwater migrating off-Site through inhalation of indoor air. In October 2009, USEPA confirmed Well 966158 on East River Road, approximately 500 ft south of the Site was being used as a potable water supply. Therefore, a potable groundwater exposure was quantitatively evaluated in the HHRA based on-Site shallow groundwater data. As noted above, existing off-Site groundwater and soil vapor contamination will be assessed as part of the OU2 RI/FS. The OU1 BRA includes an assessment of risks to off-Site receptors from on-Site groundwater in order to allow identify risks posed by contaminant concentrations in shallow on-Site groundwater (i.e., OU1) that may be migrating off Site currently or may migrate off-Site in future. Although there is the potential for off-Site residents to be exposed to on-Site soil gas through ambient air inhalation, CRA expects that soil gas would be significantly diluted as it migrates off-Site in soil gas or ambient air and that this dilution would result in negligible exposure. As a result, ambient air inhalation exposure to on-Site soil gas by off-Site residents was not quantitatively evaluated in the HHRA.

Recreational User (Child and Adult)

The recreational user would be a child from 1 to 6 years and an adult from 7 to 31 years that would potentially use the bike path along the GMR. The only potential exposure for the recreational user is from ambient air inhalation exposure to soil gas vapors originating on the Site. However, as it is expected that soil gas would be significantly diluted as it moves off-Site in soil gas or ambient air, which would result in negligible exposure, ambient air inhalation exposure to on-Site soil gas by off-Site recreational users was not quantitatively evaluated in the HHRA. Therefore, recreational users were not evaluated further in the HHRA.

3.1.3 SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPCs)

This section presents the process for establishing the COPCs for Site media. COPCs are chemicals related to the Site that pose the greatest potential public health risk. In general, detected chemicals are identified as COPCs based upon their concentrations and known toxicity characteristics.

CRA identified chemicals as a COPC if the maximum detected Site concentration was greater than applicable screening criteria identified for each medium. Chemicals that were detected but lack applicable screening criteria were also identified as COPCs. All essential nutrients, including calcium, magnesium, potassium, and sodium, were disregarded from further evaluation. All chemicals having a low detection frequency

(i.e., chemicals that were detected in fewer than 5 percent of the samples collected for a given medium) were not identified as COPCs for a given medium.

3.1.3.1 SCREENING CRITERIA

For each chemical reported in each medium, CRA compared the data to toxicity-based screening levels reported in USEPA's Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites (USEPA, 2009b). The toxicity-based screening levels are non Site-specific risk-based concentrations in environmental media (soil, air, water, and sediment) that are considered to be protective of humans, including sensitive groups, over a lifetime. CRA used the following specific toxicity-based screening levels for COPC selection:

Media	*Toxicity-Based Screening Level*
Soil Gas	RSLs – Residential Air
Surface Soil	RSLs – Residential Soil
Surface and Subsurface Soil	RSLs – Residential Soil
Groundwater	RSLs – Tap Water
Sediment	RSLs – Residential Soil
Surface Water	RSLs – Tap Water

The toxicity-based screening levels are chemical concentrations that correspond to fixed levels of risk [i.e., either a one-in-one million (1×10^{-6}) excess lifetime cancer risk or a non-carcinogenic hazard index (HI) of 1]. To account for multiple end points, CRA adjusted the non-carcinogenic toxicity-based screening concentrations by a factor of 10 (HI=0.1). CRA evaluated the chemical data for each medium to identify chemicals that were present at concentrations greater than the toxicity-based screening concentrations.

The soil gas data set consists of data collected from soil gas probes located at the Site. CRA analyzed the soil gas for VOCs.

The surface soil data set consists of all soil less than or equal to 2 ft bgs. Subsurface soil consists of all soil from greater than 2 ft bgs to a depth of 15 ft bgs (based on the maximum expected depth of exposure in an excavation). The sediment data set consists of the analytical results for sediment samples collected from the Quarry Pond. CRA and prior investigators analyzed the surface soil, subsurface soil and sediment samples for VOCs, SVOCs, BTEX, metals, PCBs, and pesticides.

Groundwater quality data were obtained from groundwater samples collected from shallow monitoring wells to assess groundwater quality in the Upper Aquifer Zone and the fill layers and from deep groundwater monitoring wells to assess groundwater quality in the Lower Aquifer Zone and the Till-Rich Zone at the Site. The groundwater samples were analyzed for TCL VOCs, SVOCs, PCBs, pesticides, and herbicides and TAL metals. As a conservative measure and to ensure that impacts within 100 ft bgs were assessed in accordance with vapor intrusion guidance, CRA compared the combined groundwater data from Upper and Lower Aquifer Zone wells to the toxicity-based screening concentrations to identify the COPCs. Additionally, as a conservative measure and to ensure that impacts within 100 ft bgs were assessed in accordance with vapor intrusion guidance, CRA combined data from the Upper and Lower Aquifer Zone wells to calculate exposure point concentrations that were used to calculate the risk and hazard associated with exposure to groundwater in the on- and off-Site exposure areas. The use of the deeper groundwater data for samples collected from the Lower Aquifer Zone is a conservative measure as the Lower Aquifer is actually part of OU2.

The surface water data set consists of the surface water samples obtained from the Quarry Pond. The surface water samples collected at the Site were analyzed for VOCs and BTEX. No parameters were detected in the surface water samples. Therefore, surface water is not considered to be impacted and CRA did not evaluate the surface water exposure pathways further.

3.1.3.2 SUMMARY OF COPC SELECTION

Based on the conservative screening criteria, the following COPCs have been identified:

Soil Gas

As presented in Table B.2.1 of Appendix B, CRA has identified the COPCs listed below:

- 1,1-dichloroethane
- 1,1-dichloroethylene (1,1-DCE)
- 1,4-dichlorobenzene
- benzene
- bromomethane
- chlorobenzene
- chloroethane
- chloroform
- cyclohexane
- dichlorodifluoromethane
- ethylbenzene
- isopropylbenzene
- methyl tert butyl ether
- methylene chloride
- naphthalene
- tetrachloroethylene (PCE)
- toluene
- trans-1,2-dichlorethylene (trans-1,2-DCE)
- trichloroethylene (TCE)
- trichlorofluoromethane
- vinyl chloride
- xylenes (total)

Each of the above contaminants were detected at maximum concentrations greater than the conservative screening criteria (residential air RSLs), and therefore were identified as COPCs. In addition, cis-1,2-dichloroethylene was retained as a COPC because it was detected and no screening criterion is available.

Surface Soil

As presented in Table B.2.2 of Appendix B, CRA identified the following COPCs in surface soil:

- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- benzo(k)fluoranthene
- dibenz(a,h)anthracene
- indeno(1,2,3-cd)pyrene
- aluminum
- antimony
- arsenic
- barium
- cadmium
- cobalt
- copper
- iron
- lead
- manganese
- nickel
- vanadium
- zinc
- Aroclor-1248
- Aroclor-1254
- Aroclor-1260
- total TEQ (dioxins and furans)

Each of the above contaminants were detected at maximum concentrations greater than the conservative screening criteria (RSLs – residential soil), and therefore CRA identified them as COPCs.

Surface and Subsurface Soil

As presented in Table B.2.3 of Appendix B, CRA identified the following COPCs in surface and subsurface soil:

- benzene
- ethylbenzene
- tetrachloroethylene (PCE)
- vinyl chloride
- xylenes (total)
- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- benzo(k)fluoranthene
- dibenz(a,h)anthracene
- indeno(1,2,3-cd)pyrene
- naphthalene
- aluminum
- antimony
- arsenic
- barium
- cadmium
- cobalt
- copper
- iron
- lead
- manganese
- mercury
- nickel
- vanadium
- zinc
- dieldrin
- Aroclor-1248
- Aroclor-1254
- Aroclor-1260
- total TEQ (dioxins and furans)

Each of the above contaminants were detected at maximum concentrations greater than the conservative screening criteria (RSLs – residential soil), and therefore were identified as COPCs.

Groundwater

As presented in Table B.2.4 of Appendix B, CRA identified the following COPCs in groundwater:

- 1,1-dichloroethane
- 1,2-dichloroethane
- 1,2-dichloroethylene (total)
- chlorobenzene
- chloroform
- cis-1,2-dichlorothylene (cis-1,2-DCE)
- ethylbenzene
- methylene chloride
- tetrachloroethylene (PCE)
- trichloroethylene (TCE)
- vinyl chloride (VC)
- xylenes (total)
- bis(2-ethylhexyl)phthalate
- naphthalene
- antimony
- arsenic
- barium
- cobalt
- iron
- lead
- manganese
- selenium
- vanadium
- Aroclor-1260

- 2-methylnaphthalene
- heptachlor

Each of the above contaminants was detected at maximum concentrations greater than the conservative screening criteria (RSLs – Residential Tapwater) and, therefore, were identified as COPCs.

Sediment

As presented in Table B.2.5 of Appendix B, CRA identified the following COPCs in sediment:

- benzo(a)anthracene
- benzo(a)pyrene
- benzo(b)fluoranthene
- dibenz(a,h)anthracene
- indeno(1,2,3-cd)pyrene
- arsenic
- cobalt
- iron
- manganese
- Aroclor-1254

Each of the above contaminants was detected at maximum concentrations greater than the conservative screening criteria (RSLs – Residential Soil) and, therefore, CRA identified them as COPCs.

Surface Water

There were no chemicals that were detected in surface water samples. As such, CRA did not consider surface water to be a medium of concern at the Site and surface water is not evaluated further in the HHRA.

3.2 EXPOSURE ASSESSMENT

Exposure is defined as the contact of a receptor (i.e., person, animal, or other flora or fauna) with a chemical or physical agent. The exposure assessment is the estimation of the magnitude, frequency, duration, and routes of exposure. An exposure assessment provides a systematic analysis of the potential exposure mechanisms by which a receptor may be exposed to chemical or physical agents at or originating from a study area. The objectives of an exposure assessment are as follows:

1. characterization of exposure setting (see Section 3.2.1)
2. identification of potential exposure pathways (see Section 3.2.2)
3. quantification of exposure (see Section 3.2.3)

3.2.1 CHARACTERIZATION OF EXPOSURE SETTING

The HHRA determines potential exposure pathways through an evaluation of the physical setting of the Site and the potentially exposed populations. A detailed description of the physical setting of the Site is presented in the RI and summarized in Section 2.0. The consideration of Site-specific factors related to land use is important in the development of realistic current and future exposure scenarios and quantification of risks and hazards. The current and future potential land uses that are reasonably expected for the Site determine what populations may potentially be exposed.

3.2.1.1 CURRENT LAND USE

Historically, the Site was operated as a sand and gravel quarry between approximately late 1935 and the 1970s. The Site includes an inactive landfill. The landfill was first licensed as a commercial, industrial, and municipal solid waste disposal facility in 1969 and under went several license modifications over its 50 years of operation. Municipal solid waste received at the landfill was reportedly burnt and, according to the landfill owner, municipal solid waste was not accepted after 1955; although, the landfill was licensed to accept "household waste" until 1975. Burning of combustible materials continued until at least 1971. Foundry sand, fly ash, and slag were largely deposited along the north and northeastern boundary of the Site from approximately 1977 to 1987.

The Site contains an automobile junkyard in the southeastern section of the property and several mixed-use industrial/commercial buildings in the north and northeastern section of the Property. The Site is primarily zoned "M2 - General Industrial" and industrial operations are active in the northern and eastern portions of the Site. No industrial activities are ongoing in the center and southwestern portions of the Site. The southern portion of the Quarry Pond is zoned "C – Conservation". The Site is located in an area of mixed urban, commercial, industrial, and residential development.

The zoning for the off-Site area potentially impacted by historic Site operations is a combination of "M1 - Light Industrial", "M2 - General Industrial", and "C – Conservation". The nearest residential properties are located adjacent to the east and

southeast boundary of the Site and include a single family residence and a trailer park. A paved recreational trail is located adjacent to the Site and runs along the north and northwest boundary of the Site.

The current potentially exposed population includes adolescents who may trespass on the Site, on- and off-Site industrial/commercial workers, and off-Site residents.

3.2.1.2 FUTURE LAND USE

The Site owners plan to restrict future use of the property to non-residential, and it will likely remain under industrial/commercial land use in the future[10]. The future potentially exposed population for the Site includes potential trespassers and industrial/commercial workers. The future potentially exposed populations for off-Site properties include industrial/commercial workers and residents. It is possible that future development of the Site may necessitate some below-grade excavation or construction activity and/or utility installation and servicing. For this reason, CRA evaluated short-term future potential construction/utility worker exposures to Site conditions in the HHRA.

3.2.2 IDENTIFICATION OF POTENTIAL EXPOSURE PATHWAYS

An exposure pathway describes a mechanism by which humans may come into contact with Site-related COPCs. An exposure pathway is complete (i.e., it could result in a receptor contacting a COPC) if all of the following four elements are present:

1. a source or a release from a source [e.g., COPCs released to soil during historical landfill operations (see Section 3.2.2.1)]
2. a probable environmental migration route of a Site-related COPC [e.g., leaching or partitioning from one medium to another (see Section 3.2.2.2)]
3. an exposure point where a receptor may come in contact with a Site-related COPC [e.g., surface and subsurface soil on- and off-Site (see Section 3.2.2.3)]
4. a route by which a Site-related COPC may enter a potential receptor's body [e.g., ingestion, dermal contact, or inhalation (see Section 3.2.2.4)]

10 CRA understands that the owners of certain Site parcels are in the process of implementing a land use restriction that will restrict the use of the Site to commercial and industrial uses.

If any of these four elements are not present, then the exposure pathway is considered incomplete and would not contribute to the total exposure from the Site. Exposure scenarios and complete exposure pathways are discussed in Section 3.2.2.5.

3.2.2.1 RELEASE MECHANISMS

The potential mechanisms of contaminant release at the Site are:

- Potential erosion of the cover material exposing landfill contents so the COPCs are released by direct contact or wind
- Potential leaching of contaminants from landfill contents or contaminated soil to the soil and groundwater
- Potential release of contaminants from exposed sediment or contaminated surficial soil through contact with surface water
- Potential release of contaminants from the soil to ambient air by volatilization and wind
- Potential release of contaminants from the groundwater by volatilization through the unsaturated zone to ambient air or indoor air

Existing off-Site groundwater and soil vapor contamination will be assessed as part of the OU2 RI/FS. The OU1 BRA includes an assessment of risks to off-Site receptors from on-Site groundwater in order to identify risks posed by contaminant concentrations in shallow on-Site groundwater (i.e., OU1) that may be migrating off Site currently or may migrate off-Site in future. Additional sampling is recommended to determine whether contamination in the Upper Aquifer Zone beneath the Site (i.e., OU1) may potentially migrate off-Site. Any such risks will need to be addressed as part of the remedial alternatives assessed in the OU1 FS.

3.2.2.2 FATE AND TRANSPORT IN RECEIVING MEDIA

Many factors control the partitioning of a chemical in the environment. An understanding of the general fate and transport characteristics of the COPCs is important when predicting future theoretical exposure, linking sources with currently contaminated media, and identifying potentially complete pathways to Site media. Therefore, the fate and transport analysis conducted at this stage of the exposure assessment is meant to identify media that are likely to receive Site-related COPCs. The potential contaminant transport mechanisms at the Site are:

- Movement with wind
- Movement with sediment
- Movement during future Site re-development
- Movement with groundwater (i.e., throughout the Site or, movement of existing on-Site groundwater contamination off-Site at concentrations that would pose a risk to existing off-Site receptors)
- Movement of VOCs in soil vapor

3.2.2.2.1 POTENTIAL MIGRATION OF SOIL GAS AND GROUNDWATER COPCs TO AIR

Volatile constituents in groundwater may volatize and migrate into indoor air. Volatile COPCs in soil gas may also migrate to ambient air. CRA calculated the potential indoor air concentrations for the on- and off-Site industrial/commercial worker and off-Site resident using the Johnson & Ettinger (J&E) Model (USEPA, 2004b), and measured soil gas and groundwater concentrations. Appendix C presents the methodology and assumptions used to estimate the indoor air concentrations.

Table B.3.1 of Appendix B presents the estimated ambient air concentration from soil gas for all soil gas COPCs. CRA determined the ambient air concentrations of the COPCs by multiplying the maximum measured soil gas concentration for each COPC by their chemical-specific volatilization factors (VFs) calculated in Table B.3.2 of Appendix B according to methodology provided by the American Society for Testing and Materials, ASTM (2002). CRA then compared the resulting ambient air concentrations to the RSLs for Residential Air. Calculated soil gas to ambient air concentrations for benzene, ethylbenzene, naphthalene, trichloroethylene, and vinyl chloride were greater than the RSL residential air screening concentrations. As such, these chemicals were quantitatively evaluated in the HHRA for potential on-Site ambient air inhalation exposure by trespassers, industrial/commercial workers, and construction/utility workers.

3.2.2.3 POTENTIAL EXPOSURE POINTS

After contaminated or potentially-contaminated media have been identified, the exposure points are determined by identifying whether the potentially exposed population can contact these media.

The exposure domain is the area within which the potentially exposed population may contact the contaminated media. For example, ingestion of surface soil by a current trespasser is complete only in areas where the surface soil is not covered. Therefore, the exposure domain for surface soil ingestion by a current trespasser would include only the areas not under a cover (i.e., asphalt cover, building foundation, etc.). However, CRA conservatively included all of the surface soil data in the surface soil exposure domain to evaluate the trespasser exposure to Site surface soil.

CRA evaluated the indoor air pathway for current and future industrial/commercial and residential buildings located on- and off-Site. For on-Site, the worst case scenario corresponds to a typical small industrial/commercial building that is either existing or could be constructed as part of the future redevelopment of the Site over existing impacted environmental media. For off Site, the worst case scenario corresponds to the smallest building that is occupied and located over potentially impacted environmental media. For future buildings where vapor intrusion is a potentially complete pathway, this exposure pathway can be eliminated by the use of vapor intrusion barriers in the foundations irrespective of whether the proposed location has been evaluated for potential vapor intrusion.

3.2.2.4 POTENTIAL EXPOSURE ROUTES

In general, human receptors may be exposed to different environmental media, including soil, groundwater, sediment, air, and biota that have come in contact with contaminated media. The only potential exposure routes associated with exposure to on-Site soil, soil gas, groundwater, and sediment include direct contact (incidental ingestion, dermal contact, and inhalation of particulates and/or vapors) and inhalation of volatile COPCs migrating to indoor air (via soil gas and groundwater).

3.2.2.5 EXPOSURE SCENARIOS AND COMPLETED EXPOSURE PATHWAYS

Based on an understanding of the four components of an exposure pathway and the current/future conditions of the Site, CRA identified human exposure pathways. As presented in Sections 3.1.1 and 3.1.2, the potential human populations considered relevant to the HHRA for current and future Site conditions include an adolescent trespasser, an industrial/commercial worker, and a construction/utility worker who potentially may be involved in ground intrusive activities during general construction

activities. CRA also considered an off-Site industrial/commercial worker's potential exposure to indoor air in the HHRA, as well as an off-Site resident's potential exposure to indoor air and groundwater.

As noted above, existing off-Site groundwater and soil vapor contamination will be assessed as part of the OU2 RI/FS. The OU1 BRA includes an assessment of risks to off-Site receptors from on-Site groundwater in order to identify risks posed by contaminant concentrations in shallow on-Site groundwater (i.e., OU1) that may be migrating off Site currently or may migrate off-Site in future. Any such risks will need to be addressed as part of the remedial alternatives assessed in the FS.

The HHRA CSM that is shown in Table B.1.1 of Appendix B presents a summary of the exposure media, exposure pathways, exposure routes, and exposed receptors that are considered in the HHRA. CRA identified the following media and potential human exposures (i.e., complete pathways) for quantitative evaluation in the HHRA:

(1) On-Site Surface Soil – Current/Future Condition:

- Incidental ingestion and dermal contact with surface soil by trespasser and industrial/commercial worker

(2) On-Site Air – Current/Future Condition:

- Inhalation of airborne particulate originating from surface soil by trespasser and industrial/commercial worker
- Inhalation of airborne vapors originating from soil gas by trespasser and industrial/commercial worker
- Inhalation of vapors in indoor air originating from soil gas migrating to indoor air by industrial/commercial worker

(3) On-Site Sediment – Current/Future Condition:

- Incidental ingestion and dermal contact with sediment by trespasser and industrial/commercial worker

(4) On-Site Shallow Groundwater - Future Condition:

- Incidental ingestion and dermal contact with on-Site shallow groundwater by off-Site resident (child and adult)

(5) Off-Site Air - Current/Future Condition:

- Inhalation of airborne volatiles originating from on-Site shallow groundwater by off-Site resident (adult and child);

- Inhalation of vapors in indoor air originating from COPCs in on-Site shallow groundwater migrating to indoor air by off-Site industrial/commercial worker and off-Site resident (child and adult);

(6) On-Site Soil (surface and subsurface) - Future Condition:

- Incidental ingestion and dermal contact with soil by construction/utility worker

(7) On-Site Sediment - Future Condition:

- Incidental ingestion and dermal contact with sediment by construction/utility worker

(8) On-Site Air – Future Condition:

- Inhalation of airborne particulate originating from soil by construction/utility worker
- Inhalation of airborne vapors originating from soil gas by construction/utility worker

3.2.3 QUANTIFICATION OF EXPOSURE

To quantify exposure, CRA developed potential exposure scenarios guidance presented in the following USEPA documents:

- USEPA RAGS: Volume 1 - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989 (USEPA, 1989a)
- USEPA RAGS: Volume 1 – Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors, Interim Final, OSWER Directive 9285.6-03, March 25, 1991 (USEPA, 1991a)
- USEPA RAGS: Volume 1 – Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals), Interim, EPA/540/R-92/003, December 1991 (USEPA, 1991b)
- USEPA Assessing Dermal Exposure from Soil, Region III Technical Guidance Manual Risk Assessment, EPA/903-K-95-003, December 1995 (USEPA, 1995a)
- USEPA Exposure Factors Handbook, EPA/600/P-95/002Fa, August 1997 (USEPA, 1997)
- USEPA Region 4 Human Health Risk Assessment Bulletins – Supplement to RAGS, Section 4: Exposure Assessment, May 2000 (USEPA, 2000a)

- USEPA RAGS: Volume 1 - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments), Final, Publication 9285.7-47, December 2001 (USEPA, 2001)
- USEPA Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December 2002 (USEPA, 2002)
- USEPA RAGS: Volume 1 - Human Health Evaluation Manual (Part E, Supplemental Guidance For Dermal Risk Assessment), Final, EPA/540/R/99/005, OSWER Directive 9285.7-02EP, PB99-963312, July 2004 (USEPA, 2004a)
- USEPA User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings, Office of Emergency and Remedial Response, February 22, 2004 (USEPA, 2004b)
- USEPA Child-Specific Exposure Factors Handbook, September 2008 (USEPA, 2008a)
- USEPA RAGS: Volume 1 - Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment, Final, EPA-540-R-070-002, OSWER 9285.7-82, January 2009 (USEPA, 2009a)

In instances where USEPA documents did not present necessary exposure factors, or where more appropriate scientific data were not available, CRA applied professional judgment to develop conservative assumptions that are representative of the Reasonable Maximum Exposure (RME) and are protective of human health.

CRA used two levels of assumptions in the exposure quantifications. The Central Tendency (CT) assumptions present the average or mean value for the assumptions and approximate the most probable exposure conditions. The RME are conservative assumptions that generally utilize the 90th to 95th percentile assumptions, depending upon available data.

CRA determined the CT and RME exposure point concentrations (EPCs) for the various exposure scenarios based on the observed data distribution and the percentage of censored data points (i.e., non-detect results). CRA based both the CT and RME EPCs on the 95 percent upper confidence limit (% UCL) of the mean. Appendix D contains a detailed description of the statistical methods used to determine the 95% UCL.

The arithmetic mean, maximum, and 95% UCL concentrations for the COPCs identified at the Site are summarized in the following tables in Appendix B:

i)	Soil Gas	-	Table B.3.3
ii)	Surface Soil	-	Table B.3.4
iii)	Surface and Subsurface Soil	-	Table B.3.5

iv)	Groundwater	-	Table B.3.6
v)	Sediment	-	Table B.3.7

Air

CRA determined ambient air and indoor air EPCs based upon modeled air concentrations in each exposure unit. CRA developed the ambient air modeling approach (equations and inputs) for trespassers, industrial/commercial workers, and construction/utility workers in ambient air from soil gas. The measured concentrations for soil gas were used as representative of emissions from groundwater and soil. The soil gas provides a profile of potential contaminants emitted from both impacted sources. CRA modeled indoor air EPCs for on-Site industrial/commercial worker exposure to volatile COPCs in indoor air from soil gas and for the off-Site industrial/commercial workers and off-Site resident exposure to volatile COPCs in indoor air from on-Site shallow groundwater, based on the Johnson & Ettinger (J&E) Indoor Air Vapor Intrusion Model (USEPA, 2004b). CRA used the soil gas data as inputs to estimate the on-Site indoor air concentrations while on-Site groundwater data were used as inputs to estimate the off-Site indoor air concentrations. Soil gas data reflects VOC emissions from on-Site soil and groundwater. The J&E modeling approach applied in the HHRA is described in Appendix C.

Quantification of exposure is discussed further below in terms of estimation of intake (Section 3.2.3.1) and exposure scenario assumptions (Section 3.2.3.2).

3.2.3.1 EXPOSURE ESTIMATES

In the HHRA, the magnitude of exposure reflects the chemical concentration, contact rate, exposure time, and body weight. This section outlines the approach for determining the amount of the identified COPCs to which the selected receptors may be exposed via the media.

3.2.3.1.1 SPECIFIC INTAKE EQUATIONS

The following sections provide intake equations for ingestion, dermal, and inhalation exposure to soil and groundwater that CRA applied in the HHRA. In the HHRA, exposure estimates reflect chemical concentration, contact rate, exposure time, and body weight in a term called "intake" or "dose".

Inhalation of Indoor Air/Ambient Air Exposure Pathway

The equation for calculating chemical intake from the inhalation of indoor air or ambient air after USEPA (1989a) is:

$$CDI = \frac{C_{IA/AA} \times FT \times EF \times ED}{AT} \qquad \text{Equation 1}$$

where:

CDI	=	chronic daily intake via inhalation (milligrams per cubic meter or mg/m^3)
$C_{IA/AA}$	=	chemical concentrations in indoor/ambient air (mg/m^3)
FT	=	fraction of time exposed (hours per 24 hours exposed) (unitless)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
AT	=	averaging time [period over which exposure is averaged] (days)

The equation for calculating chemical intake from the inhalation of vapors originating from groundwater used during potable household use by off-Site residents (child and adult) is:

$$CDI = \frac{C \times FT \times EF \times ED \times VF}{AT} \qquad \text{Equation 2}$$

where:

CDI	=	chronic daily intake via inhalation (mg/m^3)
CW	=	chemical concentration (milligrams per liter or mg/L)
FT	=	fraction of time exposed
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
VF	=	volatilization factor
AT	=	averaging time [period over which exposure is averaged] (days)

Incidental Ingestion of Soil Exposure Pathway

The equation for calculating chemical intake from the incidental ingestion of soil (USEPA, 1989a) is:

$$CDI = \frac{C \times IR \times CF \times EF \times ED}{BW \times AT}$$ Equation 3

Where:

CDI = chronic daily intake (milligrams per kilogram or mg/kg body weight/day)
C = chemical concentration (mg/kg)
IR = incidental ingestion rate (mg soil/day)
CF = conversion factors (e.g., kg/10^6 mg)
EF = exposure frequency (days/year)
ED = exposure duration (years)
BW = body weight (kg)
AT = averaging time [period over which exposure is averaged] (days)

This equation was also applied for incidental ingestion of sediment.

Soil Dermal Contact Exposure Pathway

The equation for calculating chemical intake from dermal exposure to soil (USEPA, 1989a) is:

$$CDI = \frac{C \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$ Equation 4

where:

CDI = chronic daily intake (mg/kg body weight/day)
C = chemical concentration (e.g., mg/kg for soil)
CF = conversion factors (e.g., kg/10^6 mg)
SA = skin surface area available for contact (square centimeters or cm^2/event)
AF = soil to skin adherence factor (mg/cm^2)
ABS = chemical absorption rate (unitless)
EF = exposure frequency (days/year)
ED = exposure duration (years)
BW = body weight (kg)
AT = averaging time (averaging period, days)

CRA also used this equation for dermal contact of sediment.

Soil Particulate or Vapor Inhalation from Soil Exposure Pathway

The equation for calculating chemical intake from the inhalation of particulate or vapor originating from soil is, after USEPA (2002):

$$CDI = \frac{C \times FT \times EF \times ED}{(VF \text{ or } PEF) \times AT} \qquad \text{Equation 5}$$

where:

CDI	=	chronic daily intake via particulate and soil vapor inhalation (mg/m^3)
C	=	chemical concentration in soil (mg/kg)
FT	=	fraction of time exposed (hours per 24 hours) (unitless)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
VF	=	volatilization factor (m^3/kg)
PEF	=	particulate emission factor (m^3/kg)
AT	=	averaging time (averaging period, days)

Ingestion of Groundwater Exposure Pathway

The equation for calculating chemical intake from the residential (child and adult) ingestion of potable groundwater is:

$$CDI = \frac{C \times IR \times EF \times ED}{BW \times AT} \qquad \text{Equation 6}$$

where:

CDI	=	chronic daily intake (mg/kg body weight/day)
C	=	chemical concentration (mg/L)
IR	=	ingestion rate (L water/day)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (averaging period, days)

Groundwater Dermal Contact Exposure Pathway

The equation for calculating chemical intake from dermal exposure during potable household use of groundwater and exposure to groundwater during excavation that results in contact with groundwater (USEPA, 2004a) is:

$$CDI = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT}$$ Equation 7

where:

CDI	=	chronic daily intake (mg/kg body weight/day)
SA	=	skin surface area available for contact (cm^2)
DA_{event}	=	absorbed dose per event (mg/cm^2-event)
EF	=	exposure frequency (days/year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (averaging period, days)

The dose absorbed per unit area per event (DA_{event}) equation for calculating dermal exposure to groundwater (USEPA, 2004a) is presented below:

For inorganic COPCs:

$$DA_{event} = PC \times C \times CF \times ET$$

For organic COPCs:

$$\text{If } t_{event} \le t^*, \text{ then } DA_{event} = 2 \times FA \times PC \times C \times CF \sqrt{\frac{6 \times t_{event} \times ET}{\pi}},$$

$$\text{If } t_{event} > t^*, \text{ then } DA_{event} = FA \times PC \times C \times CF \left[\frac{ET}{1+B} + 2 \times \tau_{event} \times \left(\frac{1 + 3 \times B + 3 \times B^2}{(1+B)^2} \right) \right]$$

where:

C	=	chemical concentration (e.g., mg/cm^3 water)
FA	=	fraction absorbed water (dimensionless)
τ_{event}	=	lag time per event (hr/event)
t^*	=	time to reach steady state (hr) = 2.4 x τ_{event}
π	=	pi (3.14)
B	=	dimensionless ratio of permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis (dimensionless)
PC	=	Permeability constant
CF	=	Conversion factor
ET	=	Exposure time (hr/day)

For carcinogens, a lifetime average daily dose of the chemical is estimated which pro-rates the total cumulative intake over a lifetime. An averaging time (AT) of 70 years is used for carcinogens.

For non-carcinogens, the chemical intake is estimated over the appropriate exposure period or averaging time. The averaging time selected depends on the exposure

duration of the specific population being evaluated and the toxic endpoint being assessed.

3.2.3.2 EXPOSURE SCENARIO ASSUMPTIONS

CRA developed different exposure scenarios for each of the receptor populations that were evaluated in the HHRA. Descriptions of each exposure scenario and associated exposure assumptions are presented in the following subsections. Note that indirect exposure of receptors to surface soil via dust or volatile inhalation and soil gas, soil, and groundwater via volatile inhalation were considered separately in the evaluation of exposure to indoor and ambient air, as appropriate.

Receptor characteristics had values assigned for CT and RME scenarios. In some cases these values differed between scenarios (e.g., exposure frequency, exposure duration, etc.) and in other cases these values were the same for both CT and RME scenarios (e.g., body weight, skin surface area, soil ingestion rate, etc.). The assignment of receptor characteristics by scenarios followed standard practices used by regulating agencies and risk assessment professionals. The specific values used are presented in the following sections.

Exposure scenario assumptions are presented in the tables below for the trespasser, industrial/commercial worker, construction utility worker, and resident (adult and child).

3.2.3.2.1 TRESPASSER

Exposure Frequency and Duration

The assumptions that CRA used in the estimation of the magnitude of the adolescent trespasser's exposure to ambient air, soil, and sediment are summarized in the following table.

Exposure Factor	*Units*	*Scenario*	*Trespasser*
			Value Used - Adolescent
Soil/Sediment Ingestion Rate [1]	mg/day	CT and RME	100
Soil/Sediment Skin Adherence Factor [2]	mg/cm^2	CT	0.04
		RME	0.2
Dermal Absorption Factor [3]	%/100	CT and RME	Chemical-specific
Skin Surface Area [4]	cm^2	CT and RME	3,900
Fraction of Time Exposed – Inhalation	unitless	CT	1.7 hr/24 hr
		RME	3.4 hr/24 hr
Exposure Frequency [6]	days/year	CT	25.3
		RME	50.6
Exposure Duration	years	CT	10
		RME	10
Body Weight [8]	kg	CT and RME	45
Carcinogenic Averaging Time [9]	days	CT and RME	25,550
Non-Carcinogenic Averaging Time [9]	days	CT and RME	3,650
Conversion Factor	kg/mg	CT and RME	1.00E-06
Particulate Emission Factor (PEF) [1]	m^3/kg	CT and RME	1.36E+09
Volatilization Factor (VF) [10]	m^3/kg	CT and RME	Chemical-specific

Notes:

1. Obtained from USEPA (2002).
2. Obtained from USEPA (2004a).
3. Obtained from USEPA (2004a) and USEPA (1995a). Published values obtained from USEPA 1995a include: arsenic (3%), cadmium (0.1%), metals (1%), VOCs vapor pressure (VP) > benzene VP (3%), VOCs VP < benzene VP (0.05%), PAHs (13%), SVOCs (10%), PCBs (14%), pesticides (10%).
4. Surface area is the 50th percentile value from Table 7-1, Recommended Values for Total Body Surface Area, Males and Females Combined. The total body surface area was multiplied by 0.25 (25 percent) to account for exposed skin (USEPA, 2008a).
5. The fraction of time exposed is the 50th percentile from Table 16-1, Recommended Values for Activity Factors - Time Outdoors (total) (USEPA, 2008a). The time spent outdoors for a 11- to 16-year old adolescent of 100 min/day equates to 1.7 hrs (CT) [100/60]. The RME is double the CT value and is equal to 3.4 hrs. The time spent outdoors for the 6- to 11-year old child presented in USEPA (2008a) was not considered for the trespasser fraction of time exposed as it is assumed that an older child is more characteristic of an adolescent that may trespass.
6. The exposure frequency is the 50th percentile from Table 16-1, Recommended Values for Activity Factors - Time Outdoors (total) (USEPA, 2008a). The time spent outdoors for 11- to 16-year old adolescent of 100 min/day from out of a possible 365 days equates to 25.3 days (CT) [(100 min/d /1440 total min/d) × 365]. The RME is double the CT value for 50.6 days. The time spent outdoors for the 6- to 11-year old child presented in USEPA (2008a) was not considered for the trespasser exposure frequency as it is assumed that an older child is more characteristic of an adolescent that may trespass.
7. It is assumed that the trespasser is 7 through 16 years old. Therefore, the exposure duration is set to 10 years, based on USEPA (2000a).
8. Obtained from (USEPA 2000a).
9. Obtained from USEPA (1989a).
10. Volatilization factor calculated using equations presented in USEPA (2002); see further discussion in text below.

All exposure assumptions and equations utilized in the calculation of the magnitude of exposure to COPCs in soil gas, soil, and sediment for an adolescent trespasser are also summarized in the following tables in Appendix B:

- Table B.4.2: ambient air exposure for current/future trespasser
- Table B.4.7: surface soil exposure for current/future trespasser
- Table B.4.14: sediment exposure for current/future trespasser

To determine the potential inhalation exposure to COPCs in soil gas migrating to ambient air, CRA determined the concentrations of COPCs in ambient air by multiplying the maximum measured soil gas concentration for each COPC in soil gas by their chemical-specific volatilization factors (VFs) calculated according to the methodology provided by the ASTM (2002). The equations and inputs for the calculated ambient air concentrations are presented in Table B.4.4 of Appendix B.

To determine the potential inhalation exposure to volatile COPCs in soil volatilizing to ambient air, CRA used a VF to estimate ambient air concentrations based on the soil concentration. The VF is chemical specific and was calculated using the approach presented in USEPA (2002). Site-specific soil and chemical-specific properties were used in calculating the VF. The equations and inputs for the calculated VF values are presented in Table B.4.8 of Appendix B.

3.2.3.2.2 INDUSTRIAL/COMMERCIAL WORKER

Exposure Frequency and Duration

The assumptions that CRA used in the estimation of the magnitude of the industrial/commercial worker's exposure to indoor air, ambient air, soil, and sediment are summarized in the following table.

Exposure Factor	*Units*	*Scenario*	*Value Used-Industrial/Commercial Worker*
Soil/Sediment Ingestion Rate [1]	mg/day	CT and RME	100
Soil/Sediment-Skin Adherence Factor [2]	mg/cm^2	CT	0.02
		RME	0.2
Dermal Absorption Factor [3]	%/100	CT and RME	Chemical-specific
Skin Surface Area [4]	cm^2	CT and RME	3,300
Fraction of Time Exposed [5]	unitless	CT and RME	8 hr/24 hr
Exposure Frequency [6]	days/year	CT	219
		RME	250
Exposure Duration [2]	years	CT	9
		RME	25
Body Weight [1]	kg	CT and RME	70
Carcinogenic Averaging Time [7]	days	CT and RME	25,550
Non-Carcinogenic Averaging Time [7]	days	CT	3,285
		RME	9,125
Conversion Factor	mg/kg	CT and RME	1.00E-06
Particulate Emission Factor [1]	m^3/kg	CT and RME	1.36E+09
Volatilization Factor [8]	m^3/kg	CT and RME	Chemical-specific

Notes:

1 Obtained from USEPA (2002).
2 Obtained from USEPA (2004a).
3 Obtained from USEPA (2004a) and USEPA (1995a). Published values obtained for USEPA 1995a include: arsenic (3%), cadmium (0.1%), metals (1%), VOCs VP > benzene VP (3%), VOCs VP < benzene VP (0.05%), PAHs (13%), SVOCs (10%), PCBs (14%), pesticides (10%).
4 The skin surface area available for contact includes the head, hands, and forearms (USEPA 2004a).
5 Professional Judgment; fraction of time exposed is based on an assumed 8 hour work day during a 24 hour period.
6 The exposure frequency is based on an exposure frequency of 5 days/week during a period of 50 weeks/year (USEPA 2004a).
7 Obtained from USEPA (1989a).
8 Volatilization factor calculated using equations presented in USEPA (2002); see further discussion in text below.

All exposure assumptions and equations utilized in the calculation of the magnitude of exposure to COPCs in soil gas, soil, groundwater, and sediment for an industrial/commercial worker are also summarized in the following tables in Appendix B:

- Table B.4.1: Indoor air exposure for current/future on- and off-Site industrial/commercial worker
- Table B.4.3: Ambient air exposure for current/future on-Site industrial/commercial worker
- Table B.4.9: Surface soil exposure for current/future on-Site industrial/commercial worker
- Table B.4.15: Sediment exposure for current/future on-Site industrial/commercial worker

To determine the potential inhalation exposure to COPCs in soil gas migrating to ambient air, CRA determined the concentrations of COPCs in ambient air by multiplying the maximum measured soil gas concentration for each COPC in soil gas by their chemical-specific VFs calculated according to the methodology provided by the ASTM (2002). The equations and inputs for the calculated ambient air concentrations are presented in Table B.4.4 of Appendix B.

To determine the potential inhalation exposure to volatile COPCs in soil volatilizing to ambient air, CRA used a VF to estimate ambient air concentrations based on the soil concentration. The VF is chemical specific and was calculated using the approach presented in USEPA (2002). Site-specific soil and chemical-specific properties were used in calculating the VF. The equations and inputs for the calculated VF values are presented in Table B.4.10 of Appendix B.

To determine the potential inhalation exposure to volatile COPCs migrating to indoor air, CRA modeled the concentrations of COPCs in indoor air based on the concentrations of volatile chemicals in on-Site soil gas for the on-Site industrial/commercial worker and on-Site groundwater for the off-Site industrial/commercial worker and using the J&E Model, as described in Appendix C.

3.2.3.2.3 CONSTRUCTION/UTILITY WORKER

Exposure Frequency and Duration

The assumptions that CRA used to determine the exposure of the construction/utility worker to soil and sediment while performing ground intrusive activities are summarized in the following table.

Exposure Factor	*Units*	*Scenario*	*Value Used-Construction/Utility Worker*
Soil/Sediment Ingestion Rate [1]	mg/day	CT and RME	330
Soil/Sediment-Skin Adherence Factor [2]	mg/cm^2	CT	0.1
		RME	0.3
Dermal Absorption Factor [3]	%/100	CT and RME	chemical-specific
Skin Surface Area [4]	cm^2	CT and RME	3,300
Fraction of Time Exposed [5]	unitless	CT and RME	8 hr/24 hr
Exposure Frequency [6]	days/year	CT	60
		RME	120
Exposure Duration [7]	years	CT and RME	1
Body Weight [1]	kg	CT and RME	70
Carcinogenic Averaging Time [8]	days	CT and RME	25,550
Non-Carcinogenic Averaging Time [8]	days	CT and RME	365
Conversion Factor	mg/kg	CT and RME	1.00E-06
Particulate Emission Factor [9]	m^3/kg	CT and RME	site-specific
Volatilization Factor [10]	m^3/kg	CT and RME	chemical-specific

Notes:

1 Obtained from USEPA (2002).
2 Obtained from USEPA (2004a).
3 Obtained from USEPA (2004a) and USEPA (1995a). Published values obtained for USEPA 1995a include: arsenic (3%), cadmium (0.1%), metals (1%), VOCs VP > benzene VP (3%), VOCs VP < benzene VP (0.05%), PAHs (13%), SVOCs (10%), PCBs (14%), pesticides (10%).
4 The skin surface area available for contact includes the head, hands, and forearms (USEPA 2004a).
5 Professional Judgment; fraction of time exposed is based on an assumed 8 hour work day during a 24 hour period.
6 The RME exposure frequency is based on an exposure frequency of 5 days/week during a period of 6 month/year (120 days), which is based on professional judgment. CT exposure is half of the RME or 3 months/year (60 days).
7 Exposure duration is based on an assumed construction campaign occurring for a one year period, which is based on professional judgment.
8 Obtained from USEPA (1989a).
9 The construction/utility worker Particulate Emission Factor (PEF) is site-specific and was calculated using the approach presented by USEPA (2002). The equations used to develop the site-specific PEF are presented in Table B.4.12 of Appendix B.
10 Volatilization factor calculated using equations presented in USEPA (2002); see further discussion in text below.

The exposure assumptions and equations utilized in the calculation of the magnitude of exposure to COPCs in soil and sediment for the construction/utility worker are also summarized in the following tables in Appendix B:

- Table B.4.5: ambient air exposure for the future construction/utility worker
- Table B.4.11: surface and subsurface soil exposure for the future construction/utility worker
- Table B.4.16: sediment exposure for the future on-Site construction/utility worker

To determine the potential inhalation exposure to COPCs in soil gas migrating to ambient air, CRA calculated the concentrations of COPCs in ambient air by multiplying

the maximum measured soil gas concentration for each COPC in soil gas by their chemical-specific VFs calculated according to the methodology provided by the ASTM (2002). The equations and inputs for the calculated ambient air concentrations are presented in Table B.4.6 of Appendix B.

To determine the potential inhalation exposure to non-volatile COPCs in soil particulate (dust), CRA used a Particulate Emission Factor (PEF) to estimate ambient air concentrations based on the soil concentration. The PEF is Site-specific and was calculated using the equations and inputs presented in USEPA guidance (USEPA, 2002). The equations and inputs for the calculated PEF values are presented in Table B.4.12 of Appendix B.

To determine the potential inhalation exposure to volatile COPCs in soil volatilizing to ambient air, CRA used a VF to estimate ambient air concentrations based on the soil concentration. The VF is chemical specific and was calculated using the approach presented in USEPA (2002). Site-specific soil and chemical-specific properties were used in calculating the VF. The equations and inputs for the calculated VF values are presented in Table B.4.13 of Appendix B.

3.2.3.2.4 RESIDENT

The exposure assumptions that CRA used in the estimation of the magnitude of the exposure of a resident (child and adult) to indoor air (from soil gas and off-Site groundwater), ambient air, and groundwater through potable household use are summarized in the following table.

Exposure Factor	*Units*	*Scenario*	*Value Used - Off Site Resident Potable Groundwater*	
			Child	*Adult*
Water Ingestion Rate [1]	L/day	CT and RME	1	2
Skin Surface Area [2]	cm^2	CT and RME	6,600	18,000
Fraction of Time Exposed – Indoor Air [3]	unitless	CT	18.5 hr/24 hr	18.5 hr/24 hr
		RME	24 hr/24 hr	24 hr/24 hr
Fraction of Time Exposed – Groundwater for Household Use [3]	unitless	CT	0.33 hr/24 hr	0.25 hr/24 hr
		RME	1 hr/24 hr	0.58 hr/24 hr
Exposure Time [2]	hours/day	CT	0.33	0.25
		RME	1	0.58
Exposure Frequency [2]	days/year	CT and RME	350	350
Exposure Duration [2]	years	CT	6	3
		RME	6	24
Body Weight [4]	kg	CT and RME	15	70
Skin Permeability Constant [5]	cm/hr	CT and RME	Chemical-specific	Chemical-specific
Dermal – Fraction absorbed [5]	unitless	CT and RME	Chemical-specific	Chemical-specific
Dermal Lag time [5]	hr/event	CT and RME	Chemical-specific	Chemical-specific
Dermal B constant [5]	unitless	CT and RME	Chemical-specific	Chemical-specific
Carcinogenic Averaging Time [6]	days	CT and RME	25,550	25,550
Non-Carcinogenic Averaging Time [6]	days	CT	2,190	1,095
		RME	2,190	8,760
Conversion Factor	L/cm^3	CT and RME	0.001	0.001
Volatilization Factor [7]	L/m^3	CT and RME	0.5	0.5

Notes:

1 Obtained from USEPA (1991a).
2 Obtained from USEPA (2004a).
3 Fraction of time exposed – indoor air is based on the 50th and 95th percentile from Table 16-1, Recommended Values for Activity Factors - Time Indoors (at residence) (USEPA, 2008a). The time spent indoors for <1 year old of 1108 min/day equates to 18.5 hrs (CT) [1108/60] and 24 hrs (RME) [1440/60]. It is assumed that the adult will spend the same amount of time indoors with their child. The fraction of time exposed for household use of groundwater was obtained from USEPA, 2004a.
4 Obtained from USEPA (2002).
5 The permeability constant, fraction absorbed, lag time per event, and B constant used in the calculation of the dermal exposure to groundwater (DA_{event}) are chemical-specific and calculated using equations from USEPA (2004a).
6 Obtained from USEPA (1989a).
7 Obtained from USEPA (1991b).

The exposure assumptions and equations utilized in the calculation of the magnitude of exposure to COPCs in on-Site groundwater for an off-Site resident are also summarized in the following tables in Appendix B:

- Table B.4.17: indoor air exposure for current/future off-Site resident
- Table B.4.18: groundwater (household use) exposure for current/future off-Site resident

To determine the potential inhalation exposure to volatile COPCs migrating to indoor air, CRA modeled the concentration of chemicals in indoor air based on the

concentrations of volatile chemicals in on-Site groundwater and using the J&E Model, as described in Appendix C.

3.2.3.3 EVALUATION OF EXPOSURES TO LEAD IN SOIL AND WATER

CRA identified lead as a COPC in soil and groundwater. Lead was detected in Site groundwater samples; however, due to the depth of groundwater (greater then 15 ft bgs) ground intrusive activities are not likely to extend to a depth that will expose groundwater. As a result, exposure to lead in groundwater was not evaluated further. Therefore, the HHRA evaluated only exposure to lead in soil. As such, the industrial/commercial and construction/utility workers performing various duties at the Site are reasonably anticipated to contact lead in soil only.

The HHRA included the quantitative evaluation of the household use of groundwater. As a result, the HHRA also evaluated the off-Site resident child exposure to lead in groundwater.

A trespasser may be exposed to lead in Site soil. However, as the average exposure frequency for the trespasser is only 25.3 days/year, the lead exposure for this receptor would be considered low in comparison to industrial/commercial workers having an average exposure frequency of 219 days/year. Due to the low frequency of exposure by trespassers, lead in blood would not accumulate to concentrations that would result in unacceptable risks. Therefore lead exposure to the trespasser was not evaluated further. The HHRA estimates the 95th percentile blood lead concentration for industrial/commercial and construction/utility worker exposure to lead in soil using the model described below in Sections 3.2.3.3.1. The HHRA estimates the 95th percentile blood lead concentration for the child resident exposure to lead in groundwater using the model described below in Sections 3.2.3.3.2.

3.2.3.3.1 ADULT LEAD EXPOSURE

Adult Lead Exposure Equation

The best available method for determining hazards associated with non-residential adult exposures to lead-impacted soil and water is based on the adult lead exposure equation as presented by USEPA (2003a). The Technical Review Workgroup (TRW) has indicated that the Adult Exposure Equation is a suitable and appropriate model for assessing

adult exposures to lead. The Adult Exposure Equation recommended for use by the TRW is as follows:

$$PbB_{fetal,0.95} = \left(PbB_{adult,0} + PbB_{adult,site}\right) \times GSD_{i,adult}^{1.645} \times R_{fetal/maternal}$$

where:

$PbB_{fetal,\,0.95}$ = 95th percentile target blood lead (PbB) concentration in the fetus (micrograms per deciliter or µg/dL)

$PbB_{adult,0}$ = typical lead concentration (µg/g) (appropriate average concentration for individual)

$R_{fetal/maternal}$ = mean ratio of fetal to maternal PbB

$GSD_{i,adult}$ = individual Geometric Standard Deviation, an exponent of 1.645 represents the standard normal deviate used to calculate the 95th percentile from a lognormal distribution of blood lead concentration

$PbB_{adult,\,site}$ = adult blood lead concentration (µg/dL) contributed by exposure to lead containing media on Site as shown below

$$PbB_{adult,site} = \frac{BKSF \times [\,(PbS \times IR_S \times AF_S \times EF_S)\,]}{AT}$$

where:

BKSF = Biokinetic slope factor (µg/dL blood lead increase per µg/day lead uptake)

PbS = Soil lead concentration (µg/g)

IR_S = Ingestion rate of soil (g/day)

EF_S = Exposure frequency for contact with assessed soil (days/yr)

AF_S = Absolute absorption fraction of lead in soil

AT = Averaging time

Adult Lead Exposure Equation Input Parameters

The basis for selection of input parameters for the above model is discussed below.

(i) Media Lead Concentrations (PbS):

CRA used the arithmetic mean concentrations of lead in the media, consistent with the adult lead model. The arithmetic mean concentrations of lead in Site

surface soil (industrial/commercial worker) and surface and subsurface soil (construction/utility worker) are as follows:

Receptor	*Soil (µg/g)*
Industrial/Commercial Worker	991
Construction/Utility Worker	1,105

(ii) Mean Ratio of Fetal to Maternal PbB ($R_{fetal/maternal}$):

Various studies have estimated an average fetal-to-maternal PbB ratio of 0.9 based on a weight-of-evidence approach. USEPA has also used this value in the Adult Exposure Model. CRA used the 0.9 in the model.

(iii) Individual Geometric Standard Deviation ($GSD_{i,adult}$):

This parameter is used to assess variability in blood lead concentrations among different individuals. Few data points are available regarding GSD values reflecting individual variability. Instead, GSD values reflecting community variability (which would be expected to be greater than individual variability) are frequently applied to estimate individual variability. Various studies have indicated that community GSDs may range from approximately 1.8 to 2.1 depending on the demographics. CRA used a value for GSD of 2.1 in this model based on the TRW Lead guidance assuming a heterogeneous population.

(iv) Target PbB Value ($PbB_{95fetal}$):

This parameter is the 95th percentile target blood lead (PbB) concentration in the fetus (µg/dL). The goal is intended to ensure that $PbB_{95fetal}$ is not greater than 10 µg/dL.

(v) Baseline PbB Value ($PbB_{adult,0}$):

This parameter is specific to the population in the area of interest. CRA could not identify any source of data describing blood lead concentrations for the population in the vicinity of the Site. Therefore, CRA used published reference data to determine a representative value. Various studies have indicated that Baseline PbB values range from approximately 1.7 to 2.2 depending on the demographics. CRA used a value of 1.9 µg/dL for this input parameter based on the TRW Lead guidance.

(vi) Biokinetic Slope Factor (BKSF in µg/dL per µg/day):

The TRW adopted a BKSF of 0.4, derived for the baseline human health risk assessment for the California Gulch Superfund Site. CRA used the default value of 0.4 for the parameter BKSF in the modeling.

(vii) Soil Absolute Absorption Fraction of Lead (AF_s):

TRW uses 12% as the absorbed fraction of lead from soil for adults, based on an absorption factor for soluble lead of 0.20 and a relative bioavailability of 0.6.

(vii) Soil Ingestion Rate (IR_s in g/day):

CRA used a soil ingestion rate of 0.1 and 0.33 g/day for an industrial/commercial worker and construction/utility worker, respectively, at the Site (USEPA, 2002b).

(ix) Exposure Frequency (EF_S in days/yr):

CRA used an exposure frequency of 219 days/year for an industrial/commercial worker based on an average exposure frequency of 5 days per week during a period of 50 weeks per year. For the construction/utility worker scenario, CRA used an exposure frequency of 60 days/year based on an exposure frequency of 5 days per week during a period of 6 month per year as the average or mean exposure in the modeling.

(x) Averaging Time (AT in days):

CRA used an averaging time of 307 days/year (219 days per year/5 days per week = 44 weeks per year × 7 days per week) for an industrial/commercial worker based on the time spent at work by both full-time and part-time workers. For the construction/utility worker scenario, CRA used an averaging time of 84 days/year (60 days per year/5 days per week = 12 weeks per year × 7 days per week) based on an assumed construction campaign occurring within a one year period.

3.2.3.3.2 CHILD LEAD EXPOSURE

CRA used the Integrated Exposure Uptake Biokinetic (IEUBK) model for lead exposure in children to determine the hazards associated with exposure to lead in groundwater consumed through household use by residents living in off-Site buildings, based on the assumption that the child resident is considered to be more sensitive than the adult resident. The IEUBK model provides a method for predicting blood lead concentrations in populations exposed to lead in several different media. The impetus for the development of this model was the USEPA's conclusion that a threshold does not exist for many of the non-cancer effects of lead in infants and young children. The IEUBK Model is a simulation model that uses mathematical equations to estimate the lead concentration in blood (PbB) of a child (or population of children) in the 0- to 7-year age group who are exposed to lead in various media such as soil, air, diet, water, and other

potential sources. Young children are considered to be unimpacted when the model predicts that less than 5 percent of children will have blood lead concentrations greater than 10 μg/dL (USEPA, 1994). CRA used the IEUBKwin32 Model 1.1, Build 264 to determine the hazard for lead exposure in groundwater for an off-Site resident.

For this evaluation, CRA determined the intake of lead for the ingestion of household drinking water. The media and route exposure point concentrations and intake rates that CRA used for the resident exposure scenario for the Site in the IEUBK model are presented in Table E.2 of Appendix E. A default lead concentration in air of 0.100 μg/m^3 was used as the input into the IEUBK model. CRA used the arithmetic mean groundwater lead concentration of 3.24 μg/L, as presented in Table B.3.6 of Appendix B, in the model. For soil, CRA applied the default lead concentration of 200 mg/kg, as the HHRA only evaluated potential groundwater exposure to the off-Site resident. CRA used the model default values for the dietary lead intake for each age range.

3.3 TOXICITY ASSESSMENT

The purpose of the toxicity assessment is to evaluate available evidence regarding the potential for particular contaminants to cause adverse effects in potentially exposed individuals and to provide, where possible, an estimate of the relationship between the extent of exposure to a contaminant and the increased likelihood or severity of adverse effects.

The toxicity assessment is accomplished in two steps: hazard identification and dose-response assessment. The first step, hazard identification, is the process of determining whether exposure to an agent can cause an increase in the incidence of a particular adverse health effect (e.g., cancer and liver damage) and whether the adverse health effect is likely to occur in humans. Typically, this is established based on studies performed on laboratory animals.

The second step, dose-response evaluation, is the process of quantitatively evaluating the toxicity information and characterizing the relationship between the dose of the contaminant administered or received, and the incidence of adverse health effects in the potentially exposed population. From this quantitative dose-response relationship, numerical values, known as toxicity values (i.e., reference doses and slope factors), are derived. These are used to estimate the incidence or potential for adverse effects as a function of human exposure to the agent. These toxicity values are used in the risk characterization step to estimate the potential for adverse effects occurring in humans at different exposure levels.

The relationship between the dose of a COPC and its toxic response must be determined to conduct a risk characterization. CRA derived the dose-response relationships for various constituents or constituent groups from published toxicity data. The USEPA have reviewed the published data and developed several sets of values to provide quantitative estimates of the toxicity of chemicals for different effects and routes of exposure. The USEPA (2003b) has recommended a hierarchy for the selection of toxicological criteria in the risk assessment process. This hierarchy was followed to the fullest extent possible in this HHRA:

- Tier 1 - USEPA's IRIS
- Tier 2 - USEPA's Provisional Peer Reviewed Toxicity Values (PPRTVs)
- Tier 3 - Other Toxicity Values

CRA used USEPA Regional Screening Level Tables (USEPA, 2009b) extensively as a Tier 3 source of toxicity values, even though these are considered a secondary source. Other Tier 3 sources included the USEPA's Health Effects Assessment Summary Tables (HEAST, 1997).

3.3.1 DOSE RESPONSE ASSESSMENT

The toxicity values used in risk evaluations are the chronic doses, generally referred to as the reference dose (RfD) and reference concentrations (RfC) (for non-carcinogenic effects), and cancer slope factors (CSF) and inhalation unit risk factors (URF) (for carcinogenic effects). The RfD or RfC is an estimate (with uncertainty spanning approximately an order of magnitude or greater) of a daily exposure level for the human population, including sensitive sub-populations that is not likely to cause an appreciable risk of deleterious effects during a lifetime. Chronic RfDs or RfCs are specifically developed to be protective for long-term exposure to a compound (e.g., a Superfund program guideline is 7 years to a lifetime). The CSF or URF is a plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The CSF or URF is used to estimate an upper-bound probability of an individual potentially developing cancer as a result of a lifetime exposure to a particular concentration of a potential carcinogen.

3.3.1.1 NON-CARCINOGENIC HAZARDS

For substances suspected to cause non-carcinogenic chronic effects, the health criteria are usually expressed as chronic intake levels or RfDs [in units of mg/(kg-day)] or RfCs (in units of mg/m^3) concentrations less than which, no adverse effects are expected. In contrast to the toxicological model used to assess carcinogenic risk, which assumes no concentration threshold, the non-carcinogenic dose-response model postulates a "threshold".

In this risk assessment, chronic RfDs and RfCs are used as the toxicity values for non-carcinogenic health effects. Uncertainty factors are incorporated into the RfDs or RfCs to account for extrapolations from animal toxicity data, data quality, and to protect sensitive sub-populations. The basis of an RfD or RfC is usually the highest dose/concentration administered to laboratory animals that did not cause observable adverse effects after chronic (usually lifetime) exposure. This is called the No-Observed Adverse Effect Level (NOAEL). The NOAEL is then divided by an uncertainty (safety) factor, and sometimes an additional modifying factor, to obtain the RfD or RfC. In general, an uncertainty factor of 10 is used to account for interspecies variation and another factor of 10 to account for sensitive human populations. Additional factors of 10 are included in the uncertainty factor if the RfD or RfC is based on the Lowest-Observed Adverse Effect Level (LOAEL) instead of the NOAEL, or if data inadequacies are present (e.g., the experiment for which the RfD or RfC was derived had less than lifetime exposure). A modifying factor (MF) typically of 3 or so may also be included to address data sets lacking certain key studies. These factors are multiplied together and act as the denominator to the NOAEL or LOAEL in the calculation of the RfD or RfC as follows:

$$RfD/RfC = \frac{NOAEL\ or\ LOAEL}{UF_1 \times UF_2 \times UF_3 \ldots}$$

RfDs and RfCs are developed for the oral and the inhalation exposure pathways, respectively. These are an oral reference dose (RfDo) in mg/kg-day, and RfC in mg/m^3.

CRA used the non-cancer RfDs to estimate human health effects for oral and dermal exposure routes for the COPCs and are presented in Table B.5.1 of Appendix B. CRA adjusted the dermal RfDs consistent with USEPA (2004a). The RfCs used for the inhalation exposure route are presented in Table B.5.2 of Appendix B.

3.3.1.2 CARCINOGENIC RISKS

Cancer Slope Factors (CSFs) and Inhalation Unit Risk Factors (URFs) are quantitative risk estimates of carcinogenic potency. Slope factors and URFs relate the lifetime probability of excess cancers to the lifetime average exposure dose/concentration of a substance. CSFs and URFs are estimated using mathematical extrapolation models, most commonly the linearized multistage (LMS) model, and are presented as risk per mg/(kg-day) (i.e., mg carcinogen per kg body weight per day) for oral CSF and risk per mg/m^3 for inhalation URF. These models assume low dose-response linearity and thus may not be appropriate for some suspect carcinogens, in particular those that function as promoters. As well, the body's natural repair processes and defense mechanisms may decrease cancer risk at low exposures. Thus, the risks at lower exposures are likely overestimated using the LMS model.

When adequate human epidemiology data are available, maximum likelihood estimates (MLEs) of model parameters are used to generate a CSF or URF. When only animal data are available, the CSF or URF is derived from the largest possible linear slope that is consistent with the data (within the upper 95 percent confidence limit). In other words, the true risk to humans, while not identifiable, is not likely greater than the upper-bound estimate. This is a conservative estimate, and in some cases a linear slope of zero may be as appropriate for the data (i.e., no carcinogenic risk).

CRA evaluated and identified known or suspected human carcinogens using the USEPA Weight-of-Evidence approach for carcinogenicity classification. The USEPA classification is based on an evaluation of the likelihood that the agent is a human carcinogen. The evidence is characterized separately for human and animal studies as follows:

Group A - Known Human Carcinogen (sufficient evidence of carcinogenicity in humans)

Group B - Probable Human Carcinogen (B1 - limited evidence of carcinogenicity in humans; B2 - 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 human data)

Group D - Not Classifiable as to Human Carcinogenicity (inadequate or no evidence)

Group E - Evidence of Noncarcinogenicity for Humans (no evidence of carcinogenicity in animal studies)

CRA classified the COPCs using the USEPA system.

The following COPCs were considered not classifiable as human carcinogens: bromomethane, chlorobenzene, cis-1,2-dichloroethylene, isopropylbenzene, barium, copper, manganese, mercury, selenium, and zinc.

The following COPCs are considered to be (known, probable, or possible) carcinogens: 1,1-dichloroethane, 1,1-dichloroethylene, 1,2-dichloroethane, benzene, chloroform, dibromochloromethane, methylene chloride, vinyl chloride, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, arsenic, cadmium, lead, Aroclor-1248, Aroclor-1254, Aroclor-1260, dieldrin, heptachlor, and dioxins/furans (total TEQ).

No information is available regarding the carcinogenicity of the following COPCs: 1,4-dichlorobenzene, chloroethane, cyclohexane, dichlorodifluoromethane, ethylbenzene, methyl tert butyl ether, tetrachloroethylene, toluene, trans-1,2-dichloroethylene, trichloroethylene, trichlorofluoromethane, xylenes (total), 2-methylnaphthalene, aluminum, antimony, cobalt, iron, and vanadium.

CRA assessed carcinogenic COPCs based on non-carcinogenic effects where useable toxicity values were available.

The oral and dermal cancer toxicity data (CSFs) used in the HHRA to estimate the risk of cancer for the oral and dermal exposure routes are presented in Table B.6.1 of Appendix B. Dermal CSFs were adjusted consistent with USEPA (2004a). The URFs used for the inhalation exposure route are presented in Table B.6.2 of Appendix B.

3.3.2 POTENTIAL RISK FROM CARCINOGENS

CRA used a CSF or URF is applied to estimate the potential risk of cancer from exposure to carcinogenic chemicals. The CSF or URF, when multiplied by the lifetime average daily intake, provides an estimate of the probability that the intake will cause cancer during the lifetime of the exposed individual. This increased cancer risk is expressed, for example, as 1×10^{-6} or 1.0E-06 (one in one million increased cancer risk). This is an upper limit estimate of the risk, based on very conservative health-protective assumptions and conservative statistical evaluations of data from animal experiments or epidemiological studies. To state that a chemical exposure causes a 1E-06 added upper

limit risk of cancer means that if 1,000,000 people are exposed to this concentration of the chemical for their lifetimes, a maximum of one additional incident of cancer may occur. This is a very conservative estimate, and, in fact, there may be no additional cases of cancer due to the chemical exposure.

3.4 RISK CHARACTERIZATION

The objective of this risk characterization is to integrate information developed in the exposure assessment, for complete exposure pathways, for detected COPCs that may have exceeded screening levels, and the toxicity assessment into an evaluation of the potential human health risks associated with potentially completed exposures to potentially contaminated media. The methods used in this risk characterization were based on USEPA guidance for human exposures (USEPA, 1989a, 1991a, 1991b, 1995a, 1997a, 2001, 2002, 2004a, 2008a, and 2009a).

3.4.1 HAZARD ESTIMATES

The potential for non-cancer health effects from exposure to a COPC were evaluated by comparing an exposure level over a specified time period to a RfD for a similar time period. This ratio, termed the hazard quotient, is calculated according to the following general equation:

$$HQ = \frac{CDI}{RfD \text{ or } RfC}$$

where:

HQ = Hazard quotient (unitless), the ratio of the exposure dose of a chemical to a reference dose not expected to cause adverse effects from a lifetime exposure. A hazard quotient equal to or less than 1 is considered protective of human health.

CDI = Chronic daily intake, the chemical dose calculated by applying the exposure scenario assumptions and expressed as mg/(kg-day^{-1}). The intake represents the average daily chemical dose over the expected period of exposure.

RfD = Reference dose, a daily dose believed not to cause an adverse effect from even a lifetime exposure [mg/(kg-day^{-1})]. The RfD is based on experimental data and/or epidemiological studies.

RfC = the Reference Concentration is a daily concentration believed not to cause an adverse effect from even a lifetime exposure [mg/m^3]. The RfC is based on experimental data.

The Hazard Index (HI) for an exposure situation is the sum of the HQs estimated for the individual COPCs. An HI less than 1 is considered health protective for a lifetime exposure and is therefore not an exposure of concern. If the HI is greater than 1, it may be appropriate to reevaluate the toxicity of the individual COPCs to determine if individual chemicals have the same or differing toxicological endpoints that would support conclusions that the HQs should or should not be added.

CRA established non-cancer hazard estimates for children (6 years of exposure for both CT and RME) only for the off-Site resident receptors. For all adult receptors and trespassers, CRA evaluated the non-cancer hazard estimates for the CT and RME scenario based on the respective exposure durations.

3.4.2 CANCER RISK ESTIMATES

Exposure scenarios may involve potential exposure to more than one carcinogen. To represent the potential carcinogenic effects posed by exposure to multiple carcinogens, it is assumed, in the absence of information on synergistic or antagonistic effects, that these risks are additive. CRA calculated cancer risks utilizing the following general equation:

$$\textit{Cancer Risk} = LADD \times (CSF \text{ or } URF)$$

where:

Cancer Risk = Estimated upper bound on additional risk of cancer over a lifetime in an individual exposed to the carcinogen for a specified exposure period (unitless).

LADD = Lifetime average daily dose of the chemical calculated using exposure scenario assumptions and expressed in mg/(kg-day^{-1}). The intake represents the total lifetime chemical dose averaged over an individual expected lifetime of 70 years.

CSF = Cancer slope factor that models the potential carcinogenic response and is expressed as [mg/(kg-day^{-1})]$^{-1}$.

URF = the inhalation Unit Risk Factor models the potential carcinogenic response and is expressed as [mg/m^3]$^{-1}$.

For estimating cancer risks from exposure to multiple carcinogens from a single exposure route, CRA used the following equation:

$$Risk_T = \sum_{i=1}^{N} Risk_i$$

where:

$Risk_T$	=	Total cancer risk from route of exposure;
$Risk_i$	=	Cancer risk for the chemical; and
N	=	Number of chemicals.

Risk estimates were calculated for a combination of child (6 years) and adult (24 years) exposure for the residential and recreational user scenarios. CRA compared the potential cumulative risks resulting from exposure to the COPCs to USEPA's risk range of 1×10^{-6} to 1×10^{-4}.

3.4.3 QUANTIFICATION OF HEALTH RISKS

The risk characterization consists of quantifying the magnitude of exposure followed by the hazard quotient and cancer risk posed by all COPCs to the receptors, as discussed for each potential receptor below. Note that the text presents two values, CT and RME risks. The CT and RME non-carcinogenic hazards and carcinogenic risks are based on the use of current toxicity data. The hazard quotient and cancer risk posed by each COPC to each receptor are presented in Section 3.4.4 below.

3.4.4 QUANTITATIVE INTERPRETATION OF HEALTH RISKS

The non-cancer hazard calculations and calculated lifetime cancer risks for the trespasser, industrial/commercial worker, construction utility worker, and resident are summarized below.

As noted above, existing off-Site groundwater and soil vapor contamination will be assessed as part of the OU2 RI/FS. The OU1 BRA includes an assessment of risks to off-Site receptors from on-Site groundwater in order to identify risks posed by contaminant concentrations in shallow on-Site groundwater (i.e., OU1) that may be migrating off Site currently or may migrate off-Site in future. Any such risks will need to be addressed as part of the remedial alternatives assessed in the FS.

3.4.4.1 ON-SITE TRESPASSER

The risk/hazard calculations for each COPC identified for the on-Site trespasser exposure to ambient air (due to migration from soil gas), surface soil, and sediment are presented in Tables A.7.1.CT and A.7.1.RME of Appendix B, and summarized in Tables A.9.1.CT and A.9.1.RME of Appendix B. The calculated lifetime cancer risks and non-cancer hazards for the on-Site trespasser exposure to ambient air (from soil gas), surface soil, and sediment are summarized below.

Receptor	*Medium*	*Route*	*Exposure*	*Carcinogenic Risk*	*Risk >10⁻⁶*	*Risk >10⁻⁴*	*Non-Carcinogenic Hazard Index*	*HI >1*	*Table Reference*
Trespasser	Soil Gas to Ambient Air	Inhalation	CT	2.3E-08	No	No	3.3E-04	No	A.7.1.CT
			RME	9.3E-08	No	No	1.3E-03	No	A.7.1.RME
	Surface Soil	Ingestion, Dermal Contact, and Inhalation	CT	2.5E-06	Yes	No	4.6E-01	No	A.7.1.CT
			RME	6.7E-06	Yes	No	1.0E+00	No	A.7.1.RME
	Sediment	Ingestion and Dermal Contact	CT	1.0E-06	No	No	2.4E-02	No	A.7.1.CT
			RME	3.0E-06	Yes	No	7.2E-02	No	A.7.2.RME

As presented in the table above, the calculated HI was equal to or less than the target HI of 1 for the trespasser inhalation exposure to soil gas migrating to ambient air, and direct contact exposure to soil and sediment for both CT and RME scenarios.

The carcinogenic risks for the trespasser inhalation exposure to soil gas migrating to ambient air, and direct contact exposure to soil and sediment are within the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4} for both the CT and RME scenarios.

A summary of the cumulative risks/hazards for the on-Site trespasser is provided in Section 3.4.5.1. The major contributors to cumulative risks/hazards for the on-Site trespasser are presented in Section 3.4.7.1.

3.4.4.2 ON-SITE INDUSTRIAL/COMMERCIAL WORKER

The risk/hazard calculations for each COPC identified for the on-Site industrial/commercial worker exposure to indoor air (from soil gas), surface soil, and sediment are presented in Tables A.7.2.CT and A.7.2.RME of Appendix B, and

summarized in Tables A.9.2.CT and A.9.2.RME of Appendix B. The calculated lifetime cancer risks and non-cancer hazards for the on-Site industrial/commercial worker exposure to indoor air (from soil gas), ambient air (soil gas), surface soil, and sediment are summarized below.

Receptor	*Medium*	*Route*	*Exposure*	*Carcinogenic Risk*	*Risk >10⁻⁶*	*Risk >10⁻⁴*	*Non-Carcinogenic Hazard Index*	*HI >1*	*Table Reference*
On-Site Industrial/ Commercial Worker	Soil Gas to Indoor Air	Inhalation	CT	5.2E-06	Yes	No	1.6E-01	No	A.7.2.CT
			RME	1.7E-05	Yes	No	1.8E-01	No	A.7.2.RME
	Soil Gas to Ambient Air	Inhalation	CT	8.5E-07	No	No	1.4E-02	No	A.7.2.CT
			RME	2.7E-06	Yes	No	1.6E-02	No	A.7.2.RME
	Surface Soil	Ingestion, Dermal Contact, and Inhalation	CT	1.2E-05	Yes	No	2.5E+00	Yes	A.7.2.CT
			RME	5.1E-05	Yes	No	3.2E+00	Yes	A.7.2.RME
	Sediment	Ingestion and Dermal Contact	CT	4.8E-06	Yes	No	1.3E-01	No	A.7.2.CT
			RME	2.2E-05	Yes	No	2.1E-01	No	A.7.2.RME

As presented in the table above, the calculated HI was less than the target HI of 1 for the industrial/commercial worker inhalation exposure to soil gas migrating to indoor air, inhalation exposure to soil gas migrating to ambient air, and direct contact exposure to sediment for both CT and RME scenarios; however the calculated HI is greater than the target of 1 for the industrial/commercial worker direct contact exposure to surface soil for both CT and RME scenarios.

The carcinogenic risks for the industrial/commercial worker inhalation exposure to soil gas migrating to indoor air, inhalation exposure to soil gas migrating to ambient air, and direct contact exposure to sediment are within the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4} for both the CT and RME scenarios.

A summary of the cumulative risks/hazards for the on-Site industrial/commercial worker is provided in Section 3.4.5.2. The major contributors to cumulative risks/hazards for the on-Site industrial/commercial worker are presented in Section 3.4.7.2.

3.4.4.3 ON-SITE CONSTRUCTION/UTILITY WORKER

The risk/hazard calculations for each COPC identified for the construction/utility worker exposure to soil (surface and subsurface) through direct contact (incidental ingestion, dermal contact, and ambient air inhalation) and sediment through direct contact (incidental ingestion and dermal contact) are presented in Tables A.7.3.CT and A.7.3.RME of Appendix B, and summarized in Tables A.9.3.CT and A.9.3.RME of Appendix B. The calculated lifetime cancer risks and non-cancer hazards for the construction/utility worker exposure to soil and sediment are summarized below.

Receptor	*Medium*	*Route*	*Exposure*	*Carcinogenic Risk*	*Risk >10^{-6}*	*Risk >10^{-4}*	*Non-Carcinogenic Hazard Index*	*HI >1*	*Table Reference*
On-Site Construction/ Utility Worker	Soil Gas to Ambient Air	Inhalation	CT	1.4E-10	No	No	2.1E-05	No	A.7.3.CT
			RME	2.9E-10	No	No	4.1E-05	No	A.7.3.RME
	Surface and Subsurface Soil	Ingestion, Dermal Contact, and Inhalation	CT	6.8E-07	No	No	1.3E+00	Yes	A.7.3.CT
			RME	1.5E-06	Yes	No	2.8E+00	Yes	A.7.3.RME
	Sediment	Ingestion and Dermal Contact	CT	4.6E-07	No	No	1.2E-01	No	A.7.3.CT
			RME	9.4E-07	No	No	2.7E-01	No	A.7.3.RME

As presented in the above table, the calculated HI was less than the target HI of 1 for the construction/utility worker inhalation exposure to soil gas migrating to ambient air and direct contact exposure to sediment for both CT and RME scenarios; however, the calculated HI is greater than the target HI of 1 for the construction/utility worker direct contact exposure to soil for both CT and RME scenarios.

The carcinogenic risks for the construction/utility worker inhalation exposure to soil gas migrating to ambient air and direct contact exposure to soil and sediment are within the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4} for both the CT and RME scenarios.

A summary of the cumulative risks/hazards for the on-Site construction/utility worker is provided in Section 3.4.5.3. The major contributors to cumulative risks/hazards for the on-Site construction/utility worker are presented in Section 3.4.7.3.

3.4.4.4 OFF-SITE RESIDENT

The risk/hazard calculations for each COPC identified for the future off-Site resident exposure to indoor air (via volatilization through soil vapor from shallow on-Site groundwater) and through future off-Site household use of on-Site groundwater are presented in Tables A.7.4.CT and A.7.4.RME of Appendix B, and summarized in Tables A.9.4.CT and A.9.4.RME of Appendix B. The calculated lifetime cancer risks and non-cancer hazards for the off-Site resident exposure to groundwater are summarized below.

Receptor	*Medium*	*Route*	*Exposure*	*Carcinogenic Risk*	*Risk >10^{-6}*	*Risk >10^{-4}*	*Non-Carcinogenic Hazard Index*	*HI >1*	*Table Reference*
Off-Site Resident	On-Site Groundwater to Indoor Air	Inhalation	CT	1.8E-05	Yes	No	1.9E-01	No	A.7.4.CT
			RME	7.9E-05	Yes	No	2.5E-01	No	A.7.4.RME
	On-Site Groundwater (Household Use)	Ingestion, Dermal Contact, and Inhalation	CT	6.0E-04	Yes	Yes	7.7E+00	Yes	A.7.4.CT
			RME	1.9E-03	Yes	Yes	7.7E+00	Yes	A.7.4.RME

As presented in the table above, the calculated HI is less than the target HI of 1 for the off-Site resident inhalation of indoor air (from on-Site groundwater) for both CT and RME scenarios; however, the calculated HI are greater than the target HI of 1 for the off-Site resident direct contact exposure to on-Site groundwater for both CT and RME scenarios.

The carcinogenic risks for the off-Site resident inhalation exposure to indoor air are within the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4} for both the CT and RME scenarios; however use of the groundwater for potable purposes by the off-Site resident results in exposures that are outside the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4} for both the CT and RME scenarios.

A summary of the cumulative risks/hazards for the off-Site resident is provided in Section 3.4.5.4. The major contributors to cumulative risks/hazards for the off-Site resident are presented in Section 3.4.7.4.

3.4.4.5 OFF-SITE INDUSTRIAL/COMMERCIAL WORKER

The risk/hazard calculations for each COPC identified for the off-Site industrial/commercial worker exposure to indoor air (from shallow on-Site groundwater) through inhalation are presented in Tables A.7.5.CT and A.7.5.RME of Appendix B, and summarized in Tables A.9.5.CT and A.9.5.RME of Appendix B. The calculated lifetime cancer risks and non-cancer hazards for the off-Site industrial/commercial worker exposure to indoor air (from on-Site groundwater) are summarized below.

Receptor	*Medium*	*Route*	*Exposure*	*Carcinogenic Risk*	*Risk >10^{-6}*	*Risk >10^{-4}*	*Non-Carcinogenic Hazard Index*	*HI >1.0*	*Table Reference*
Off-Site Industrial/ Commercial Worker	On-Site Groundwater to Indoor Air	Inhalation	CT	1.2E-06	Yes	No	1.2E-02	No	A.7.5.CT
			RME	3.7E-06	Yes	No	1.4E-02	No	A.7.5.RME

As presented in the table above, the calculated HI is less than the target HI of 1 for the off-Site industrial/commercial worker inhalation exposure to COPCs in on-Site groundwater volatilizing and migrating to indoor air.

The carcinogenic risks for the off-Site industrial/commercial worker inhalation exposure to on-Site groundwater COPCs migrating to indoor air are within the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4} for both the CT and RME scenarios.

A summary of the cumulative risks/hazards for the off-Site industrial/commercial worker is provided in Section 3.4.5.5. The major contributors to cumulative risks/hazards for the off-Site industrial/commercial worker are presented in Section 3.4.7.5.

3.4.5 SUMMATION OF RISKS

A given human population may be exposed to a chemical by several exposure routes and through more than one medium. The purpose of this section is to identify the risks associated with a population that may be exposed to Site COPCs through a combination of exposure pathways.

USEPA (1989a) states that risks should be combined across exposure pathways only where the following situation occurs:

a) reasonable exposure pathway combinations are identified

b) it appears likely that the <u>same</u> individuals would <u>consistently</u> face the "reasonable maximum exposure" (RME) through more than one pathway

Instead of encouraging the calculation of combined risks from across exposure pathways, USEPA (1989a) cautions that each RME estimate includes many conservative assumptions and that combining estimates is not appropriate unless the combination itself is a RME:

> ***For real world situations in which contaminant concentrations vary over time and space, the same individual may or may not experience the RME for more than one pathway over the same period of time. One individual might face the RME through one pathway, and a different individual face the RME through a different pathway. <u>Only if you can explain why the key RME assumptions for more than one pathway apply to the same individual or sub-population should the RME risks for more than one pathway be combined.</u>***
>
> ***In some situations, it may be appropriate to combine one pathway's RME risks with other pathways' risk estimates that have been derived <u>from more typical exposure</u> parameter values.*** [Emphasis added]

It is improbable that the same person would experience all potential exposures associated with the Site or even over the periods of years specified in the individual RME scenarios. The HHRA examined the potential for unique receptors chosen to represent potential activities that might occur within the on- and off-Site locations. The purpose of differentiating between receptors is that each of the receptors has a realistic exposure that depends on the activities they perform. These activities are receptor specific and are unlikely to overlap. As a result, CRA determined that it is inappropriate to add together the estimated risks and hazards for the different exposure routes and pathways, because this would result in the exaggeration of an appropriate RME for the summed exposures. It is unlikely that the individual RME estimates would result in an underestimation of risk, and CRA has concluded that the individual RME estimate should be evaluated as a conservative estimate of the likely exposure to COPCs at the Site. The summation of the CT estimates is likely the more appropriate representation of a cumulative maximum exposure. However, where appropriate and for completeness,

CRA combined both the RME and cumulative CT risks and hazards from separate exposure routes and media to estimate total CT and RME exposures.

The cumulative HIs and lifetime cancer risks across all applicable exposure media for trespassers, industrial/commercial workers, construction/utility workers, and residents are summarized below.

3.4.5.1 TRESPASSERS

The cumulative lifetime cancer risks and HIs across all applicable exposure routes for trespasser receptors are summarized in the table below.

Receptor	*Media*	*Exposure*	*Cumulative Carcinogenic Risk*	*Risk* $>10^{-6}$	*Risk* $>10^{-4}$	*Cumulative Non-Carcinogenic Hazard Index*	*HI >1*	*Appendix Table Reference*
Trespasser (Current/ Future)	Soil gas to Ambient Air, Soil, and Sediment	CT	3.6E-06	Yes	No	4.8E-01	No	A.9.1.CT
		RME	9.8E-06	Yes	No	1.1E+00	Yes	A.9.1.RME

3.4.5.2 INDUSTRIAL/COMMERCIAL WORKERS

The cumulative lifetime cancer risks and HIs across all applicable exposure routes for on-Site industrial/commercial worker receptors are summarized in the table below.

Receptor	*Media*	*Exposure*	*Cumulative Carcinogenic Risk*	*Risk* $>10^{-6}$	*Risk* $>10^{-4}$	*Cumulative Non-Carcinogenic Hazard Index*	*HI >1*	*Appendix Table Reference*
On-Site Industrial/ Commercial Worker (Current/ Future)	Soil Gas to Indoor Air, Soil Gas to Ambient Air, Soil, and Sediment	CT	2.3E-05	Yes	No	2.8E+00	Yes	A.9.2.CT
		RME	9.2E-05	Yes	No	3.6E+00	Yes	A.9.2.RME

3.4.5.3 CONSTRUCTION/UTILITY WORKERS

The cumulative lifetime cancer risks and HIs across all applicable exposure routes for construction/utility worker receptors are summarized in the table below.

Receptor	*Media*	*Exposure*	*Cumulative Carcinogenic Risk*	*Risk >10^{-6}*	*Risk >10^{-4}*	*Cumulative Non-Carcinogenic Hazard Index*	*HI >1*	*Appendix Table Reference*
Construction/ Utility Worker (Future)	Soil Gas to Ambient Air, Soil, and Sediment	CT	1.1E-06	Yes	No	1.5E+00	Yes	A.9.3.CT
		RME	2.5E-06	Yes	No	3.1E+00	Yes	A.9.3.RME

3.4.5.4 OFF-SITE RESIDENT

The cumulative lifetime cancer risks and HIs across all applicable exposure routes for off-Site resident receptors are summarized in the table below.

Receptor	*Media*	*Exposure*	*Cumulative Carcinogenic Risk*	*Risk >10^{-6}*	*Risk >10^{-4}*	*Cumulative Non-Carcinogenic Hazard Index*	*HI >1*	*Appendix Table Reference*
Off-Site Resident (Future)	Groundwater to Indoor Air and Groundwater for Household Use	CT	6.1E-04	Yes	Yes	7.9E+00	Yes	A.9.4.CT
		RME	2.0E-03	Yes	Yes	7.9E+00	Yes	A.9.4.RME

3.4.5.5 OFF-SITE INDUSTRIAL/COMMERCIAL WORKER

The cumulative lifetime cancer risks and HIs across all applicable exposure routes for off-Site industrial/commercial worker receptors are summarized in the table below.

Receptor	*Medium*	*Exposure*	*Cumulative Carcinogenic Risk*	*Risk >10^{-6}*	*Risk >10^{-4}*	*Cumulative Non-Carcinogenic Hazard Index*	*HI >1*	*Appendix Table Reference*
Off-Site Industrial/ Commercial Worker (Future)	Groundwater to Indoor Air	CT	1.2E-06	Yes	No	1.2E-02	No	A.9.5.CT
		RME	3.7E-06	Yes	No	1.4E-02	No	A.9.5.RME

3.4.6 SUMMARY OF EXCEEDANCES

The table below summarizes the instances where the calculated risk was outside the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4} or the calculated HI was greater than the target HI of 1 for the media and receptors assessed.

Primary Media	*Receptor*	*Excess Cancer Risk>10^{-4}* (1)	*> Target HI =1* (1)
		RME	*RME*
Ambient Air (from Soil Gas)	Trespasser	No	No
Surface Soil	Trespasser	No	No
Sediment	Trespasser	No	No
Ambient Air (from Soil Gas)	On-Site Industrial/Commercial Worker	No	No
Indoor Air (from Soil Gas)	On-Site Industrial/Commercial Worker	No	No
Surface Soil	On-Site Industrial/Commercial Worker	No	Yes
Sediment	On-Site Industrial/Commercial Worker	No	No
Ambient Air (from Soil Gas)	Construction/Utility Worker	No	No
Surface and Subsurface Soil	Construction/Utility Worker	No	Yes
Sediment	Construction/Utility Worker	No	No
Indoor Air (from On-Site Groundwater)	Off-Site Resident	No	No
On-Site Groundwater (Potable)	Off-Site Resident	Yes	Yes
Indoor Air (from On-Site Groundwater)	Off-Site Industrial/Commercial Worker	No	No

(1) "Yes" or "No" indicates that the cumulative HI and/or cancer risk is greater than the cancer risk range of 1×10^{-6} to 1×10^{-4} or target HI of 1.

3.4.7 RISK AND HAZARD COPC CONTRIBUTIONS

The contribution to total risk and hazard of each COPC for a specific combined exposure scenario varies, depending on the COPC exposure point concentration and relative toxicity. Frequently, most of the risk estimated for an exposure scenario can be attributed to a few COPCs. The following sub-sections present a summary of the COPCs contributing the majority of risk and/or hazard in Site media where the combined RME scenarios exceeded the risk and hazard target levels.

The COPCs contributing the majority of RME risk and/or hazard at the Site in the applicable exposure media for the trespasser, on-Site industrial/commercial worker, construction/utility worker, off-Site resident, and off-Site industrial/commercial worker are summarized below.

For a COPC to be considered a major contributor, the cumulative risk/hazard for the receptor must be a minimum of 5 percent of the cumulative risk/hazard.

The summary tables presented in the following subsections list the contributing COPCs along with their risk or hazard value as well as the contributing exposure route. Also

presented in the summary tables are the total risk or hazard associated with these contributing COPCs and the total cumulative risk or hazard associated with all COPCs identified in all exposure media. The percentage that these contributing COPCs contribute to the total cumulative risk or hazard is also presented in the text in each section below.

3.4.7.1 TRESPASSER

Medium	*Contributing COPC*	*Exposure Route*	*Risk*	*HI*	*Table Reference*
Surface Soil	Arsenic	Ingestion and Dermal	-	6.5E-02	A.10.1.RME
	Copper	Ingestion and Dermal	-	7.9E-01	
Total RME Risk/Hazard of Contributing COPCs			9.5E-06	8.6E-01	
Percentage of Cumulative RME Risk/Hazard			-	~78 %	
Cumulative RME Risk/Hazard Across all Media			9.8E-06	1.1E+00	A.9.1.RME

As presented in the above table, the cumulative risk for the trespasser is within the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4}, and therefore no COPCs have been identified as major contributors to cumulative risk.

The RME cumulative HI of 1.1 primarily results from ingestion and dermal contact exposure to arsenic and copper in surface soil. Arsenic and copper in surface soil account for approximately 78 percent of the cumulative HI. However, as the HI for arsenic and copper are less than the target HI of 1, there is no concern regarding potential trespasser exposure to arsenic and copper in surface soil.

3.4.7.2 INDUSTRIAL/COMMERCIAL WORKER

Medium	*Contributing COPC*	*Exposure Route*	*Risk*	*HI*	*Table Reference*
Surface Soil	Arsenic	Ingestion and Dermal	-	2.0E-01	A.10.2.RME
	Copper	Ingestion and Dermal	-	2.5E+00	
Total RME Risk/Hazard of Contributing COPCs			-	2.7E+00	
Percentage of Cumulative RME Risk/Hazard			-	~75%	
Cumulative RME Risk/Hazard Across all Media			9.2E-05	3.6E+00	A.9.2.RME

As presented in the above table, the cumulative risk for the industrial/commercial worker is within the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4}, and therefore no COPCs have been identified as major contributors to cumulative risk.

The RME cumulative HI of 3.6 primarily results from ingestion and dermal contact exposure to arsenic and copper in surface soil. Arsenic and copper in surface soil accounts for approximately 75 percent of the cumulative HI. Of these, only copper has an HI greater than the target HI of 1. Therefore, there is no concern regarding potential industrial/commercial worker exposure to arsenic in surface soil. For copper, the maximum detected concentration of 191,000 mg/kg was in the sample collected from S10, adjacent to the former ACD. This result skews the data distribution and therefore impacting the method used to calculate the copper EPC of 95,324 mg/kg in surface soil (see Table B.3.4 of Appendix B) used in the hazard calculation. The next greatest copper concentration in surface soil was 2,220 mg/kg from the soil sample collected from S3, which was significantly less than the EPC and indicates that the maximum concentration has significantly impacted the EPC calculation. Removal of soil from the vicinity of location S10 would likely reduce the industrial/commercial worker hazard less than the target hazard of 1.

3.4.7.3 CONSTRUCTION/UTILITY WORKER

Media	*Contributing COPC*	*Exposure Route*	*Risk*	*HQ/HI*	*Table Reference*
Surface and Subsurface Soil	Antimony	Ingestion and Dermal	-	3.9E-01	A.10.3.RME
	Cobalt	Ingestion and Dermal	-	2.1E-01	
	Copper	Ingestion and Dermal	-	1.2E+00	
	Manganese	Inhalation	-	1.8E-01	
	Mercury	Inhalation	-	2.4E-01	
	Aroclor-1254	Ingestion and Dermal	-	2.0E-01	
Total RME Risk/Hazard of Contributing COPCs			-	2.4E+00	
Percentage of Cumulative RME Risk/Hazard			-	~77%	
Cumulative RME Risk/Hazard Across all Media			2.5E-06	3.1E+00	A.9.3.RME

As presented in the above table, the cumulative risk for the construction/utility worker is within the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4}, and therefore no COPCs have been identified as major contributors to cumulative risk.

The RME cumulative HI of 3.1 primarily results from ingestion and dermal contact exposure to antimony, cobalt, copper, and Aroclor-1254, and inhalation exposure to manganese and mercury in surface soil. Antimony, cobalt, copper, manganese, mercury, and Aroclor-1254 in surface soil accounts for approximately 77 percent of the cumulative HI. Of these, only copper has an HI greater than the target HI of 1. Therefore, there is no concern regarding potential construction/utility worker exposure to antimony, cobalt, manganese, mercury, and Aroclor-1254 in surface and subsurface soil. For copper, the results for two sampling locations (S10, 191,000 mg/kg and TT4, 43,400 mg/kg) skew the data distribution and therefore impact the method used to

calculate the copper EPC of 29,658 mg/kg (see Table B.3.5 of Appendix B) in surface and subsurface soil used in the hazard calculation. The next greatest copper concentration in surface and subsurface soil was 24,900 mg/kg in the soil sample collected from TT21, which was less than the EPC and indicates that the S10 and TT4 results will not impact the EPC calculation. Removal of soil from the vicinity of locations S10 and TT4 would likely reduce the construction/utility worker hazard to less than the target hazard of 1. Metals concentrations may also be due, in part, to background metals concentrations in native soils. The following discussion uses arsenic as an example.

CRA completed an assessment of background arsenic concentrations for the Valleycrest Landfill Superfund Site (Valleycrest Site) approximately seven miles to the north of the Site. The site-specific background arsenic concentration (95 percent upper confidence limit) for the Valleycrest Site was 19 mg/kg, which is greater than the Residential and Industrial RSLs for arsenic of 0.39 and 1.6 mg/kg, respectively.

Cox-Colvin & Associates analyzed state-wide background metals concentrations for Ohio EPA in 1996 using available data from the Ohio EPA, including data from Montgomery County, where the Site is located. The state-wide geometric mean background arsenic concentration reported by Cox-Colvin was 5.72 mg/kg and the range of background concentrations was from 0.5 to 56 mg/kg.

Based on these background concentrations a number of the detections of arsenic would appear to be due to background concentrations of arsenic; however, several of the detections of arsenic at higher concentrations would appear to be due to anthropogenic sources.

The completion of a background metals study would assist in identifying those risks due to the presence of waste and soil contamination at the Site.

3.4.7.4 OFF-SITE RESIDENT

Medium	*Contributing COPC*	*Exposure Route*	*Risk*	*HQ*	*Table Reference*
On-Site Groundwater	cis-1,2-Dichloroethylene	Ingestion	-	6.1E-01	A.10.4.RME
	Vinyl Chloride	Ingestion	2.3E-04	4.3E-01	
	Arsenic	Ingestion	3.1E-04	3.0E+00	
	Cobalt	Ingestion	-	1.3E+00	
	Manganese	Ingestion	-	1.0E+00	
	Aroclor-1260	Dermal	1.3E-03	-	
Total RME Risk/Hazard of Contributing COPCs			1.8E-03	6.3E+00	
Percentage of Cumulative RME Risk/Hazard			~92%	~80%	
Cumulative RME Risk/Hazard Across all Media			2.0E-03	7.9E+00	A.9.4.RME

The RME cumulative risk of 2.0E-03 primarily results from ingestion exposure to vinyl chloride and arsenic, and dermal exposure to Aroclor-1260 in on-Site groundwater. Vinyl chloride, arsenic, and Aroclor-1260 account for 92 percent of the cumulative risk.

The RME cumulative HI of 7.9 primarily results from ingestion exposure to cis-1,2-dichloroethylene, vinyl chloride, arsenic, cobalt, and manganese in on-Site groundwater. cis-1,2-dichloroethylene, vinyl chloride, arsenic, cobalt, and manganese account for 80 percent of the cumulative HI. Of these, only arsenic, cobalt, and manganese have an HI greater than the target HI of 1. Therefore, there is no concern regarding potential off-Site resident exposure to cis-1,2-dichloroethylene and vinyl chloride in on-Site groundwater in terms of non-cancer hazards.

For vinyl chloride, the groundwater concentrations contributing the majority of the risk for the off-Site resident include water quality data for groundwater samples from locations MW-101A (up to 180 µg/L), VAS-9 (up to 760 µg/L), VAS-14 (up to 120 µg/L), and VAS-19 (up to 150 µg/L).

For arsenic, the groundwater concentrations contributing the majority of the risk/hazard for the off-Site resident include water quality data for groundwater samples from locations MW-103 (up to 33.4 µg/L), MW-209 (up to 32 µg/L), and P-211 (47.6 µg/L).

For cobalt, the groundwater concentrations contributing the majority of the hazard for the off-Site resident include water quality data for groundwater samples from locations MW-101A (up to 12.3 µg/L) and P-211 (6.5 µg/L). It should also be noted that several non-detected samples had detection limits of 50 µg/L, which are well above the EPC calculated for cobalt.

For manganese, the groundwater concentrations contributing the majority of the hazard for the off-Site resident include water quality data for groundwater samples from locations MW-101A (up to 1,000 µg/L), MW-203 (up to 789 µg/L), MW-207 (up to 1,080 µg/L), MW-208 (639 µg/L), MW-210 (635 - 661 µg/L), and MW-217 (1,060 µg/L).

As noted above, metals concentrations may also be due, in part, to background metals concentrations in native soils and groundwater. The completion of a background metals study would assist in identifying those risks due to the presence of waste and soil contamination at the Site.

For Aroclor-1260, the groundwater concentrations contributing the majority of the risk for the off-Site resident include sampling locations MW-202 (0.16 µg/L) and MW-204

(0.19 µg/L). It should also be noted that several non-detected samples had detection limits of 0.2 µg/L, the same concentration used as the EPC for Aroclor-1260 and resulting in unacceptable cancer risks.

CRA used a conservative analysis to evaluate this exposure pathway for off-Site residents, in particular those located adjacent to the southeast corner of the Site in close proximity to the location containing a potable well still in use, according to USEPA. Most of the water quality data indicated above as contributing the majority of the risks/hazards are located a significant distance away from these residents and in areas where the groundwater is most probably moving toward the GMR, and away from these residents. However, due to the absence of groundwater data at the southeastern corner of the Site, there is some uncertainty with regards to the groundwater quality in proximity to these residents.

Additional investigation during OU1 RD and the OU2 RI will resolve the uncertainty associated with the potential for contaminants in on-Site and off-Site groundwater, respectively, to impact off-Site receptors.

3.4.7.5 OFF-SITE INDUSTRIAL/COMMERCIAL WORKER

As presented in Table B.9.5.RME, the cumulative risk for the off-Site industrial/commercial worker is within the USEPA acceptable risk range of 1×10^{-6} to 1×10^{-4}, and therefore no COPCs have been identified as major contributors to cumulative risk.

3.4.8 HAZARD ASSESSMENT FOR LEAD EXPOSURE

Lead was identified as a COPC in Site soil and groundwater. The pathways considered complete for exposure to lead were the industrial/commercial worker direct contact exposure to surface soil, the construction/utility worker direct contact exposure to surface and subsurface soil, and the off-Site resident direct contact exposure to groundwater. Lead exposure was not evaluated for the trespasser, as their exposure frequencies would be less than the lowest exposure frequency of 60 days per year used in the adult lead model. As the depth to groundwater at the Site is greater than the depth of typical excavations by construction/utility workers, CRA did not evaluate exposure to lead in on-Site shallow groundwater for the construction/utility worker or industrial/commercial worker. CRA did not complete the evaluation of the potential exposure of the off-Site child resident to lead in soil as this assessment is outside the

scope of the OU1 RI/FS and will be addressed during the OU2 RI/FS[11]. As a result, CRA used the default IEUBK Model soil lead concentration of 200 mg/kg. CRA used the RME surface soil lead concentration of 991 μg/g, the RME surface and subsurface soil lead concentration of 1,105 μg/g, and the arithmetic mean groundwater lead concentration of 3.24 μg/L in the lead modeling.

Adult Lead Model – Industrial/Commercial Worker and Construction/Utility Worker

The estimated 95th percentile for fetal blood levels for a current/future female adult industrial/commercial worker exposure to lead in surface soil and future female adult construction/utility worker exposure to lead in surface and subsurface soil, as presented in Table E.1, are 16.1 μg/dL and 43.9 μg/dL, respectively. These blood lead concentrations indicate that soil lead exposure may pose an unacceptable hazard for the industrial/commercial worker and construction/utility worker.

IEUBK Lead Model – Off-Site Resident

The results from the IEUBK model run are presented in Appendix E along with the probability plots for blood lead concentrations. Using model inputs as presented in Table E.2 of Appendix E and described above in Section 3.2.3.3.2, the IEUBK Model predicts less than 5 percent of the children resident near the Site would have blood lead concentrations of 10 μg/dL or greater. As less than 5 percent of the child resident population would have a blood lead concentrations greater than 10 μg/dL, groundwater lead exposure does not pose an unacceptable hazard for the off-Site resident.

3.5 UNCERTAINTY ANALYSIS

The purpose of this section is to provide a summary and discussion regarding the uncertainties associated with the HHRA evaluation. The various uncertainties are discussed below in the following sections.

3.5.1 SAMPLING PROCEDURE BIAS

The sampling strategy is a factor that impacts the health evaluation for chemicals at the Site. Often in the sampling procedures, samples are collected from locations that are

11 Off-Site soil is outside the scope of Operable Unit 1 (OU1) and within the scope of Operable Unit 2 (OU2). As such, risks associated with exposure to off-Site soil will be evaluated during the BRA for OU2.

visibly contaminated or where contamination would be expected and not from areas of the Site that are potentially uncontaminated. This creates a sampling bias toward worst-case (higher) exposure point concentrations in the media sampled. The utilization of such biased data in the HHRA increases the conservative or health-protective nature of the health risk and hazard assessment.

The data used to estimate CT and RME scenarios for the Site were primarily collected in a biased manner. The media samples were collected from areas of known or suspected contamination, and should represent COPC concentrations at the higher end of the range for the Site. Sampling rounds usually focused on additional characterization and delineation of the more heavily contaminated areas, thus introducing a high bias in both CT and RME scenarios. Consistent with USEPA guidance (USEPA, 1989a), which states that the risk assessment process should use upper bound average concentrations when estimating risk, the HHRA used the 95% UCL concentration for each COPC, or the maximum when estimating risks. This would have the effect of decreasing the uncertainty that a conservative measure of the mean was used in the HHRA.

3.5.2 DATA QUALITY AND DATA QUALITY OBJECTIVES

A Quality Assurance/Quality Control (QA/QC) program was implemented during the investigative activities conducted by CRA to ensure that data of appropriate quality for use in the BRA and FS were generated. Following receipt of the analytical data from the laboratory, data quality assessments and validations were performed by a CRA certified chemist. The evaluation of the initial analytical data was based on QA/QC information provided by the laboratory including laboratory blank data, laboratory duplicate data, and laboratory surrogate spike and check recovery data. Based on the results of the data quality assessment and validation, the analytical data are suitable for use in the BRA. Data validation memoranda are provided in Appendices C and H of the OU1 RI Report.

As indicated in Section 1.1, the BRA used all the available data collected at the Site to more completely characterize the risks posed by the Site. CRA notes that the validity of some of the historical data cannot be verified as information regarding sample collection and QA/QC procedures do not exist. However, CRA has used these data to supplement the data collected by CRA, which were collected in accordance with the USEPA-approved draft Field Sampling Plan and QAPP. The chemical concentrations in the historical data are similar to concentrations in samples collected by CRA, which provides some confidence in the reliability of the historical data. The historical data serve to provide a more complete understanding of Site conditions and, for this reason,

were included in the BRA. Therefore, this type of uncertainty does not affect the results or conclusions of the BRA.

As indicated in Section 2.0, multiple sampling programs have been conducted at the Site. Based on the analytical data that has been collected, there has been an extensive amount of surface soil, subsurface soil, and soil gas data collected at the Site to characterize the impacts at the Site and support the HHRA. Therefore, there is minimal uncertainty associated with defining the nature and extent of impacts within Site surface soil, subsurface soil, and soil gas and evaluating the risks/hazards.

Although an extensive amount of groundwater data exists that fully characterizes the heavily contaminated areas of the Site, groundwater quality data is lacking at the southeastern portion of the Site, adjacent to the off-Site residents. As a result, there is some uncertainty with respect to the risks/hazards determined for the off-Site resident exposure to potable water. Further investigation should be aimed toward characterizing the groundwater quality at the southeastern portion of the Site.

Groundwater VOC data obtained from the VAS was included in the HHRA. It is recognized that data obtained from this type of sampling is used primarily for screening purposes and not typically used in evaluating human health risks/hazards. However, given that the concentrations of VOCs, in particular those that are considered to be major contributors to risk, detected within groundwater collected from the VAS were higher compared to those collected from the permanent monitoring wells, the inclusion of the VAS groundwater data in the HHRA resulted in a conservative estimate of risk.

Based on currently available data, there was sufficient quantity and quality data to calculate exposure point concentrations for soil, groundwater, and soil gas for the purposes of calculating baseline risks/hazards and identifying key exposure pathways that require further assessment. There is uncertainty with respect to the evaluation of risk/hazards associated with exposure to sediment and surface water from the Quarry Pond. The sediment data that CRA used in the HHRA was collected in 1996, 1999, and 2000, and included eight samples for VOCs and two samples for SVOCs, metals, PCBs, and pesticides analyses. The surface water data that CRA used in the HHRA was collected in 1999 and 2000, and included six samples for VOCs analyses. Therefore, the surface water and sediment data are considered dated, especially for VOCs where the data are not representative of current conditions. Further investigations should be aimed toward updating the sediment and surface water quality data at Quarry Pond.

3.5.3 EXPOSURE POINT CONCENTRATION ESTIMATES

Exposure point concentrations were estimated using USEPA methods. For media that were sampled directly, the uncertainty in the data is governed by sampling and analysis protocols and the statistical reduction of these data. The maximum or 95% UCL of the data was used in the risk assessment. These are conservative measures of the average, as defined by USEPA in their definition of the RME.

Exposure point concentrations for media that were not measured directly will have more uncertainty because they have been estimated using modeling. The uncertainty in the estimation of COPC concentration of media such as outdoor air and indoor air is different for each model. CRA used USEPA-approved models to estimate these media concentrations, and although there is uncertainty, the overall effect on the risk assessment is generally to overestimate media concentrations as a conservative method of evaluation. Exposure point concentrations for the modeled ambient air were based on the maximum ground level concentration. This exposure point concentration was assumed to be the same over the entire area of the Site when in fact the maximum ground level concentration occurred on the property boundary of the Site. Therefore, the exposure based on the ambient air modeling will result in an overestimation of the risks and hazards.

COPC concentrations were assumed to remain constant over the exposure duration assumed in the risk assessment. COPC concentrations could either increase or decrease over this time.

3.5.4 EXPOSURE SCENARIO ASSUMPTIONS

This section discusses the uncertainty associated with the primary exposure scenario assumptions such as land use and frequency of exposure. Because the exposure scenarios are often not based on actual exposure data, but rather on assumptions about future exposure patterns, the analysis requires the use of professional judgment. USEPA has compiled data on exposure patterns over time and the exposure values used in the HHRA are considered conservative in nature.

The HHRA attempts to estimate the potential point exposures for both the "average" [CT or Mean] and the RME scenarios. In order to accomplish this goal, where available and applicable, CRA used a series of standardized USEPA exposure assumptions. In the absence of available or applicable exposure assumptions, CRA used its professional judgment to establish the necessary assumptions protective of human health. The CT

exposure scenario represents an "average" exposure scenario that is reasonably expected to occur. The RME scenario represents the "reasonable maximum" exposure expected to occur. The exposure scenarios (CT and RME) were developed to evaluate possible risk under both current and future land use conditions. For the CT exposure scenarios, the CT EPC was the same as the RME EPC rather than the average or mean value for all exposure media. This will result in an overestimation of the risks and hazards for the CT exposure scenarios.

The major uncertainties regarding the physical exposure scenarios used in the HHRA are summarized as follows:

i) Because of limited data or data distribution in some instances, the maximum reported values (for RME) have been used as exposure point concentrations to estimate exposures. Although the use of maximum values is generally recognized as an appropriate conservative screening approach, it should be recognized that this procedure results in overestimation of the actual exposure by orders of magnitude, particularly where the maximum value may be an outlier or indication of a localized "hot spot" and not indicative of overall Site conditions. Use of maximum detected COPC concentrations in other exposure scenarios leads to similar overestimates.

ii) Long-term exposure point concentrations are inherently uncertain because COPC concentrations are assumed to remain constant over time. The assumptions that the measured concentrations are equivalent during sampling and exposure over the duration of exposure results in an overestimation of both intake and resulting risk.

iii) For most COPCs, the HHRA assumed that 100 percent absorption occurs after oral ingestion. Actual absorption rates of ingested contaminants vary based on numerous factors including individual COPC absorption rates. Thus, the assumption of 100 percent absorption of ingested COPCs overestimates the associated risks.

iv) For most COPCs, the HHRA assumed that 100 percent absorption occurs after inhalation. Actual lung absorption rates vary based on numerous factors including the individual COPC absorption rates. Thus, the assumption of 100% lung absorption of COPCs overestimates the associated risks.

3.5.5 DOSE RESPONSE

One of the major uncertainties in estimating Site-specific risk is the application of published toxicity information. Factors introducing uncertainty associated with toxicity value application are as follows:

i) Applicability of animal toxicity data - chemicals may be assumed to be human carcinogens based on animal studies even when there is limited or no available evidence that the chemical is a human carcinogen.

ii) Differences in chemical concentrations - CSFs are derived from high concentration animal studies and therefore may not be applicable to low concentration exposures.

iii) In general, assumptions in toxicity values - CSFs are developed in a conservative manner, so there is uncertainty in the outcome. Often USEPA will include uncertainty factors to account for this uncertainty in the extrapolation from animal exposure to human outcome.

iv) Assumptions in toxicity values (non-carcinogenic hazard) - RfDs are also established with uncertainty safety factors when extrapolating to human outcomes.

3.5.6 THEORETICAL NATURE OF RISK ESTIMATES

A human health risk assessment assigns a numerical value to the excess probability (above background cancer rates) of a case of cancer developing in a population exposed to a specified amount of chemical that is a known or suspected carcinogen. This numeric value is presented as an upper limit excess cancer risk such as 1.0E-06, or one additional cancer case in a population of one million people exposed to the chemical and at the specific chemical concentration for their entire lifetime, which is assumed to be 70 years. The model that is applied to calculate this numerical risk value is intentionally biased to give a high value, although the true value would be lower. The Cancer Risk Model and the assumptions used to estimate exposure are protective of the most sensitive populations. The true risk is expected to be lower than that calculated, and may quite reasonably approach zero. Thus risk estimates are overestimated by the HHRA methodology itself.

3.5.7 SYNERGISTIC, ADDITIVE, AND ANTAGONISTIC EFFECTS

Receptor exposure to a mixture of chemicals can in some cases lead to synergistic, additive, or antagonistic health effects. Synergistic effects occur when chemicals interact in the receptor and cause an effect significantly greater than the sum of the effects of the individual chemicals. There is no apparent scientific basis to suspect that the COPCs identified at the Site will have synergistic effects. Potential synergistic effects were not evaluated in the HHRA, and thus if such effects do occur with these COPCs, it may result in an underestimation of the calculated risks and hazards. Alternatively, chemicals may interact in the receptor in such a way as to cause an overall effect that is less than the sum of effects of the individual chemicals. These potential antagonistic effects were not evaluated in the HHRA, and thus, if such effects do occur with these COPCs, it may result in an overestimation of the calculated risks and hazards.

CRA assumed that carcinogenic and non-carcinogenic effects in the HHRA were additive, such that individual chemical cancer risks and non-carcinogenic hazards were added to obtain a total risk and hazard estimate. All compounds were treated as if each could affect the receptor in a similar manner although where each COPC has a different mode of action, then presumably the resulting risks would be non-additive. For a conservative assessment, the potential carcinogenic risk and non-carcinogenic hazard ratios for each COPC were added to yield a total risk or hazard. Although the carcinogenic risks and non-carcinogenic hazards for individual chemicals were aggregated, there is no basis to suspect the toxic effects are additive. This suggests that the total calculated risks and hazards estimated for the potential Site receptors may be higher than will actually occur.

4.0 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT (SLERA)

This screening level ecological risk assessment (SLERA) evaluates the potential risks to ecological receptors, from materials released or disposed of at the Site, in Moraine, Ohio. Ecological risk assessment is intended to provide risk managers with information sufficient to determine whether remedial actions are necessary to protect the environment from toxic chemicals or other hazards at a Site. The SLERA is the first step in what may evolve to be a multi-step ecological risk assessment process.

This SLERA relied on background information and data collected in several previous investigations, by USEPA, Ohio Environmental Protection Agency (Ohio EPA), and CRA. As part of those investigations, samples of surface soil, sediments, surface water, and groundwater were collected and analyzed for a variety of chemicals. Locations of those samples are depicted in Figure 2.2 (surface soil), Figure 2.3 (groundwater), and Figure 2.4 (sediment and surface water). In general, samples were analyzed for metals, VOCs, SVOCs, pesticides and PCBs. Information on previous sampling programs and sampling locations is provided in the OU1 RI Report.

4.1 OVERVIEW OF THE ECOLOGICAL RISK ASSESSMENT PROCESS

This SLERA follows USEPA guidance. As described in USEPA guidance (USEPA, 1997b), the Ecological Risk Assessment process can involve up to eight steps, described as follows:

Step 1. Screening-level problem formulation and ecological effects evaluation: This first step consists of a basic description of the Site and its habitats and known hazards and the likely modes of ecotoxicity. This information is then analyzed to determine whether there are complete or potentially complete exposure pathways from known sources. This information is combined into a preliminary Conceptual Site Model.

Step 2. Screening-level exposure estimate and risk calculation: The second step of the ecological risk screening includes the exposure estimate and risk calculation. Risk is estimated based on maximum exposure concentrations compared to ecotoxicity screening values from Step 1 and screening quotients of constituents of potential ecological concern (COPECs) are presented. A screening quotient less than or equal to 1 indicates the COPEC alone is unlikely to cause adverse ecological effects.

Step 2 ends with a Science-Management Decision Point (SMDP). SMDPs are points during the ERA process when the risk assessor communicates results of the assessment

at that stage to a risk manager. Decisions on the next action(s) are made by the risk assessor and risk manager.

Step 2 can produce only three outcomes: 1) Information is adequate to determine that ecological risks are negligible; 2) Information is inadequate to make a decision; or 3) Information indicates a potential adverse ecological effect exists. The risk assessment process is continued at Step 3 if either of the latter two conclusions is reached.

Step 3. Baseline ecological risk assessment (BERA) problem formulation: The results of the screening assessment, in coordination with Site-specific data, are used to assess the scope and goals of the BERA. The following should be completed at the end of this step: refine preliminary COPECs; further characterize ecological effects; review and refine information on contaminant transport and fate, exposure pathways, and ecosystems potentially at risk; select assessment endpoints; develop conceptual model with testable hypotheses; and analyze uncertainties associated with the risk assessment. Step 3 also ends with a SMDP.

Step 4. Study design and data quality objective (DQO) process: The conceptual model is completed during this step of the BERA, and measurement endpoints are developed based on the model. The conceptual model is used to determine the study design and the data quality objectives (DQOs). The products of this step include a work plan and sampling and analysis plan, detailing the data analysis methods, exposure parameters, data reduction and interpretation methods, and statistical analyses.

Step 5. Field verification of sampling design: The sampling design, testable hypotheses, exposure pathway models, and measurement endpoints are examined to ensure they are appropriate and that they can be implemented.

Step 6. Site investigation and analysis phase: This step includes all of the field sampling and surveys that are part of the BERA. The data collected during this phase are evaluated on existing and potential exposure and ecological effects outlined in Steps 1 to 5.

Step 7. Risk characterization: This step consists of risk estimation and risk description. Data on exposure and effects are used to characterize risk based on assessment endpoints. The product of this step is the identification of a threshold for effects on the assessment endpoint(s) as concentrations ranging from levels found to pose no ecological risk to levels likely to produce adverse ecological effects.

Step 8. Risk management: This phase involves balancing risk reductions associated with remediation of the Site with the potential effects of the remediation itself. Step 8 ends with a SMDP.

Steps 1 and 2 comprise the SLERA, while Steps 3 through 8 are the BERA. The following analysis will be limited to the SLERA. This SLERA will also follow other appropriate guidance, including:

- *Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities*, USEPA/530-D-99-001A, August 1999
- *Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation Manual, Interim Final*, USEPA/540/1-89/001, March 1989b
- *Framework for Conducting Ecological Risk Assessment*, USEPA/630/R-92/001, February 1992
- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessment*, USEPA/540/R-97/006, June 1997b
- EcoUpdate Intermittent Bulletins

4.1.1 RELATIONSHIP OF THIS SLERA TO OHIO GUIDANCE

Ohio also has guidance for conducting ecological risk assessments (Ohio EPA, 2003). The Ohio EPA ecological risk assessment guidance establishes the following four-step process:

- Level I Scoping ERA. This first step determines whether "important ecological resources are potentially exposed to chemicals released at the Site". Thus, it addresses two basic questions: 1) Are current or past releases at the Site suspected; and 2) Are important ecological resources present at or in the locality of the Site? If the answer to either question is no, the ERA can be terminated.
- Level II Screening ERA. In this second step, concentrations of chemicals measured in various on-Site and off-Site media are screened against ESV to identify contaminants of potential ecological concern. If concentrations of all chemicals in all media are below ESVs, then potential for ecological risk can be dismissed. However, if concentrations of some chemicals in some media are above ESVs, these are identified as COPECs. The CSM for the Site can be revised and further analyses of on-Site habitat can be conducted. A SMDP occurs at the end of Level II. At this point, the risk assessor and risk manager determine whether 1) no further action is necessary;

2) further, more detailed ERA activities should be pursued, (e.g., go to Step III); or 3) remediation should commence.

- Level III BERA. The basic objectives of this step are the following: 1) refine the potential for significant ecological effects at the Site using deterministic risk assessment procedures; 2) identify the COPECs responsible for these effects; and 3) if necessary, recommend analyses needed to refine risks or develop clean-up levels. In general, the Level III BERA consists primarily of more refined screening analyses that consider effects via bioaccumulation and consequent food chain effects. To that end, exposure to COPECs is generally modeled with simple food chain models, not-Site-specific bioaccumulation rates, and available concentration data on the Site's abiotic media.
- Level IV Field BERA. The Level IV analyses collect Site-specific data to confirm or refute the risks suggested in the Level II and Level III analyses. For example, if sediment concentrations were above the concentration level thought to pose risk to benthic invertebrates, these potential risks could be refined with surveys of benthic invertebrates and/or sediment bioassays. Similarly, potential risks from bioaccumulative substances via the food chain could be refined by collecting tissue samples of prey from the Site.

Although the terminology in USEPA and Ohio guidance differs, the summaries provided above indicate that the first three levels of the Ohio guidance are functionally equivalent to Steps 1 and 2, respectively, of the USEPA 8-Step ERA process. Level 4 of the Ohio guidance corresponds to Steps 3 through 8 of the USEPA process. Thus, this SLERA based on USEPA guidance satisfies the intent of the Ohio guidance, although the exact structure, placement of information, and terminology may differ.

4.2 STEP 1: SCREENING-LEVEL PROBLEM FORMULATION AND ECOLOGICAL EFFECTS EVALUATION

As described in USEPA guidance (USEPA, 1997b), this first step of the SLERA provides a basic overview consisting of the following information:

- The Site history, in terms of current and future land-use and potential chemical releases.
- The "environmental setting" of the Site. This is the natural and unnatural habitats that occur at the Site and whether these habitats are "potentially contaminated or otherwise disturbed" (USEPA, 1997b).

- The "assessment endpoints", which are the species, biological communities, or habitats that will be the primary focus of the risk assessment.
- The contaminants known or suspected to occur at the Site.

The basic Site history was discussed previously in Section 2.0, "Site Characterization". Information pertaining to the other bullets is presented below.

4.2.1 ENVIRONMENTAL SETTING

The following described the current ecological habitat at the Site and adjacent habitats.

4.2.1.1 GREATER MIAMI RIVER

The Site is bounded to west by the GMR and its floodplain. The GMR is a moderate sized river. Along the Site, the GMR has a drainage area of about 2600 sq. mi., and a median flow of about 2300 cfs[12]. The watershed is almost entirely developed for agriculture (about 80 percent) and urban/residential/industrial development (13 percent). Only about 5 percent of the watershed remains as forest (Anonymous, 1997; MCD, 2002). Consequently, the water quality of the GMR has been compromised by urban and agricultural sources of fertilizers and pesticides (Anonymous 1997, Rowe et al., 2004; MCD, 2002). Bottom sediments also contained low levels of banned pesticides (e.g., DDT and its breakdown products), and there was widespread elevation of industrial chemicals, such as PAHs and PCBs, upstream and downstream of Dayton (Ohio EPA, 1997, Rowe et al., 2004).

The physical habitat of the GMR has also been degraded. Following a major flooding in early 20th century, the GMR and its major tributaries were modified for flood control with a series of low head dams, some channel straightening, and levee building. Consequently, the USGS (Anonymous, 1997) identified the following two problems: "disruption and fragmentation of stream habitats by low dams and impoundments and their effects on fish and benthic invertebrate communities", and "habitat degradation and decreases in stream biodiversity as a result of urbanization."

In spite of these potential impacts to chemical and physical integrity, the results of Ohio EPA's 1995 fish and benthic macroinvertebrates sample collection in the GMR

12 These values are rough averages of data from USGS gauging stations at Dayton and Miamisburg, Ohio. The Site is about midway between these two gauging stations.

upstream, adjacent, and just downstream of the Site found "good" biological community performance. In terms of attaining the existing and recommended aquatic uses, adjacent areas of the GMR were in full attainment (Ohio EPA 1996).

4.2.1.2 QUARRY POND

The Quarry Pond is located in the southern portion of the Site. This pond is an inundated quarry, roughly square, with a total area of about 15 acres. There is an island, about 1/3rd of an acre, in the middle of this pond. CRA's bathmetry survey results show that the Quarry Pond is divided by a long, north-south trending shallow ridge that extends through the island located on the east side of the Quarry Pond. The deepest areas occur in the western half of the Quarry Pond, where CRA observed water depths in the range of 20 to 30 ft. The northwest portion of the Quarry Pond was deeper than 35 ft, and the overall average depth is at least 18 ft deep. However, the total and mean depth vary with season as it appears that the Quarry Pond is hydraulically just an area of exposed groundwater, falling and rising in tandem with water levels in adjacent groundwater wells and the nearby GMR. As described in Section 2.5.3 above, the Quarry Pond has been described as an "intermittently exposed" wetland, which means it may dry up during very severe droughts. However, given the water depths measured by Ohio EPA and confirmed by CRA's bathymetry, it seems unlikely that this pond would completely dry up under any reasonably foreseeable drought condition.

There are no inflowing streams to the Quarry Pond. Given the highly permeable nature of the overburden and generally flat terrain of the surrounding Site, inflow of groundwater appears to be the Pond's primary source of water. The Quarry Pond also has no surface outlet so flow out of the Quarry Pond is also likely via groundwater and evaporation. Consequently, the primary water inflows are assumed to be via groundwater from the north. Water likely flows out of the Quarry Pond, again via subsurface groundwater, to the south and southwest.

The Quarry Pond is apparently a functional habitat since anglers have been seen fishing the area. A potential source of these fish would be during severe floods of the GMR, which could potentially reach the Quarry Pond. Local anglers will also often stock quarries and unnatural ponds with local fish. Fish can also be introduced by animals, as eggs attached to waterfowl or as adult fish dropped by piscivorous birds. If so, the fish stocks in the Quarry Pond will likely consist of the warm-water species found in the GMR. These would include game fish such as largemouth and smallmouth bass, rock bass, channel catfish, bluegill, but also carp, suckers, and minnows.

In addition to serving as habitat for fish, the Quarry Pond may also may also contain various anuran species such as green frogs and bullfrogs. It may also attract migratory waterfowl.

4.2.1.3 TERRESTRIAL HABITATS

As described previously in Section 2.5.6, the middle of the Site is undeveloped land that is naturalizing into an early succession forest, dominated by small trees, saplings, and scrubs. In its 1994 Site inspection, PRI observed the following vegetation: sycamore, cottonwood, box elder and black willow, reed canary grass, water plantain, and poison ivy. Much of the north and eastern portions of the Site are now developed for various commercial/industrial processes, e.g., Valley Asphalt to the north and the auto salvage yard to the southeast. There is little functional terrestrial habitat in these areas.

4.2.1.4 WETLANDS

4.2.1.4.1 LARGE POND AND SMALL POND

There are two small man-made ponds, referred to as the Large Pond and Small Pond (Figure 1.2) at the Site. These ponds are fed by groundwater and overland drainage. They have no outlets and have no significant inlets, although a small, ephemeral creek reportedly drains into the Small Pond. These ponds rise and fall with groundwater levels, and dry up completely during the summer when groundwater elevations and precipitation decline.

Despite its name, the Large Pond is never more than about an acre in area or 3 ft in depth. Based on NWI maps, the total area is less than 0.5 acres. It was described, by the 1995 FSIP, as palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded and excavated. The 1995 FSIP also indicates that no obvious wetland vegetation, such as cattails or willows, was observed in the Large Pond during the 1994 Site reconnaissance. When inundated, the Small Pond is much smaller, less than 0.25 acres. It is also a man-made feature.

Both ponds appear to provide vernal-pool habitat. Vernal pools fill with water during wet periods and dry up completely during droughts. Complete drying is critical to their habitat value. They do not support breeding populations of fish and may, therefore, be important breeding areas for many species of amphibians and some invertebrates. These species are often eliminated from permanent water bodies because of fish

predation. Although the biota of the Large and Small Ponds was not assessed in the OU1 RI, the following species are typical of vernal pools in Ohio. Obligate species are those species that require a vernal pool for the completion of their life cycle. Facultative species are species that do not require a vernal poll but will utilize a vernal pool if present. Periodic inhabitants are those species (usually predators) that will utilize a vernal pool for foraging. Examples of obligate and facultative species and periodic inhabitants are as follows:

- Obligate Species
  - Spotted Salamander (*Ambystoma maculatum*)
  - Jefferson salamander (*Ambystoma jeffersonianum*)
  - Spotted salamander (*Ambystoma laterale*)
  - Wood frog (*Rana sylvatica*)

- Facultative species
  - Green frog (*Rana sylvatica*)
  - Bullfrog (*Rana catesbiana*)
  - Northern spring peeper (*Pseudacris crucifer*)
  - Western chorus frog (*Pseudacris trieriata*)
  - Northern gray tree frog (*Hyla versicolor*)
  - American toad (*Bufa americanus*)

- Periodic Inhabitants
  - Wood turtle (*Clemmys insculpta*)
  - Spotted turtle (*Clemmys guttata*)
  - Eastern painted turtle (*Chrysemys p. picta*)
  - Common snapping turtle (*Chelydra s. serpentina*)

4.2.1.5 RARE, THREATENED, AND ENDANGERED SPECIES

Species of special concern were discussed above in Section 2.5.6.1. No threatened or endangered species are expected on the Site. The Site is highly disturbed by previous human activities and, therefore, CRA did not complete a detailed survey of the Site's potential for harboring threatened and endangered species.

4.2.2 IDENTIFICATION OF COMPLETE EXPOSURE PATHWAYS/PRELIMINARY CONCEPTUAL SITE MODEL

For risk to occur, ecological receptors must be exposed to Site-related chemicals. Hence, a fundamental step in the SLERA process is the identification of complete and potentially complete exposure pathways. Complete exposure pathways are those in which a contaminant is able to travel from the source to ecological receptors and, once there, to be taken up by the ecological receptors. Thus, whether an exposure pathway is complete or not depends on several factors, including the current locations of chemicals and ecological receptors as well as the fate and transport that might bring them together. Therefore, while ecological receptors are not generally exposed to groundwater, they may be exposed to contaminated groundwater when it discharges to nearby surface water.

The potential for exposure to groundwater also depends, in part, on the nature of the specific chemical since some very hydrophobic or insoluble chemicals do not travel readily in groundwater. Thus, identification of complete exposure pathways is based on previously discussed information concerning the location and types of chemicals, location and types of ecological receptors, and the potential fluxes of the first to the second. Once complete, potentially complete, and incomplete pathways are identified, they are summarized in the preliminary CSM.

The preliminary CSM for this Site is presented on Figure 4.1. Based on information discussed in previous sections, it can be concluded that complete exposure pathways exist from COPECs in surface soil to ecological receptors. These complete exposure pathways are limited to the undeveloped middle portions of the Site. These areas have functioning terrestrial habitat in which ecological receptors and contaminants co-occur. In contrast, exposure pathways to surface soil in developed areas of the Site (e.g., Valley Asphalt, the auto salvage yard) are limited by the ongoing disturbance and dearth of habitat at those locations. In addition, exposure to contaminants in deeper soil is considered incomplete (USEPA, 1997b). Surface soil for this SLERA is defined as those samples taken in the top two ft of soil.

Complete exposure pathways also currently exist from chemicals in surface water of the Quarry Pond to its aquatic biota. Similarly, complete exposure pathways exist between chemicals in Quarry Pond sediments to aquatic and semi-aquatic biota using that habitat.

Complete exposure pathways also exist from chemicals in groundwater discharging to the Quarry Pond and Large and Small Ponds. In general, exposure pathways via

discharging groundwater are limited to more soluble chemicals such as VOCs that travel more readily in groundwater. Groundwater discharge to surface water is generally not a significant exposure pathway for particle-reactive substances such as hydrophobic organics (e.g., PCBs, pesticides, high molecular weigh PAHs) and adsorptive, less soluble heavy metals. These chemicals generally do not readily dissolve and move in groundwater. However, the aquifer material at the Site is highly permeable sands and gravels that may facilitate transport of even less soluble chemicals. To reflect this Site-specific condition and to be conservative, exposure pathways for all chemicals in groundwater to nearby surface water are considered complete. Thus, all chemicals in groundwater are screened for ecological risk.

Assessing the significance of potential exposure pathways to biota inhabiting the temporary ponds is complicated by 1) the lack of analytical data from these areas and 2) the two ponds' ephemeral nature. With respect to the first, neither the sediments nor water column of the Large or Small Ponds have been characterized. This may not be a significant data gap since these areas may have limited aquatic habitat potential. These ponds are very small, ephemeral, and they do not contain reeds or wetland vegetation. Consequently, these ponds will not harbor fish or semi-aquatic herbivorous wildlife, such as muskrats or semi-aquatic herbivorous birds. Nonetheless, complete, albeit ephemeral exposure pathways, will occur from chemicals in surface water and sediments to invertebrates and amphibians that may inhabit these vernal pools. Predators feeding on these invertebrates and amphibians will also be exposed. However, as stated previously, exposure pathways to these temporary pond species, and their predators, is limited by the very small size, ephemeral nature, and poor habitat quality of the on-Site ponds.

Exposure pathways also exist from chemicals in on-Site groundwater and, potentially, surface soil to the GMR. Thus, the SLERA also addresses potential risks to the GMR from current or future erosion of on-Site (OU1) soils or migration of contaminants from on-Site shallow groundwater even though the River is technically off-Site.[13] Historical contamination of the GMR and the GMR floodplain due to Site activities will be addressed during the OU2 RI/FS. Notably, groundwater from the Site discharges to the GMR; thus, exposure pathways from on-Site groundwater to the GMR are considered complete. In contrast, exposure pathways from on-Site surficial soils are considered potentially complete.

13 This SLERA focuses on OU1, as described in Section 1.0. Adjacent areas, including the floodplain of the GMR and the GMR are part of OU2.

Much of the middle and southern portions of the Site are within the 100-year floodplain, and the toe of the man-made embankment may often be flooded (USEPA, 2007a). During these flood events, there is potential for chemicals in surface soil of the Site and the man-made embankment to be eroded into the GMR (USEPA, 2007a). There is a potentially complete exposure pathway from the Site's surface soil to aquatic receptors in the GMR, assuming that that surface soils are, in the future, eroded and carried into the GMR during floods. Because erosion of landfill material into the GMR may have occurred in the past, potentially complete exposure pathways currently exist between aquatic receptors in the GMR and Site-related contaminants in the nearshore sediments of the GMR (USEPA, 2007a); however, past impacts to the GMR will be addressed as part of the OU2 RI/FS. In both cases, however, the potential for past and future erosion is unknown, so these exposure pathways are, as suggested above, considered only potentially complete.

4.2.2.1 ASSESSMENT ENDPOINTS

Assessment endpoints are the specific ecological values that should be protected from Site-related chemicals. According to USEPA guidance, assessment endpoints should be selected based on several factors: economic importance, importance to society, ecological importance, and sensitivity to contaminants (USEPA, 1996; USEPA, 1997b). Another critical consideration in selecting assessment endpoints is the current and likely future land-use, because these constrain the value and types of on-Site habitats and the potential for species to inhabit the Site.

Much of the land is currently zoned industrial/commercial. However, the undeveloped middle portion of the Site is not developed and is mostly old field/early succession forest habitat. This area is serving as functional, albeit somewhat poor terrestrial habitat. Hence, appropriate assessment endpoints for current terrestrial land-use should be reasonably broad because the terrestrial area is functional habitat. However, the area is zoned for and, thus may be developed for, industrial/commercial use. Industrial or commercial development of the area that is now terrestrial habitat along with human disturbance accompanying the development would further limit the habitat and wildlife use. Thus, assessment endpoints appropriate for these potential future land uses are much more limited.

In contrast, assessment endpoints for the aquatic areas will likely remain broad and constant into the future. The GMR is a water of the State and, thus, constitutes prime aquatic habitat now and in the future. Although the Quarry Pond is man-made, the pond has been in existence for several decades. It likely will be treated as open water of

the State such that it too will constitute viable aquatic habitat into the future. Although the Small and Large Ponds are unnatural, small, ephemeral, and have limited habitat potential, they occur in the GMR floodplain. Thus, they are also considered functional wetlands habitat now and into the future.

Given this background, CRA selected the following assessment endpoints. In the following text, aquatic habitat refers to the GMR, Quarry Pond, and the two temporary ponds. Unless stated otherwise, assessment endpoints listed below apply now and for future land-uses.

- Protection of the benthic invertebrate in aquatic habitat community from changes in structure and function due to Site-related contaminants
- Protection of the water column community of aquatic habitats from changes in structure and function due to Site-related contaminants
- Maintenance of populations of fish-eating wildlife similar to nearby sites not exposed to Site-related contaminants
- Maintenance of populations of wildlife foraging on aquatic insects emerging from on-Site aquatic habitats
- Maintenance of populations of worm-eating wildlife similar to those found in similar habitats not exposed to Site-related contaminants. Current land use only.
- Maintenance of populations of top predators similar to those found in similar habitat not exposed to Site-related contaminants. Current land-use only.

4.2.2.2 CONTAMINANTS KNOWN OR SUSPECTED TO OCCUR AT THE SITE

By convention, contaminants known or suspected to occur at a Site are termed COPECS, defined above. According to guidance (USEPA, 1991, USEPA, 1997b), COPECs should be selected based on an understanding of what chemicals were used and potentially released at a Site. This area received a variety of different kinds of wastes, including municipal waste, chlorinated solvents and foundry sand contaminated with various heavy metals. There is also widespread contamination with PAHs. Much of the PAHs are likely associated with partially burnt wood and ash from on-Site burning of wood, refuse, and debris (LSP, 1999), although the Site also received other potential sources of PAHs (e.g., asphalt, coal fly ash, and cinders). PCBs were also found, presumably associated with dismantling of transformers or other electrical equipment at the Site. There are also low concentrations of chlorinated pesticides (e.g., dieldrin, endrin,

chlordane, and DDT and its breakdown products). The source of these pesticides is unknown. However, the GMR watershed is very intensively farmed, so some of these pesticides could be due to past flooding of the GMR and deposition of pesticides from upstream agricultural areas onto the Site, in addition to potential on-Site disposal.

4.3 STEP 2: SCREENING-LEVEL EXPOSURE ESTIMATE AND RISK CALCULATION

In the second step of the SLERA, COPECs and complete exposure pathways identified in Step 1 are screened in terms of their potential to cause ecological risk.

4.3.1 SCREENING OF COPECS

In analyses that follow, COPECs were screened for potential ecological risk to assessment endpoints using the quotient method. Specifically, screening quotients (SQ) are estimated as follows:

$$SQ = \frac{EEC}{ESV}$$

where:

EEC = the estimated exposure concentration
ESV = the ecological screening value

In accordance with USEPA guidance, the EEC in the SLERA screening is based on the maximum concentration of each chemical detected in each medium. The mean concentration is also presented to provide perspective on average risk faced by populations of organisms. An SQ less than 1.0 indicates that the COPEC alone is unlikely to cause adverse ecological effects. Risks from these chemicals can be dismissed as unlikely. Risks from chemicals with SQs > 1.0 cannot be dismissed. These chemicals are retained in the risk assessment for further analysis.

Two modifications of this general rule are noted. First, as recommended by USEPA (2004) and Ohio EPA (2003) guidance, CRA rounded SQ values to one significant digit. Consequently, chemicals with SQ values less than 1.5 were not retained for further analysis. In addition, CRA added SQ values for chemicals with a similar mode of action (e.g., different PAH compounds and toxicity to benthic invertebrates) to account for

cumulative effects. In these cases, CRA retained chemicals even though individual chemicals had SQ values less than 1.5.

A variant of the above equation is used in sections below which estimate risks via bioaccumulation and food chain exposure. In this case, the SQ is estimated as the estimated exposure divided by the TRV, both of which are doses (mg/kg-day). Moreover, since food chain exposure occurs over some foraging range for which a single sample point is inappropriate, CRA evaluated exposure via bioaccumulation pathways with the still conservative 95% UCL instead of the maximum concentration. Based on the Assessment Endpoints identified previously, the risk screening will address potential risks to the following groups of animals from the following media:

- Potential effects of COPECs in surface water to water column community of on-Site aquatic habitats
- Potential effects of COPECs in sediments on benthic invertebrate community inhabiting the aquatic sediments
- Potential impacts of COPECs to fish-eating wildlife foraging in on-Site aquatic habitats
- Potential effects of COPECs to insectivorous wildlife foraging on insects emerging from on-Site aquatic habitats
- Potential effects of COPECs in soil to worm-eating wildlife: current land-use only
- Potential effects of COPECs in soil to top predators foraging in terrestrial areas: current land use only

4.3.2 ESVS FOR SOIL

Where available, CRA selected ESVs for chemicals in soil from Ecological Soil Screening Levels (EcoSSLs) produced by the USEPA (USEPA, 2000b). These benchmarks have the following advantages:

- They are intended to be protective of all ecological receptors through both direct toxicity (e.g., toxicity to plants and soil invertebrates) and indirect toxicity by bioaccumulation (e.g., toxicity after bioaccumulation to herbivores and predators)
- Their derivation is described in detail, and they have undergone some external review

However, for several of the metals (e.g., antimony, cadmium, vanadium, and lead), the EcoSSLs have the disadvantage of being below naturally occurring background concentrations. ESVs below background concentrations are of limited scientific validity and utility. With respect to their legitimacy, ESVs less than background imply that toxicity occurs to wide-ranging species from naturally occurring, wide-ranging soil concentrations. With respect to their utility, ESVs less than background concentrations are ineffective, because they fail to screen out naturally occurring chemicals within background concentrations. For example, soil at virtually all sites in the United States will contain antimony and vanadium at concentrations greater than the EcoSSLs.

The EcoSSLs documents for aluminum and iron are narrative descriptions and do not provide specific screening values. According to these narratives, aluminum is assumed to be non-toxic to ecological receptors except at low pH (<5.5), and iron is also considered to be a non-problematic constituent in soil. Consequently, CRA did not consider either aluminum or iron problematic in soil.

Where there were no EcoSSLs for a metal available, the Netherlands MPCs (Maximum Permissible Concentrations) from Crommentuijn et al. (1997) were applied as ESVs. The MPCs are estimated as the maximum amount of a metal that could be added to background concentrations without causing toxicity to most species. The derivation of the Netherlands MPCs is transparent, and it is well described in the source document (Crommentuijn et al., 1997). The Netherlands values also specifically incorporate background concentrations. On the other hand, these values are primarily based on direct toxicity, although potential toxicity via bioaccumulation pathways is a minor part of the derivation. USEPA (2006a) has recommended these values.

If neither an EcoSSL nor a Netherlands MPC value was available, then CRA used USEPA (2004) Region V ecological screening levels (ESL). The Region V ESLs consider toxicity by both direct toxicity and bioaccumulation, and they are derived for a wide variety of organic and inorganic compounds.

The actual derivation of these ESVs is not presented in the source documents. In addition, the Region V ESLs for some compounds, notably metals, chlorinated pesticides, and PCBs, are very conservative. Soil ESLs for metals are often one to two orders of magnitude less than naturally occurring concentrations, rendering them inefficient as screening criteria. The Region V ESLs for many of the chlorinated pesticides, PCBs, and dioxins are so low that almost any detected concentration is greater than the ESL, which again constrains their utility as screening values.

No ESVs are available for calcium, potassium, sodium, and magnesium. However, these metals are essential macronutrients that have minimal potential to cause toxicity. Consequently, potential risks from these nutrients will be discounted as unlikely. For the same reason, potential risks from these nutrients will be considered as unlikely in the screening of these nutrients in sediments and surface water.

4.3.3 ESVS FOR SEDIMENTS

For most compounds, sediment screening values were obtained from Region V when available. In general, Region V ESVs are threshold effect concentrations (TEC) values (MacDonald et al., 2000) were used to screen chemicals in aquatic sediments. Use of TEC values are also recommended by Ohio EPA (Ohio EPA, 2003). The TEC values are based on a variety of other sediment quality guidelines, such as the National Oceanic and Atmospheric Administration (NOAA) ER-L (Environmental Effects Range - Low) values and Ontario's LEL (Lowest Effects Level). The TEC values are based on larger databases and more varied habitats than any of the individual sources.

TEC values have the advantage of being widely used and widely accepted. They are also very conservative, so that there is little chance that toxic sediments will be dismissed as non-toxic. This conservatism, however, means TEC values are useful only in screening for lack of toxicity; sediment concentrations that are greater than the TEC values does not equate to environmental impact. Moreover, TEC values are sometimes less than naturally occurring background values, making them inefficient as screening concentrations. Lastly, the TEC values are based on the co-incidence of sediment toxicity/observed impacts with an observed concentration of a compound. Consequently, much of the information used to develop a TEC value potentially resulted from toxicity from other compounds. Recent analyses indicate that the TEC values are actually simply background values (Smith and Jones, 2005), rather than toxicologically-based endpoints.

If no TEC value was available, CRA used sediment quality values generated by the Netherlands (Crommentuijn et al., 1997). These values were derived with similar methods as the Dutch soil criteria and have the same advantages. If no TEC or Dutch values were available, CRA used ESVs presented in USEPA Region V or NOAA (1999).

CRA screened PAHs using final chronic values (FCV) for sediments based on narcosis theory as developed and proposed by USEPA (USEPA, 2003c). The narcosis theory suggests that PAHs exert toxicity via a common mechanisms - narcosis. Consequently, the relatively meager dataset on the toxicity of one specific narcotic chemical, for

example naphthalene, could be combined with the rather extensive toxicity information on all narcotic chemicals. By this method, USEPA used the extensive toxicity database for many non-polar organics to estimate water column toxicity of all narcotics. This summed toxicity information, on all narcotics and all species, was then used to generate safe water column concentrations, or FCV, for each PAH (USEPA, 2003c).

Using equilibrium partitioning, these safe water column concentrations can be converted to safe sediment concentrations based on organic carbon concentrations. Organic carbon was not assayed in Site sediments in which elevated levels of PAHs were detected. However, CRA assumed that these sediments contain a relatively moderate concentration of 2% organic carbon[14]. Since the toxicity of the different PAHs is additive, the total toxicity is the summation of the screening quotients of individual PAHs. Furthermore, the summed quotient must be adjusted to account for PAHs that are not typically assayed. Based on information presented in USEPA (2003c), CRA applied a correction factor of 2.3 to the sum of PAH quotients based on the 17 PAHs assayed in these samples. The final adjusted summed quotient is called the ESB (equilibrium partitioning sediment benchmark). As with other quotients, ESBs less than 1.0 are considered evidence of no toxicity.

Several factors should be considered when assessing the implications of an ESB. First, the FCVs for PAHs are based on the most sensitive species from a list of species that include marine and freshwater species, invertebrate and vertebrate, and benthic and water column species. Freshwater organisms, in general, were less sensitive to PAH toxicity than marine species, and true infaunal species tended to be less sensitive than water column and epifauna species. Taken together, freshwater infauna species were 5 to 10 times less sensitive to narcotics than the most sensitive species. Second, the ESB method assumes that benthic organisms are only exposed to sediment pore water. In fact, even true infaunal benthic organisms are generally exposed to a combination of sediment pore water and overlying water. As the latter is generally less contaminated, real world exposures to sediment bound PAHs are generally lower than those estimated with the ESB model. Third, the ESB model assumes that sediment organic carbon is entirely partially decomposed organic matter, and contains no carbon from incomplete combustion, sometime called "black carbon". Black carbon is widely dispersed in the environment and binds much more tightly to organic chemicals (e.g., see USEPA 2003c; Cornelissen et al. 2005; Shrethra et al. 2010). In sediments containing black carbon, pore

14 According to descriptions, both samples from the Quarry Pond contained noticeable organic matter. Sample S-15 was described as "fines with sandy silt with organic humus (intermixed), brown in color". Sample S-16 was described as "very fine sediment, thick consistency, marble brown and black. Organic debris (leaves and weeds)."

water concentrations of PAHs are often considerably lower than predicted with equilibrium partitioning.

Thus, the ESB method can be moderately conservative, especially when applied to freshwater infaunal species. Toxicity to freshwater benthos may not occur until ESB quotient are considerably greater than 1.0, i.e., in the range of 5 to 10 (Smith 2007)

4.3.4 ESVS FOR SURFACE WATER AND GROUNDWATER

For PAHs and applicable VOCs, CRA based the ESVs on the narcosis theory presented in USEPA guidance (USEPA, 2003c) for PAHs and USEPA guidance (USEPA, 2008b) for VOCs and other non-polar organics. As described above, USEPA derived FCVs for water based on narcosis theory. As they are calculated, FCV pertain to truly dissolved compounds, whereas the groundwater and surface water samples for organics are unfiltered. Unfiltered water samples should not have much effect on the concentrations of the more soluble compounds, such as VOCs and more soluble PAHs (e.g., naphthalene). However, much of high molecular weight PAHs measured in groundwater will likely be adsorbed to particles and organic matter. Thus, comparisons of concentrations of high molecular weight PAHs in the water samples to these ESVs is conservative. Technically, quotients for all narcotics should be added together because their toxicity is additive. For screening against maximum concentrations, however, CRA treated the FCVs as stand-alone ESVs because 1) the maximum concentrations of the different narcotic chemicals often did not co-occur and 2) much of the mass of PAHs detected in groundwater is likely adsorbed and, thus, not toxic.

For metals, CRA chose water quality criteria (WQC) for aquatic life from Ohio (Ohio EPA 2009b) as its first choice. If no Ohio WQC was available, CRA used national freshwater quality criteria (USEPA, 2006b). If no national freshwater quality criteria were available, ESLs from USEPA Region V were employed. None of these sources has a manganese criterion; thus, CRA used the manganese criterion developed by Michigan (MDEQ, 2000). In all cases, CRA used the more conservative chronic aquatic life criteria.

Some of the metals criteria depend on water hardness. Hardness was often measured in these water samples. Thus, hardness values were augmented with those calculated from measured calcium and magnesium concentrations (APHA, 1992) as

$$\text{Hardness, mg/l as } CaCO_3 = 2.497 * [Ca] \text{ mg/l} + 4.1189 * [Mg] \text{ mg/l}$$

Hardness in groundwater averaged about 400 mg/L, and CRA based the metals criteria on this average values.

Most of the water quality criteria for metals are applicable to dissolved metals concentrations, because adsorbed and insoluble metals pose little to no risk. Thus, CRA screened total metals concentrations but CRA based the decision to retain a metal as a COPEC on its dissolved concentration.

4.3.5 RESULTS OF COPEC SCREENING

The follow sections describe the results of the screening of chemical concentrations observed in soil, sediment, water, and groundwater and selection of initial COPECs. The results of screening of maximum concentrations against conservative ESVs are presented in Tables 4.1 through 4.5, along with information about detection limits, frequencies of detection, and locations of the maximum concentrations. Table 4.6 gives a summary of the initial COPECs based on the screening.

4.3.5.1 SOIL

The results of the soil screening are presented in Table 4.1. As shown in that table, the concentrations of a number of substances were greater than the ESVs and CRA retained them as initial COPECs. Retained compounds were primarily metals and high molecular weight PAHs. However, CRA also retained PCBs, dioxin/furan TEQ[15], and several phthalates as initial COPECs. Although a number of VOCs or pesticides were detected in surface soil samples, none were detected at concentrations greater than the ESVs and, hence, CRA retained none as initial soil COPECs.

Cyanide was detected at a concentration moderately greater than its ESV. However, it will not be considered further for the following reasons. The Region V ESV is likely based on free cyanide, whereas the soil samples were analyzed for total cyanide. While toxic, free cyanide is very soluble and very non-persistent in surface soil (NPS 1997). In contrast, total cyanide in soil is primarily tightly bound forms that have minimal toxicity. Moreover, further assessments will focus on potential risks to vertebrates via

15 Dioxin TEQ was based on toxicity equivalent factors presented in Van Den Berg et al. 1998. Note that all subsequent analyses, including bioaccumulation, conservative treat TEQ as if it were only TCDD. This will exaggerate bioaccumulation since most other dioxin/furan congeners are bioaccumulated less efficiently than TCDD.

bioaccumulation pathways, and neither free cyanide nor total cyanide is likely to be bioaccumulate readily in food chains (NPS 1997).

4.3.5.2 SEDIMENT

CRA separately screened sediments in the Quarry Pond and GMR because GMR sediments are not part of OU1. GMR sediment data were included as an indicator of potential future effects that erosion of Site soils or the discharge of shallow on-Site groundwater to the GMR might have on GMR sediment quality. Existing GMR sediment quality will be evaluated during the OU2 RI/FS. The potential erosion risk and impact to GMR sediments are screened in Section 4.5 below. Screening of Quarry Pond sediments using conservative ESVs suggested that only PAHs and a small number of pesticides pose any potential for risk to benthic invertebrates (Table 4.2). PCBs, bis(2-ethylhexyl)phthalate, barium, and cyanides were also present at concentrations greater than their ESVs. All were retained as initial COPECs for further analysis of Quarry Pond Sediments.

Observed sediment concentrations of cyanide greatly exceeded the Region V sediment benchmark. However, as described above, the Region V sediment benchmark appears to be based on free or dissolved cyanide[16], while sediment concentrations pertain to total cyanide. As with metals, only the dissolved form of cyanide poses significant toxicity (NPS 1997). Free cyanide is unlikely to persist in surface sediments; it is very soluble, does not partition readily to sediments, and is rapidly degraded or volatilized from surface water (NPS 1997). Thus, most of the total cyanide measured in sediments must have been insoluble, non-bioavailable forms.

No sediment samples were taken from the Large Pond or Small Pond; hence, no screening of sediments in these areas can be done.

16 The value also appears to be miscalculated. The ambient water quality criterion for free cyanide is 5.2 µg/L. Free cyanide does not readily partition to aquatic sediment; thus, free cyanide in sediments will mostly be associated with pore water. Most aquatic sediments average about 50 percnet or more water, by mass. Conservatively ignoring the mass of free cyanide adsorbed to sediments would, therefore, suggest a minimum sediment quality benchmark about 1/2 of the water quality criterion, or about 2.5 µg/kg.

4.3.5.3 QUARRY POND SURFACE WATER

Only VOCs were analyzed for in Quarry Pond surface water, and none were detected in those samples. Consequently, no VOCs were retained as COPECs in Quarry Pond surface water.

4.3.5.4 GROUNDWATER

The results of the groundwater screening are presented in Table 4.3. The maximum concentration of only nine substances were in excess of the conservative ESVs and were retained as initial COPECs. These initial COPECs consisted of 1 VOC, 2 SVOCs, 3 metals, and three PCB Aroclors.

The conservativeness of this initial screening should be considered. Notably, only a small number of compounds were present at concentrations greater than the conservative ESVs despite the fact that there were often many groundwater analyses - about 250 to 350 for VOCs and about 100 analyses for SVOCs. Moreover, only analyses for metals were filtered. Thus, measured concentrations of particle-reactive SVOCs, PCBs, and pesticides likely included sorbed substances that would not migrate to nearby surface waters and, if discharged to surface water, would pose little toxicity. In addition, the analyses above do not account for ongoing fate and dilution processes that will occur between the monitoring wells and the receiving surface waters.

To partially address the last factor, CRA chose groundwater quality data for samples collected from sentinel wells to assess groundwater quality nearest to points of discharge to the primary aquatic resources - the GMR and the Quarry Pond. Sentinel wells for the GMR were those at the north, west, and eastern periphery of the Site and CRA assumed that, if groundwater were to interact with surface water in these areas, the groundwater quality represented by this database would provide the full range of concentrations likely to be in the discharge. Clockwise from the bottom of the Site, these peripheral wells, include vertical aquifer sampling (VAS) borings were VAS-20, MW-218A/B, MW-102, MW-103, MW-201, MW-206, MW-207, VAS-01, VAS-06, VAS-05, and VAS-4. Groundwater from the middle of the Site is generally to the Southwest. Therefore, sentinel wells for the Quarry Pond were those wells just to the north and east of the Pond. Going clockwise from north of the Quarry Pond, these sentinel wells were MW-101A, P-211, MW-209, VAS-19, MW-209A, MW-212, and VAS-22. Concentrations of initial groundwater COPECs were rescreened for the database from both sets of sentinel wells, using the same ESVs as in the initial groundwater screening.

For the GMR sentinel wells (Table 4.4), only two detected compounds, iron and bis(2-ethylhexyl)phthalate (BEHP), were present at concentrations greater than their conservative ESVs. However, neither was retained as a COPEC for the following reasons. First, high iron concentrations are routinely found in groundwater without causing harm to aquatic systems. In the case of BEHP, the exceedance is due to the conservativeness of Region V ESV rather than actual potential effects. According to experimental work in both the water column (Call et al., 2001a) and sediments (Call et al., 2001b), BEHP cannot be toxic to aquatic life because the compound's water solubility is less than toxic concentrations. Moreover, BEHP is very hydrophobic, so much of the BEHP detected concentrations in unfiltered groundwater sample is likely adsorbed to particles, rather than freely mobile in groundwater. Thus, risks from BEHP can also be dismissed as unlikely. Consequently, no compound was retained as COPECs in groundwater in GMR sentinel wells.

For the Quarry Pond Sentinel wells, the maximum concentrations of iron again were greater than the conservative ESV (Table 4.5). Iron was not retained as a COPEC for the same reasons stated above. The maximum concentration of benzo(b)fluoranthene was also slightly greater than its ESV. However, it was not retained as COPEC because 1) the exceedance of the conservative ESV was minimal; 2) most of this very hydrophobic substance (log Kow[17] > 6) is likely adsorbed rather than dissolved and bioavailable; and 3) the average concentration in the groundwater samples collected from the sentinel wells was about 1/10th the maximum. Thus, upon rescreening, no substance in groundwater was retained as a COPEC.

4.3.6 SCREENING OF BIOACCUMULATIVE COPECS WITH FOOD CHAIN MODELS

Although the EcoSSLs and many Region V ESVs account for potential risks via direct toxicity and food chains/bioaccumulation pathways, many ESVs do not. For example, comparison of surface water and groundwater to surface water criteria addresses risks to organisms living in the surface water. Similarly, the sediment benchmarks primarily screen for direct toxicity to the benthos, organisms that live in or on the sediments. However, the COPECs may also pose risk to predators after bioaccumulation by organisms low in the food chain. Thus, the COPECs in sediments may pose risks to predators of the benthos, if significant bioaccumulation occurs, in addition to posing direct toxicity to the benthos themselves. Potential predators of benthos include birds, such as ducks, and raccoons that feed on the aquatic benthos. After emergence, adults

17 Kow- Octanol-water partitioning coefficient.

of the benthic insects present a complete exposure pathway from chemicals in sediments to bats, swallows, and other insectivorous birds such as redwing blackbirds. If a COPEC bioaccumulates readily in food chains, as with PCBs and some of the pesticides, these COPECs may be passed up from the sediments through the benthos to the fish, and, from there, pose risk to fish-eating predators such as mink and herons.

In view of this potential, this SLERA considers potential toxicity of COPECs through bioaccumulation pathways as well as direct toxicity. In general, the most significant risks from soil-bound chemicals pertain to the worm predators such as shrews and woodcocks. Of terrestrial wildlife, generally the worm-eating wildlife are most exposed to soil-bound chemicals (Efroymonson *et al.*, 1997; USEPA Region V, 2000; USEPA, 2003c) for several reasons. First, the soil-to-worm pathway is, compared to soil to plant bioaccumulation, generally more efficient. Second, shrews and small worm-eating birds face high exposure due to their high rates of food consumption per unit biomass. Third, worm predators tend to have high rates of incidental soil ingestion. Exceptions to this general rule occur for compounds such as PCBs that biomagnify in terrestrial food chains. In these cases, predators at the top of food chains can be most exposed to soil-bound compounds.[18] Consequently, it is generally sufficient to consider these two ecological guilds – the top predators and the worm predators – in assessing potential for bioaccumulation risks from soil bound chemicals. In this SLERA, worm eating wildlife will be represented by shrews and woodcocks. Red tailed hawks and foxes will represent the top predators.

For COPECs in aquatic systems, risks from bioaccumulation can generally be assessed by considering fish-eating wildlife and predators of aquatic benthos. In this SLERA, fish-eating wildlife will be represented by great blue herons and mink. Bats and swallows, which may feed on aquatic insects emerging from on-Site sediments, will represent consumers of aquatic benthos.

To be conservative, CRA modeled the potential food chain exposure to COPECs using worst-case assumptions. That is, these receptors were assumed to eat only contaminated food from the Site for their entire lifespan. Thus, shrews and woodcocks were assumed to eat only worms from the Site, and the aerial insectivores were assumed to eat only aquatic insects emerging from the Site's aquatic environments. The total exposure for each species was modeled as follows:

---

18 In reality, risks from biomagnifying chemicals to top predators will generally be minimized by their large foraging ranges compared to the size of most contaminated sites. Consequently, the predators of soil invertebrates are often most exposed to PCBs and other biomagnifying chemicals as well as the metals and non-biomagnifying organics.

Total Dose = [food] * consumption rate * absorption efficiency + [soil] * incidental soil consumption rate * absorption efficiency + [water] * drinking rate * absorption efficiency + [air] * inhalation * absorption efficiency + [soil] * dermal absorption rate + [airborne dust] * dust inhalation * absorption efficiency.

All bracketed terms (e.g., [water]) refer to the concentration of the chemical in that medium; other values are self-explanatory. Based on the conservative methodology recommended by the USEPA (1997b), CRA assumed that the relative absorption efficiency[19] was 100 percent for all pathways. On the other hand, the last three terms (exposure via air, dermal absorption, and airborne dust) can be assumed to be insignificant. Furthermore, concentrations of chemicals in surface water were very small, so exposure via drinking water is also assumed to be negligible. Consequently, the equation reduces to:

Total Dose = [food] * consumption rate + [soil] * incidental soil consumption rate

CRA uses species-specific ingestion rates from data supplied in USEPA (1993a) or other sources (e.g., Baron et al., 1999), when available. If specific ingestion rates were not available, CRA estimated rates from consumption-body mass (allometric) models as per USEPA (1993a). CRA based body weights and ingestion rates used for the measurement receptors on the adult breeding female and are as presented in Table 4.7.

4.3.7 SOURCES OF TOXICITY REFERENCE VALUES (TRV)

Once exposure is estimated with the food chain models described above, the estimated exposure is then compared to a TRV. As recommended by USEPA (1997b), TRVs used in the SLERA are NOAELs (no observed adverse effects levels). These are doses of a chemical shown to have no ecological effects on an organism. When the estimated exposure is divided by the TRV, it produces an SQ. As before, SQs less than 1.0 indicate that that chemical is unlikely to cause impacts. SQ values greater than 1.0 indicate that the potential for risk cannot be dismissed with the current analysis and data. In general, CRA used TRVs from Sample et al. (1996), a widely used source. CRA used other sources when no values were available from Sample et al. The TRVs and their sources are listed in Table 4.8. CRA used these TRV values without modification for body size or metabolic rate. Food chain exposure to the two chlordane compounds and the three

19 Relative absorption efficiency refers is the absorption efficiency of a compound in a medium, for example soil, compared to that in the original toxicological studies. In general, this refers to the relative absorption of a compound in soil compared to that in food.

forms of endrin were assessed as total chlordane and total endrin, respectively, in which total exposure was equal to the summed exposure of the different forms.

4.3.8 ESTIMATION OF COPEC CONCENTRATIONS IN PREY

The following methods were used to estimate COPEC concentrations in prey.

4.3.8.1 ESTIMATION OF COPEC CONCENTRATIONS IN WORMS

Soils at the Site contain a number of COPECs, some of which will also bioaccumulate in soil invertebrates (e.g., worms) and potentially pose risk to their predators. CRA modeled potential food chain exposure to most metals, PCBs, and TCDD based on Oak Ridge National Laboratory (ORNL) regression models for earthworm bioaccumulation (Sample et al., 1998a)[20]. This is a conservative assumption because earthworms tend to have higher bioaccumulation rates of soil chemicals than other soil macrobiota and herbivorous insects. If no ORNL regression models were available, then CRA based worm concentrations on uptake factors presented in Sample et al. (1998) or other sources[21]. These models and uptake factors predict dry-weight concentrations in worms. These were converted to wet-weight worm concentrations by dividing by 6.25, based on the USEPA (1993) data that worms are 84 percent water[22]. The final estimated concentrations are presented in Table 4.9.

Bioaccumulation of PAHs by worms was based on empirical data produced by a number of authors. On average, the empirical data suggest that worms have about 10% of the PAHs as the soil that they inhabit (see Appendix F). CRA could not locate any information on worm bioaccumulation of phthalates. However, like the PAHs, phthalates are readily metabolized by a number of taxa (Staples et al., 1997; Mackintosh et al., 2004). Thus, CRA assumed the worm bioaccumulation of phthalates to be similar to that observed with PAHs. That is, CRA assumed worm concentrations of phthalates to be 10% of soil concentrations.

---

20 The ORNL models are based on studies in which the worms were allowed to void their gut contents; thus, the estimated concentrations pertain to worm tissue alone. Potential exposure to soil in the worm's gut is considered with the consumption of incidental soil ingestion. See Section 4.3.

21 Antimony bioaccumulation in worms and mammals was based on results presented in Ainsworth et al. 1990. Earthworm bioaccumulation of barium and thallium were based on data presented in Beyer and Stafford (1993) and Nahami et al. 2009, respectively.

22 If the worm is 84 percent water, the dry-weight mass is 16 percent of the total. Total wet weight is therefore 100 percent/16 percent, or 6.25 times dry weight.

4.3.8.2 ESTIMATION OF COPEC CONCENTRATIONS IN SMALL MAMMALS

Once bioaccumulated by rodents and other small prey, COPECs in Site soils may impact top predators feeding in these areas. CRA estimated bioaccumulation of soil COPECs by small vertebrate prey with ORNL regression models [from Table 8 of Sample et al. (1998b)]. These equations relate dry weight soil concentrations to dry-weight concentrations in small mammals. CRA then applied these values to the soil COPECs (Table 4.9) and converted to wet-weight rodent concentrations with the assumption that rodents are 75% water. For metals with no ORNL regression equations or uptake factors, CRA assumed small rodents to have the same concentrations as worms.

Several initial COPECs have no ORNL models for estimating small mammal concentrations, and thus these concentrations were estimated using other methods. For example, CRA assumed wet weight PCB and pesticide concentrations in small vertebrate prey to be 10 percent of soil concentrations. This estimate is based on bioaccumulation of difficult-to-metabolize chlorinated organics observed in a number of ecosystems (Appendix G).

Similarly, no reliable bioaccumulation models exist for estimating PAHs and phthalates concentrations in small vertebrate prey. However, both groups of compounds are readily metabolized by vertebrates. For example, data provided by Broman et al. (1990) indicate that PAH concentrations in eider ducks are about 1/10th the PAH concentrations in their food. Similarly, fish tend to have about 1/10 or less the PAH concentrations of their prey (Thomann and Komlos, 1999). Phthalates are also readily metabolized by vertebrates (e.g., see ATSDR, 2002). Thus, the concentrations of PAHs and phthalates were assumed to be 1/10th those found in worms. Note that this is conservative assumption because it assumes that small mammals are primarily worm eaters. In fact, the bulk of small mammal prey is herbivores, whose concentrations of PAHs and phthalates should be much lower that obligate worm eaters.

4.3.8.3 COPEC CONCENTRATIONS IN QUARRY POND AQUATIC BENTHOS/ADULTAQUATIC INSECTS

As a first choice, CRA predicted the concentrations of COPECs in aquatic insects from regression models produced by ORNL (Bechtel Jacobs 1998). CRA used models based on all data (depurated and non-depurated) from Table 3 of the ORNL reference. The

ORNL models predict dry-weight concentrations. These were converted to wet-weight benthos concentrations by assuming that benthic invertebrates were 75 percent water (Table 4.10).

CRA predicted PAH, PCB, and pesticides (total endrin, total chlordane) concentrations in aquatic benthos empirical results from Tracey and Hansen (1995). Tracey and Hansen present empirical biota-to-sediment accumulation factors (BSAF) values normalized to organic carbon (OC) in the sediments and lipid in the benthos. Median BSAFs for PAHs, PCBs, and pesticide concentrations were 0.29, 1.1, and 1.8, all on a gram lipid per gram OC basis. Organic carbon was not measured in the deep on-Site sediments that contained PAHs, PCBs, and pesticides. However, a relatively low value of 2 percent organic carbon is a reasonable assumption for these ponded sediments[23]. Aquatic invertebrates have lipid levels of about 2.0 percent (Oliver and Niimi, 1988). In this case, the lipid and organic carbon concentrations cancel each other, and the final BSAFs for PAHs, PCBs, and endrin would be 0.29, 1.1, and 1.8. Little information could be found on the aquatic bioaccumulation of the phthalates, although they are known to be metabolized by numerous taxa. Thus, benthic concentrations of phthalates were assumed to be similar to PAH concentrations.

Although CRA retained low and medium molecular weight PAHs (e.g., anthracene, naphthalene, and flouranthene) as sediment COPECs based on their potential additive toxicity to benthos, CRA considered only high molecular weight PAHs in terms of food chain effects. This is because the lower molecular weight PAHs are much less toxic (e.g., see USEPA 2007b) and unlikely to cause risks via bioaccumulation pathways.

4.3.8.4 ESTIMATION OF COPEC CONCENTRATIONS IN QUARRY POND FISH

CRA did not retain COPECs based on surface water data. Accordingly, the only pathway of exposure to fish-eating wildlife from sediment COPECs will be the bioaccumulation pathway from sediments to benthos to benthos-eating fish. This two-step bioaccumulation process will limit potential exposure to most of the sediment COPECs. Most of the sediment COPECs, notably the PAHs and phthalates, are readily metabolized by vertebrates and some invertebrates and, thus, generally become less concentrated in upper levels of food chains (MacIntosh *et al.*, 2004; Thomann and

23 According to descriptions, both samples contained noticeable organic matter. Sample S-15 was described as "fines with sandy silt with organic humus (intermixed), brown in color". Sample S-16 was described as "very fine sediment, thick consistency, marble brown and black. Organic debris (leaves and weeds)."

Komlos, 1999). Of the sediment COPECs, only PCBs and dieldrin, and possibly endrin and chlordane, have the potential to biomagnify in food chains (i.e., increase in concentration with passage up the food chain). Consequently, CRA considered only PCBs, dieldrin, endrin, and chlordane were considered as a potential risk to piscivores.

CRA estimated concentrations of dieldrin, endrin, chlordane, and PCBs in fish with empirical BSAF by Tracey and Hansen (1995). As noted above, they determined the median BSAF values, for fish consuming benthic invertebrates, to be about 1.1 for PCBs and 1.8 for pesticides. Both values are normalized to body lipids and sediment organic carbon. Warm water forage fish should have lipid levels of about 6 percent or less (USEPA, 1995b). Based on the previous assumption that sediments are 2 percent organic carbon, these parameters produce BSAF values of 3.3 for PCBs and 5.4 for dieldrin, total endrin, and total chlordane.

These are likely conservative estimates for fish prey from the Quarry Pond. In addition to fish foraging on benthic invertebrates of soft-sediments, the Quarry Pond will contain forage fish consuming prey from less contaminated microhabitats. Prey from these other microhabitats - the hard rock benthos, epiphytic invertebrates, and pelagic zooplankton - are all effectively water column species that will have lower COPEC concentrations than benthos from the soft sediments.

4.3.9 RESULTS OF SCREENING OF BIOACCUMULATIVE COPECS WITH FOOD CHAIN MODELS

The results of the food chain models are presented in Tables 4.11 through 4.14. The estimated risks to top predators, in both terrestrial and aquatic systems, are negligible for almost all COPECs. This is generally true even when exposure is estimated with the 95% UCL and very conservative exposure assumptions (Tables 4.13 and 4.14) The exceptions to this are the following: the 95% UCL exposures to barium and copper for the fox and copper and lead for the red-tailed hawk. For the heron, UCL exposure for PCBs was about twice the NOAEL. In all cases, however, estimated exposures at the average concentration were less than problematic levels, even when the following other conservative aspects were retained: 100 percent residency, 100 percent consumption of contaminated food, 100 percent relative absorption of COPECs in ingested soil, and comparison to NOAELs.

The conservative default assumption of 100 percent residence at the Site greatly exaggerates exposure for both the fox and hawk. Foxes and hawks have foraging ranges of about 1,000 and 2,300 acres, respectively. By comparison, the terrestrial habitat is less

than about 30 acres, such that likely residence and exposures to both predators will be overestimated 30-fold or more. Herons forage over smaller areas, but they migrate south for about half the year (Borror, 1950), reducing exposure by about half. Similarly, the assumption of 100 percent relative absorption for COPECS in soil greatly exaggerates likely exposure to the hawk and fox. Soil bound metals are generally considerably less bioavailable than the soluble salts typically used in toxicological experiments. This is important because incidental soil ingestion makes up about 80 percent and 99 percent of the estimated lead and copper exposure, respectively. In view of these factors, ecological risks to top terrestrial predators and fish-eating wildlife from all COPECs in soil and sediments can be dismissed an unlikely.

Similarly, risks to aerial insectivores feeding on insects emerging from the Quarry Pond were below potentially problematic levels except for PCB exposure to the swallows. These were nominally above the NOAEL doses when estimated at both the UCL and average sediment concentrations. Again however, estimated exposures would fall to safe levels (e.g., about NOAELs) if more realistic assumptions about residency and diet were made. As with herons, swallows migrate south for about 6 months of the year (Borror, 1950). Moreover, they also forage over wide areas and will eat a mixture of terrestrial and aquatic prey from both the Quarry Pond and nearby GMR (Baron et al., 1999).

In contrast, potential ecological risks cannot be easily dismissed for worm eating-wildlife. Estimated exposures to worm-eating wildlife were greater than the NOAELs for a number of compounds. Moreover, many of these exceedances occurred irrespective of whether exposures were estimated with the 95% UCL or the mean soil concentrations. Further, estimated exposures for some COPECs and receptors - antimony and copper for mammals and lead and zinc for the birds - were 10 or more times greater than NOAELs. Since LOAEL values for most of these chemicals are about 10 times greater than NOAELs, these greater than a 10-fold exceedance suggests that estimated exposures are in the range of those that caused effects on laboratory animals.

At the same time, it should be remembered that the exposure assessment contains several conservative assumptions. Notably, the exposure assessment assumes that shrews eat only worms, that woodcocks are resident all year long, and for both receptors, that compounds in soil are 100 percent as bioavailable as those in the lab experiments. The implications of these and other conservative assumptions on potential risk will be assessed in a subsequent section. At this point, however, several metals and organics chemicals are retained as initial COPECs based on their potential effects on worm-eating predators.

4.4 REFINEMENTS TO SCREENING ANALYSES

As described in Section 4.1, the initial steps in the ERA process are intentionally very conservative so as to avoid false negatives, instances where risks are dismissed although impacts are likely. However, this conservatism often can leads to multiple instances of false positives. In the following sections, CRA examines the retained COPECs with less conservative assumptions for a more accurate assessment of the actual potential for impacts to ecological receptors.

4.4.1.1 RESCREENING OF COPECS IN SEDIMENTS/RISKS TO BENTHOS

In the initial screening of sediment COPECs versus ESVs protective of aquatic benthos, SQ values greater than 1.5 were generated with the maximum concentration of several compounds (Table 4.2). However, these SQ values were generally based on TEC values, or for the PAHs, USEPA's conservative ESB model. Both types of ESV are, intentionally, very conservative ESVs that are designed to screen sediments for lack of toxicity. Exceedances of the TEC or ESB do not necessarily imply that impacts to benthic life are expected.

MacDonald et al. (2000) calculated PEC (Probable Effects Concentrations) from the same datasets as TEC values. According to those authors, the PEC values are concentrations "above which adverse effects are expected to occur more often than not." Therefore, CRA re-screened the COPECs retained after the initial screening using these PECs. As shown in Table 4.15, a few of the PAHs exceeded the individual PEC values in the more contaminated sample (S-16), but total PAHs were not greater than the PECs. The other compounds, the PCBs and pesticides, were less than the PECs in both sediment samples. Thus, this re-analysis suggests that risks to aquatic benthos are somewhat unlikely, especially at the less contaminated location.

4.4.1.2 RESCREENING OF COPECS IN SOIL/RISKS TO WORM-EATERS

In the initial screening of risks to worm-eaters, several compounds had SQ values greater than 1.0. CRA re-screened these COPECs using less stringent TRVs: LOAELs and the Maximum Acceptable Threshold Concentration (MATC), set equal to the median of the LOAEL and NOAEL. As shown in Tables 4.16 and 4.17, there are still exceedances of both doses for a number of COPECs. Based on the more conservative MATC and less conservative LOAEL, four metals (antimony, barium, copper, and lead)

pose the primary risks to worm-eating wildlife. Applying more realistic assumptions about residency (due to migration, only about 6 months of the year for the woodcock) and diet (actually less than half worms for the shrew) would reduce exposure to both vermivores by about half. Thus, risks from arsenic, thallium, zinc, and butyl benzylphthalate can be dismissed with available information as likely not significant (Tables 4.16 and 4.17). Moreover, it should be noted that exposures to the remaining metals - antimony, barium, copper, lead - are dominated by incidental soil ingestion, making total exposure very sensitive to the assumption of 100 percent relative absorption efficiency. Especially for the first three metals, exposure also depends on small number of hot spots that dramatically inflate the 95% UCLs compared to mean concentrations.

4.5. ASSESSMENT OF EROSION RISKS TO GMR

As described previously, much of the Site is within the 100-year floodplain, and other areas, most notably the bank, flood more frequently. The Site's surface soil and underlying waste contain persistent chemicals (e.g., PAHs, PCBs, heavy metals) along with generally low concentrations of pesticides. Thus, there is a potential that past flooding of the Site has transported surface soil and related contaminants to the GMR, where these Site-related chemicals pose current risk (USEPA, 2007a). Future flooding could likewise cause additional erosion of Site-related chemicals into the GMR, so this potential exposure pathway poses a possible future risk.

The available sediment quality data provide information about potential for future releases from OU1 to the GMR. The 1995 sediment concentrations represent releases from the Site, and upstream sources, in the past, prior to any sort of erosional control. In fact, evidence of past releases is somewhat of a worst-case predictor of future releases since past releases occurred prior to and in the beginning the development of the dense on-Site vegetation.

Ohio EPA collected sediment samples from the adjacent GMR in 1995, and the results may indicate past releases from the Landfill to the GMR (USEPA 2007a; ATSDR, 2008). These samples were taken at three locations alongside the Site. The most upstream sample, S-19, is roughly at the same latitude as the middle of the Valley Asphalt property. Continuing downstream, S-17 is about even with the former air curtain destructor, and S-18 is about the same latitude as the Quarry Pond. None of these samples is a true upstream sample, since all are downstream of some waste areas. Notably, location TT-20, taken in the artificial bank upstream of all three sediment

samples, contained elevated concentrations of some compounds, notably lead and barium, buried 7 ft deep in the bank.

Consistent with the Site as a source, all three sediment sample locations had moderately elevated concentrations of PAHs and, detectable, but low concentrations of pesticides. Assuming that organic carbon concentrations were 2 percent, the summed PAH quotients were moderately greater than conservative screening levels (Table 4.18). The pesticides were also found at concentrations that were slightly greater than the conservative USEPA Region V screening levels. In terms of concentrations, these results are similar to those found in the Site's surface soil and Quarry Pond sediments.

On the other hand, the following evidence suggests that the Site was not the primary source of chemicals measured in the GMR sediments in 1995. In contrast to the Site soil, PCBs were not detected in the samples collected from the GMR sediments, and the metals concentrations, while greater than background, were not, like the Site's soil, elevated above concentrations that would likely pose risk to benthic invertebrates (Table 4.2). Also consistent with an upstream source, elevated concentrations of PAHs and low, but detectable concentrations of chlorinated pesticides have been found in sediments upstream and downstream of the Site (Ohio EPA, 1997). Upstream and downstream sediments samples also resembled the adjacent GMR sediments in terms of reasonably low metals concentrations and generally non-detectable PCB concentrations (Ohio EPA, 1997). Lastly, while none of the three Ohio EPA samples is truly an upstream or downstream sample, intuitively, one would expect the more downstream sample locations better reflect Site influences than the most upstream sample (S-19). In fact, however, the greatest PAH concentrations were found at the two upstream samples: S-19 had a total PAH concentration of 16.6 mg/kg, while the middle sample, S-17, had 21.0 mg/kg total PAHs. The most downstream sample, S-18, had the smallest total PAH concentration of 8.5 mg/kg. In short, the concentrations of chemicals in adjacent GMR sediments look more like upstream and downstream samples than those, on average, found in the Site's surface soil.

None of these observations above are definitive. The differences in PAH concentrations upstream vs. downstream could be due to other differences, such as organic carbon content and sediment binding capacity, that co-occurred with sediment locations. Nonetheless, the weight of evidence suggests that the Site is not a significant source of the chemicals measured in sediment in the adjacent GMR.

The available information from adjacent sediments also suggests that the Site was not a significant contributor, in a toxicological sense, to nearshore sediment contamination in the GMR. Although PAH concentrations in the adjacent GMR sediment were greater

than more conservative ESVs, the total PAH concentrations in the samples collected from all three locations were still less than the Probable Effects Concentration (22.8 mg/kg), above which toxicity is expected. Moreover, sampling of the macroinvertebrates and fish in the river upstream of, adjacent to, and downstream of the Site showed that aquatic biota populations were in good condition (Ohio EPA, 1997), further evidence that significant sediment toxicity was not occurring adjacent or downstream of the Site.

Other available evidence also suggests that future erosion risks are not likely to be significant in terms of concentrations or potential toxicity. First, the Site is mostly on the inner edge of a river meander, where flow velocities are slower and sediment deposition tends to outweigh erosion. On average, then, flooding events are more likely to cover than to erode surface soil at the Site. Second, while the contaminated artificial bank area is more likely to flood than the middle of Site, the bank is also heavily vegetated and, thus, resistant to erosion. In addition to suppressing erosion, dense riparian vegetation also slows current flow and encourages sediment deposition (Hershey et al. 1994), further enhancing the propensity for deposition inherent in the Site's location in the meander. Compared to the artificial banks, the middle of the Site would appear to be even more resistant to erosion and more prone to capture of sediments, rather than acting as a source of suspended sediments during a flood event. In a major flood event, the middle of the Site will be a heavily vegetated, low lying backwater area in which sediment deposition, rather than erosion, would likely predominate.

Lastly, the concentrations of contaminants found in samples collected from the Site are generally not sufficiently high to be able to affect sediment concentrations in a biologically meaningful manner. Flooding sufficient to erode significant amounts of material from the Site would inevitably coincide with flooding and erosion from other parts of the watershed. Thus, any material eroded from the Site and carried into the River would be mixed with all the suspended material carried during that flood event. Given that much of the watershed is highly erodible agricultural areas planted in row crops, the sediment burdens in major storms are appreciable and would overwhelm the effects, on final concentrations, of any inputs from the Site[24].

---

24 The suspended sediments in the GMR were estimated at the gauging station at Sydney, Ohio, between 1967 through 1974. Over this 7 year period, sediment loading exceeded 10,000 tons per day about once per year. The watershed at this location is about 1/5th of the GMR at the Site, so the available data suggest that the GMR at the Site would carry about 50,000 tons/day of sediment during a one-year flood. By comparison, the undeveloped area of erodible soil at the Site is about 20 acres. Assuming as a worst-worst case, that a cm of top soil is eroded from 20 acres would produce a total loading of about 1,000 tons of contaminated soil.

Thus, the weight of available evidence suggests that erosion of the Site's surface soil during past and future floods is not likely to cause significant ecological risk to the biota of the GMR. The sediment data from 1995 suggest that the Site was not likely a significant source, in terms of chemical mass or potential toxicity, to GMR sediments. Future erosion potential from the Site should be even less than in the past because of the ongoing naturalization and growth of vegetation on the Site. Ecologically significant releases of contaminants from the Site's surface soil to the GMR are also unlikely because of 1) low potential for erosion from the Site and 2) the low potential for Site soil, if eroded, to meaningfully affect in-stream sediment concentrations. In short, the existence of somewhat elevated concentrations of PAHs, PCBs, and heavy metals at the Site does not constitute strong evidence of past or future risk to the GMR.

At the same time, the qualitative analyses presented above are limited. Further sampling of upstream and downstream areas will permit a better assessment of the source of chemicals in current GMR sediments. Additional sampling will also address whether current concentrations in adjacent sediments actually pose risk to benthic invertebrates in the GMR. Similarly, more quantitative analyses will refine the qualitative assessment of potential erosion during flooding events provided above. CRA understands that such analyses will be completed as part of the OU2 RI.

4.6 RISK CHARACTERIZATION

Except for risks to worm-eating wildlife, the available evidence suggests that ecological risks to most other components of the ecosystem can be dismissed as unlikely. In some cases, however, the available evidence is limited, reducing the certainty about the conclusions.

Groundwater discharging to both the Quarry Pond and the GMR is unlikely to cause ecological impacts. The groundwater has been intensively sampled, so this conclusion is reasonably certain. Similarly, top predators feeding on small rodents living at the Site are unlikely to be impacted by chemicals in soil. This conclusion also is certain given the 1) generally limited concentrations of bioaccumulative chemicals at the Site and 2) the Site's small size compared to these predators' foraging areas. Thus, these ecological risks can be dismissed with available data.

Risks to water column aquatic biota of the Quarry Pond can also be dismissed with available data. This conclusion is somewhat uncertain due to the very limited sampling of surface water. However, the limited surface water sampling is supported by more extensive sampling of inflowing groundwater, which supports the conclusion that

surface water concentrations are safe. Similarly, risks to aerial insectivores feeding on insects emerging from Quarry Pond sediments can also be dismissed. Confidence in this conclusion is limited since only two sediment samples from the Pond were taken and assayed for bioaccumulative chemicals. On the other hand, excessive exposure to aerial insectivores was not found even with highly conservative assumptions about food-chain exposure.

The available evidence also suggests that the Site poses no risk to the GMR via erosion of landfill material during major flood events. This conclusion is, however, based on limited sample data and a general qualitative understanding of typical flood plain dynamics. Thus, this conclusion should be considered uncertain, especially considering that potential effects would occur to a important public resource, the GMR.

It is uncertain whether chemicals in Quarry Pond sediments pose risk to benthic invertebrates. There are only two samples of Quarry Pond sediments with analyses of typical sediment contaminants (SVOC, metals, PCBs, and pesticides), and observed chemical concentrations in one of the two samples were greater than safe concentrations for benthic invertebrates. According to these two samples, the risks to benthic invertebrates could be dismissed in half of the bottom area. Although above conservative screening values, the concentrations of chemicals in the other sample were generally lower than those associated with likely toxicity. However, given the small number of samples and uncertainty about this one sample, risks to benthic invertebrates in the Quarry Pond cannot be dismissed with available information.

Risks to biota inhabiting the temporary ponds could not be assessed because no sediment or water samples have been taken. Therefore, ecological risks in these areas cannot be dismissed. It should be noted, however, that ecological risks will be limited by the small size, unnatural nature, and ephemeral nature of these ponds.

Most clearly, risks to worm-eating wildlife cannot be dismissed with available information. Estimated exposures of worm-eating predators to several metals – notably antimony, barium, copper, and lead – were greater than NOAELs, and generally greater than MATCs and LOAELs when estimated using the 95% UCL concentrations. These analyses contained some levels of uncertainty, so current information is insufficient to address whether impacts to worm-eaters are likely. Nonetheless, risks to the worm eaters cannot be dismissed with current information.

Although not specifically considered, potential ecological risks to most herbivorous terrestrial vertebrates (e.g., voles, rabbits, deer mice, quail, etc) are probably not significant. In general, the soil-to-plant bioaccumulation pathway is a considerably less

efficient bioaccumulation pathway than that associated with soil-to-worms. In addition, incidental soil ingestion is typically much smaller (e.g., 1/5th) for herbivorous vertebrates than that for worm eaters because the soil in the worm itself probably represents that primary source to vermivores (USEPA, 1993, Beyer et al., 1994). In addition, most of the herbivorous vertebrates consume less food per unit body weight per day than the shrew and woodcock. Hence, their daily exposure of chemicals in food and incidental soil is further reduced. In total, then, estimated exposures to herbivorous vertebrates are likely 1/5th to 1/10th of those estimated for vermivores in Tables 4.11, 4.16, and 4.17.

4.7 UNCERTAINTY ANALYSIS

This SLERA follows the methodology recommended by USEPA (USEPA, 1997b). Because the USEPA intent is to avoid underestimating risk, CRA used conservative methods in the risk assessment. For example, toxicological benchmarks were based on the most sensitive species, and exposure analyses were based on conservative assumptions. For example, with respect to predators of soil invertebrates (the shrew and woodcock), the exposure assessment assumes that these predators eat only earthworms. This is a conservative assessment because earthworms are highly exposed soil invertebrates (i.e., they consume soil directly) and tend to have worst-case concentrations of soil contaminants. In addition, the food chain analyses assumed 100 percent relative absorption of COPECs from food and incidentally ingested soil, and 100 percent residency of species on the Site. Finally, risks were initially screened against NOAEL values. All of these factors will tend to exaggerate risk.

A source of considerable uncertainty is bioavailability of the compounds measured in soil and sediment. The upper soil layers at the Site tend to be sandy, which might suggest greater bioavailability of many COPECs. On the other hand, the risks associated with some COPECs, notably copper and antimony, are due to a small number of very localized concentrations, suggesting that the soil is contaminated with pieces of metal (i.e., shavings, cuttings). Pieces of cuttings and shavings of metal will likely have very low bioavailability or simply be too large of particles to enter the critical earthworm-to-vermivore food chain.

Equally important, much of the landfill material consists of partially burnt material such as ash, cinders, and partially burnt wood. The black material in the foundry sand is also likely partially burnt organic matter (i.e., soot). Together, these incomplete combustion products are called "black carbon." Black carbon may have significantly higher binding capacity for metals and hydrophobic substances (USEPA 2003c; Cornelissen et al. 2005;

Shrethra et al. 2010), than organic carbon derived from biological degradation of organic matter. Notably, much of the PAHs at the Site are likely associated with this black carbon and, thus, have much lower bioavailability and potential toxicity than assumed with default conservative methods.

On the non-conservative side, there were some exposure pathways – such as dermal absorption and inhalation - that were not considered in the wildlife exposure models. These exposure pathways are not generally considered in ecological risk assessments because they are assumed to pose insignificant risk and because these exposure pathways are difficult to estimate (Ohio EPA, 2003; USEPA, 2004c).

Lastly, there is uncertainty due to limitations in the available data. Thus, for example, sampling of the Quarry Pond water samples were analyzed for VOCs only, which, given their high volatility, are rarely problematic to water column biota. Quarry Pond sediment data are also very limited, and the analyses of deep water sediments did not include assessment of organic carbon and alkylated PAHs (as recommended by USEPA 2003c). More significant are data gaps for assessing ecological risk to Large and Small Ponds from Site-related chemicals. Neither the sediments nor the water column of these areas were sampled at all. However, in view of the limited area and habitat values of these ponds, it is uncertain whether these data-gaps significantly affect the SLERA.

4.8 SCIENCE-MANAGEMENT DECISION INPUT POINT

At this point, the available evidence suggests that ecological risks are unlikely except for worm-eating wildlife, primarily from a number of metals in surface soil. According to food chain models, these species could face excessive exposure, even under less conservative exposure scenarios. Nonetheless, the available information and SLERA results are not sufficient to determine whether unacceptable ecological risk occurs and, if so, whether remediation is warranted. The uncertainty is due to both technical and policy issues. With respect to the former, most of the estimated exposure to worm-eating wildlife is due to incidental soil ingestion. This exposure may be greatly overestimated by the assumption of 100% relative absorption efficiency. In addition, the bulk of exposure for most metals is typically due to a small number of hot spots. Contamination may be too localized to have any effect on the population of shrews and woodcocks foraging on worms at the Site. Moreover, the risks pertain to a small part of the terrestrial ecosystem. Population level effects on other ecological guilds (herbivorous and omnivorous vertebrates) are less likely and for top predators, very unlikely. In short, it is uncertain whether populations of vermivores are likely to be impacted, and, if so, whether the rest of the ecosystem would be affected at all. It is also

uncertain whether either conclusion would constitute unacceptable risk. The terrestrial area is mostly private land, and is neither very productive nor unique ecological habitat. It could be developed in the future as commercial/industrial. In the latter case, the ecological habitat and most of the exposure, and risks, to ecological receptors would disappear.

In short, while risks to worm-eaters cannot be dismissed with available information, whether these risks are unacceptable depends, in part, on the potential for future development, policy inputs from the risk managers, and, potentially, further sampling and analyses to close data-gaps.

For example, remediation of surface soil could be required based on protection of human health, which also found potentially unacceptable risks due to some metals in surface soil. Thus, remediation for these metals might reduce ecological exposure to nominal levels. As noted above, metals concentrations may also be due, in part, to background metals concentrations in native soils and groundwater. The completion of a background metals study would assist in identifying those risks due to the presence of waste and soil contamination at the Site.

Furthermore, risks of contamination through erosion to the GMR and from food chain contamination to worm-eating wildlife are both dominated by a small number of hot spots. Risk management about the former could moot risk decisions about the latter.

If uncertainty about potential risks to worm-eating wildlife is not mooted by policy decisions and/or remediation to protect other receptors, the ecological risk assessment should proceed to Baseline Ecological Risk Assessment (BERA). As per USEPA guidance, which is described in Section 4.1 above, initial stages of the BERA require collaboration between risk managers and risk assessors in the development of a sampling plan and the EPA-specific DQO process (USEPA 1997). The additional information gathered in this sampling would then help determine whether risks to worm-eating wildlife were unacceptable or not.

There is uncertainty about whether some compounds, notably PAHs, cause impacts on benthic invertebrates inhabiting soft-sediments of the Quarry Pond. Based on only two samples, one half of the bottom sediments would be judged likely to be non-toxic. The other sample would suggest that half of soft-bottom sediments would have concentrations that are too high to dismiss toxicity but not sufficiently high to conclude that toxicity is likely. Although the question of potential toxicity to benthos could be addressed with additional sampling, this additional sampling is not recommended based on the following:

- First, the biological significance of toxicity to part of the soft-sediment benthos in the Quarry Pond is uncertain. Biological production in the Quarry Pond is likely dominated by other microhabitats and food chains, i.e., those associated with pelagic (e.g., open water), and biota attached to hard rock, sandy bottoms, and aquatic vegetation. Biota in these microhabitats face exposure largely or totally to contaminants in surface water, rather than sediments, and concentrations of contaminants in Quarry Pond surface water are likely less than toxic concentrations.
- Second, even if PAH concentrations in soft-sediments (in the Ohio EPA 1995 sample or in future samples) were sufficient to cause some toxicity this observation would not likely spur remediation because these concentrations should attenuate naturally. Ongoing inputs of COPECs to the Quarry Pond are dominated by groundwater, which has low levels of COPECs. Residual levels of chemicals in bottom sediments will likely, therefore, wane over time. Quarry ponds are typically nonproductive aquatic systems because they generally lack essential nutrients and the diverse physical structure critical to development of aquatic resources. Hence, the Quarry Pond may not be a critical or important ecological resource upon which SLERA should focus (USEPA, 1997). However, the available evidence suggests that the Quarry Pond is a functional aquatic ecosystem. The Pond is fished, which is evidence of reasonably complete and functional aquatic food chains. Anglers do not return to unproductive waters.

The Site might also pose risks to the aquatic habitat of the GMR. However, assessment of GMR sediment samples collected in 1995 suggests that the Site was not an ecologically significant source of chemicals in the past, when erosion potential was higher. In addition, a qualitative analysis of future erosion risk from the Site to the GMR suggests that the Site does not pose an unacceptable future risk to the GMR. However, the latter analysis is a qualitative analysis based on a general understanding of the Site and floodplain dynamics and assumes that vegetation on the Site is left in place in future. Should vegetation be removed, the potential for erosion will increase. Thus, the conclusion is not without some uncertainty.

While additional characterization of the Site would reduce uncertainty about the nature and extent of contamination, it would not necessarily be useful. For example, the uncertainty about surficial sediment concentrations in the Large and Small Ponds would be mooted if the Site is remediated to address human health concerns, with a cap or layer of clean soil. Alternately, the Ponds could both be eliminated totally if the Site is re-developed. Further characterization may also not be necessary if the risk managers conclude that these small, unnatural wetlands are not critical habitats and even if a no

action alternative is warranted and the area is deemed critical habitat, sampling of the aquatic community would provide a better index of ecological risk than additional analysis of bulk sediment chemistry.

5.0 SUMMARY AND CONCLUSIONS

5.1 HHRA SUMMARY/CONCLUSIONS

Based on the RME results of the HHRA, CRA has arrived at the following conclusions:

Soil Gas

- The cancer risk and calculated HI are less than the target cancer risk range (1×10^{-6} to 1×10^{-4}) and the target HI (i.e., a non-carcinogenic HI of 1) based on the ambient air inhalation exposure to soil gas by trespassers, industrial/commercial workers, and construction/utility workers, and indoor air inhalation exposure to soil gas by industrial/commercial workers.

Surface Soil

- The cancer risk and calculated HI are less than the target cancer risk range (1×10^{-6} to 1×10^{-4}) and the target HI (i.e., a non-carcinogenic HI of 1) based on the trespasser exposure to surface soil.
- The cancer risk is less than the target cancer risk range (1×10^{-6} to 1×10^{-4}) based on the industrial/commercial worker exposure to surface soil; however, the calculated HI of 3.2 was greater than the target HI of 1 based on the industrial/commercial worker exposure to surface soil. The calculated HI of 3.2 primarily resulted from ingestion and dermal contact exposure to arsenic and copper in surface soil; however, only copper had a HQ greater than the target HI of 1.
- Metals concentrations may also be due, in part, to background metals concentrations in native soils. Areas of higher metals concentrations are most likely due to anthropogenic sources. The completion of a background metals study would assist in identifying those risks due to the presence of metals contamination from historic Site activities.

Surface and Subsurface Soil

- The cancer risk is less than the target cancer risk range (1×10^{-6} to 1×10^{-4} for the construction/utility worker exposure to surface and subsurface soil; however, the calculated HI of 2.8 was greater than the target HI of 1 based on the construction/utility worker exposure to surface and subsurface soil. The calculated HI of 2.8 primarily resulted from ingestion and dermal contact exposure to antimony, cobalt, copper, and Aroclor-1254, and inhalation exposure to manganese

and mercury in surface and subsurface soil; however, only copper had a HQ greater than the target HI of 1.

Groundwater

- The cancer risk and calculated HI are less than the target cancer risk range (1×10^{-6} to 1×10^{-4}) and the target HI (i.e., a non-carcinogenic HI of 1) based on the off-Site resident and industrial/commercial worker exposure to indoor air (from groundwater).
- The cancer risk of 2.0E-03 was greater than the target cancer risk based on the off-Site resident exposure to on-Site groundwater (household use). The cancer risk of 2.0E-03 primarily resulted from ingestion exposure to vinyl chloride and arsenic, and dermal exposure to Aroclor-1260 in on-Site groundwater. The calculated HI of 7.9 was greater than the target HI based on the off-Site resident exposure to on-Site groundwater (household use). The calculated HI of 7.9 primarily resulted from ingestion exposure to arsenic, cobalt, and manganese in on-Site groundwater.
- Metals concentrations may also be due, in part, to background metals concentrations in native soils and groundwater. Areas of higher metals concentrations are most likely due to anthropogenic sources. The completion of a background metals study would assist in identifying those risks due to the presence of metals contamination from historic Site activities.

Sediment

- The cancer risk and calculated HI is less than the target cancer risk range (1×10^{-6} to 1×10^{-4}) and the target HI (i.e., a non-carcinogenic HI of 1) based on the trespasser, industrial/commercial worker, and construction/utility worker exposure to sediment.

Surface Water

- The concentrations of chemicals within on-Site surface water were non-detect, therefore, there were no COPCs identified for surface water. Surface water is not considered to be a medium of concern at the Site and was not retained for further quantitative evaluation in the HHRA.

5.2 SLERA SUMMARY/CONCLUSIONS

Based on the SLERA, the following conclusion can be made concerning ecological risk.

Groundwater

- Groundwater under the Site is contaminated with moderate levels of VOCs and, infrequently, elevated concentrations of PCBs, PAHs, heavy metals, and pesticides. However, risks from chemicals in groundwater are unlikely and can be dismissed. In general, VOCs pose low potential toxicity to aquatic biota, and were not found in high concentrations near surface waters. The other contaminants - PCB, PAHs, heavy metals, and pesticides – can and often do pose a risk to aquatic ecosystems. However, chemicals were not found in ecologically significant levels in sentinel wells immediately upgradient of the Quarry Pond and GMR.

Surface Soil

- The Site's soil is contaminated with elevated concentrations of heavy metals, PAHs, PCBs, and low concentrations of pesticides. Based on the available information, the SLERA suggests that the potential for ecological risks from contaminants in soil is likely limited to worm-eating wildlife. Even under less conservative scenarios, estimated exposures to a number of metals were greater than NOAELs and sometimes greater than LOAELs and MATCs. However, these estimates are limited by data gaps concerning Site-specific bioavailability; thus, current information is not sufficient to address whether population-level impacts on the vermivores are likely. Given that the presumptive remedy for OU1 includes the installation of a cap, the potential impacts to worms and thus to vermivores will be addressed. Should a cap not be installed in areas of the Site where elevated concentrations of COPECs exist, additional assessment as to the bioavailability of contaminants may be required. Furthermore, metals concentrations may also be due, in part, to background metals concentrations in native soils and groundwater. The completion of a background metals study would assist in identifying those risks due to the presence of waste and soil contamination at the Site.

  At the same time, contaminants in surface soil likely do not pose ecological risks to top predators foraging at the Site. Ecological risks to herbivorous vertebrates are also likely not significant.

If substantial erosion and transport of surface soil to the GMR occurred during major floods, chemicals in surface soil might pose a risk to the GMR's aquatic biota. However, the potential risks from the erosion scenario are not likely to be unacceptable. Total risk from this scenario is the product of the potential effects of an erosion event if it were to occur times the potential for a significant erosion event to occur. Both factors were judged to be small, making the product of the two very small. However, there is some uncertainty about the assessment of the second factor.

Quarry Pond Sediments and Water Column

- In very limited sampling of Quarry Pond Surface water – only VOCs were analyzed - all chemical were non detect. However, this limited sampling of surface water was corroborated by more extensive sampling of upgradient groundwater the primary source of water and chemicals to the Quarry Pond. Thus, ecological risks from VOCs in Quarry Pond water are unlikely and can be dismissed.
- Based again on very limited sampling, Quarry Pond sediments have elevated concentrations of PAHs and some pesticides. These concentrations are probably too low to cause risks to piscivorous wildlife feeding on Quarry Pond fish or aerial insectivores feeding on insects emerging from the Pond. Potential risks of the PAHs and pesticides to benthic invertebrates cannot be dismissed with available information. However, the available information suggest that ecosystem level effects are not likely unacceptable. Additional data are required during the RD process to address this data gap. Consistent with this, the Quarry Pond is currently fished, suggesting that it supports a reasonably health ecosystem.

Water column and sediments of the Large and Small Ponds.

- No samples of the sediments or water column of the Large and Small Ponds were collected; hence, ecological risks to temporary pond species that occupy these habitats could not be assessed. However, total ecological effects will likely be limited by the very small size and habitat values of the two ponds.

6.0 REFERENCES

Ainsworth, N., J. A. Cooke, and M. S. Johnson. 1990. Distribution of antimony in contaminated grassland: 2- small mammals and invertebrates. Environmental Pollution, 65: 79-87.

Anonymous. 1997. National Water-Quality Assessment Program: Great and Little Miami River Basins. USGS Fact Sheet FS-117-97, August 1997. http://oh.water.usgs.gov/miam/Background.html#HDR1

APHA. 1992. Standard Methods for the Examination of Water and Wastewater. 18th Edition.

ASTM. 2002. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, American Society for Testing and Materials, E1739-95 (Reapproved 2002).

ATSDR. 2002. Toxicological Profile for Di(2-ethylhexyl)phthalate (DEHP). Agency for Toxics Substances and Disease Registry. September, 2002.

ATSDR. 2008. Public health assessment for the South Dayton Landfill. Http://www.atsdr.cdc.gov/HAC/pha/SouthDaytonDumpLandfill /South_Dayton_Dump_&%20Landfill%20PHA%209-30-2008.pdf.

Baron, L. A., B. E. Sample., and G. W. Suter. 1999. Ecological risk assessment in a large river-reservoir: 5. Aerial insectivorous wildlife. Environmental Toxicololgy and Chemistry, 18: 621-627.

Bechtel Jacobs. 1998. Biota sediment accumulation factors for invertebrates: review and recommendations for the Oak Ridge Reservation. Bechtel Jacobs Company LLC, Oak Ridge, TN. BJC/OR-112. Available on the Internet at http://www.hsrd.ornl.gov/ecorisk/bjcor-112a1.pdf.

Beyer, W. N. and C. Stafford. 1993. Survey and evaluation of contaminants in earthworms and in soils derived from dredged material at confined disposal facilities in the great Lakes region. Environmental Monitoring and Assessment, 24: 151-165.

Borror, D.J. 1950. A check list of the birds of Ohio, with the migration dates for the birds of Central Ohio. Ohio Journal of Science L. 1-32.

Broman, D., C. N. Naf, I. Lundbergh and Y. Zebuhr. 1990. An in situ study on the distribution, biotransformation and flux of polycyclic aromatic hydrocarbons, (PAHs) in an aquatic food chain (seston-Mytilus edulis – Somateria mollissima) from the Baltic: An ecotoxicological perspective. Environmental Toxicololgy and Chemistry, 9: 429-442.

Call D. J., T. P. Markee, D. L. Geiger, L. T. Brooke, F. A. Vandeventer, D. A. Cox , K. I. Genisot, K. A. Robillard, J. W. Gorsuch, T. F. Parkerton, M. C. Reiley, G. T. Ankley, D. R. Mount. 2001a. An assessment of the toxicity of phthalate esters to freshwater benthos. 1. aqueous exposures. Environmental Toxicololgy and Chemistry, 20:1798-1804.

Call D. J.,T. P. Markee, D. L. Geiger, L. T. Brooke, F. A. Vandeventer, D. A. Cox , K. I. Genisot, K. A. Robillard, J. W. Gorsuch, T. F. Parkerton, M. C. Reiley, G. T. Ankley, D. R. Mount. 2001b. An assessment of the toxicity of phthalate esters to freshwater benthos. 1. sediment exposures. Environmental Toxicololgy and Chemistry, 20: 1805-1815.

Cornelissen, G, O. Gustafsson, T.D. Bucheli, M.T.O. Jonker, A.A. Koelmans, and P.C.M. Van Noort. 2005. Extensive sorption of organic compounds to black carbon, coal, and kerogen in sediments and soils: Mechanisms and consequences for distribution, bioaccumulation, and biodegradation. Environmental Science and Technology, 39: 6881-6895.

Crommentuijn, T., M. D. Polder, and E. J. van de Plassche. 1997. Maximum permissible concentrations and negligible concentrations for metals, taking into account background. Report #601501.001, National Institute of Public Health and the Environment, Bilthoven, The Netherlands.

Dominic, D. F., R. . Ritzi, and K. W. Kausch.. 1996, Aquitard Distribution in a Northern Reach of the Miami Valley Aquifer, Ohio, USA: Part 2. Interpretation of Facies and Geostatistical Results. Hydrogeology Journal, 4(2): 25-35.

Dumouchelle. 1998. Ground-water Levels and Flow Directions in the Buried Valley Aquifer around Dayton, Ohio, September 1993: U.S. Geological Survey Water Resources Investigations Report 97-4255, 1 sheet, scale 1: 100,000

Ecology and Environment, Inc., 1991. Screening Site Inspection Report for South Dayton Dump, Moraine, Ohio. Prepared for United States Environmental Protection Agency.

Efroymonson, R.A., G. W. Suter, B. E. Sample, and D. S. Jones. 1997. Preliminary remediation goals for ecological endpoints. Oak Ridge National Lab ES/ER/TM-162.

Garrison, B. A. 1998. Bank Swallow (Riparia riparia). In The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. http://www.prbo.org/calpif/htmldocs/riparian_v-2.html

HEAST. 1997. Health Effects Assessment Summary Table, July 1997.

Hershey, F., D. Wallace and J. Dwyer. 1994. Forestry strategies to protect floodplain agricultural systems. Talk presented at "Restoration of Aquatic Ecosystems" symposium, The Association of State Wetland Managers, St. Paul, Minnesota, June 20-23, 1994. Available at www.na.fs.fed.us/Spfo/pubs/n_resource/flood/strateg.htm.

Johnson, P. C. and R. A. Ettinger. 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors into Buildings, Environmental Science and Technology, 25(8):1445-145.

Kricher, J. C. and Morrison, G. 1988. A Field Guide to Eastern Forests, Houghton Miffline Company, Boston, Massachusetts.

LSP. 1999. Methods for evaluating application of the coal ahs and wood ash exemption under the Massachusetts Contingency Plan. Available at www.semtechsolutions.com/semservices/coalash/CoalAshWoodAshExemption.pdf

MacDonald D. D, C. G. Ingersoll, and T. Berger. 2000. Development and evaluation of consensus-based sediment quality guidelines for freshwater ecosystems. Archives of Environmental Contamination and Toxicology, 39:20-31.

Mackintosh, C., J. Maldonado, J. Hongwu, N. Hoover, A. Chong, M. G. Ikonomou, and F.A.P.C. Gobas. 2002. Distribution of phthalate esters in a marine aquatic food web: comparison to polychlorinated biphenyls. Environmental Science and Technology, 38: 2011-2020.

MCD. 2002. Great Miami River Watershed Project. USEPA watershed initiative grant proposal submitted by Miami Conservancy District. November 20, 2002

MDEQ. 2000. Rule 57 Water Quality Values. Michigan Department of Environmental Quality. Criterion accessible from here: http://www.michigan.gov/deq/1,1607,7-135-3313_3686_3728-11383-CI,00.html

Nahmani, J. M. E. Hodson, S. Devin, and M. G. Vijver. 2009. Uptake kinetics of metals by the earthworm Eisenia fetida exposed to field-contaminated soils. Environmental Pollution, 157: 2622–2628.

NOAA. 1999. Screening quick reference tables (SQRT). Hazmat Report 99-1. National Oceanic and Atmospheric Administration, Washington, DC.

Norris, S., and Spieker, A. 1966. Ground-Water Resources of the Dayton, Ohio Area, U.S. Geological Survey Water-Supply Paper #1808, 167 pp.

NPS. 1997. Environmental Contaminants Encyclopedia entry on cyanide(s) in general. Roy j. Irwin, National Park Service, Water Resources Divisions.

Ohio EPA. 1996. Biological and Water Quality Study of the Middle to Lower Great Miami River and Selected Tributaries, 1995. Ohio EPA Technical Report MAS/1996-12-8.

Ohio EPA. 1997. Biological and Water Quality Study of the Middle to Lower Great Miami River and Selected Tributaries, 1995. Volume I. OEPA Technical Report MAS/1996-12-8.

Ohio EPA. 2003. Ecological Risk Assessment: Guidance Document. February 2003. http://www.epa.state.oh.us/derr/rules/RR-031.pdf.

Ohio EPA. 2009. State of Ohio water quality standards. Chapter 3745-1 of the Administrative Code.

Ohio EPA. 2009. Ohio Voluntary Action Program Rules, OAC 3745-300-07, Phase II Property Assessment for the Voluntary Action Program, Division of Emergency and Remedial Response, Ohio Environmental Protection Agency, March 1, 2009.

Oliver, B. G. and Niimi, A. J. 1988. Trophodynamic Analysis of Polychlorinated Biphenyl Congeners and Other Chlorinated Hydrocarbons in the Lake Ontario Ecosystem. Environmental Science and Technology, 22:388-397

Ritzi, R. W., D. F. Jayne, A. J. Zahradnik, A. A. Field, and G. E. Fogg. 1994, Geostatistical Modeling of Heterogeneity in Glaciofluvial, Buried Valley Aquifers. Groundwater, 32(4): 666-674.

Ritzi, R. W., D. F. Dominic, N. R. Brown, K. W. Kausch, P. J. McAlenney, and M. J. Basial. 1995, Hydrofacies Distribution and Correlation in the Miami Valley Aquifer System. Water Resources Research, 31(12): 3271-3281.

Ritzi, R. W., D. F. Dominic, and K. W. Kausch. 1996, Aquitard Distribution in a Northern Reach of the Miami Valley Aquifer, Ohio, USA: Part 1. Three Dimensional Geostatistical Evaluation of Physical Heterogeneity. Hydrogeology Journal, 4(2): 12-24.

Rowe, G. L., D. C. Reutter, D. L. Runkle, J. A. Hambrook, S. D. Janosy, and L. H Hwang. 2004. Water Quality in the Great and Little Miami River Basins, Ohio and Indiana, 1999-2001. USGS Circular 1229.

Sample, B. E., D. M. Opresko, and G. W Suter II. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. Oak Ridge National Laboratory ES/ER/TM-86/R3.

Sample, B. E., J. J. Beauchamp, R. A. Emroymson, G. W. Suter, II, and T. L. Ashwood. 1998a. Development and validation of bioaccumulation models for earthworms. ES/ER/TM-219. U.S. Department of Energy, Office of Environmental Management, Washington, DC.

Sample, B. E., J. J. Beauchamp, R. A. Emroymson, and G. W. Suter, II. 1998b. Development and validation of bioaccumulation models for small mammals.

ES/ER/TM-219. U.S. Department of Energy, Office of Environmental Management, Washington, DC.

Shrestha, G., S. J. Traina, and C. W. Swanston,. 2010. Black carbon's properties and role in the environment: a comprehensive review. Sustainability 2: 294-320.

Smith, D. W. and S. M. Jones. 2005. It's time to abandon co-occurrence sediment quality benchmarks (SQBs). Canadian Technical Report of Fisheries and Aquatic Sciences 2617.

Smith, D. W. 2007. It's time to formally abandon co-occurrence sediment quality benchmarks (SQBs): Part 2. Proceedings of the 9th International Symposium on In-Situ and On-Site Bioremediation, Baltimore, MD, May 2007.

Staples, C. A., D. R Peterson, T. F. Parkerton, and W. J. Adams. 1997. The environmental fate of phthalate esters : a literature review. Chemosphere 35: 667-749.

Thomann, R. V. and J. Komlos. 1999. Model of biota-sediment accumulation factor for polycyclic aromatic hydrocarbons. Environmental Toxicology And Chemistry 18: 1060–1068.

Tracey, T. A. and D. J. Hansen. 1995. Use of biota-sediment accumulation factors to assess similarity of nonionic organic chemical exposure to benthically coupled organisms of different trophic mode. Archives of Environmental Contamination and Toxicology 30: 467-475.

USEPA, 1989a. Risk Assessment Guidance for Superfund (RAGS): Volume 1 – Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989.

USEPA, 1989b. Risk Assessment Guidance for Superfund: Volume II - Environmental Evaluation Manual. Interim Final. Office of Emergency and Remedial Response. USEPA/540/1-89/001.

USEPA. 1991a. Risk Assessment Guidance for Superfund (RAGS): Volume 1 - Human Health Evaluation Manual – Supplemental Guidance, Standard Default Exposure Factors, Interim Final, OSWER Directive 9285.6-03.

USEPA. 1991b. Risk Assessment Guidance for Superfund (RAGS): Volume 1 - Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals), EPA/540/R-92/003, Publication 9285.7-01B.

USEPA. 1992. Framework for Conducting Ecological Risk Assessment, USEPA/630/R-92/001.

USEPA. 1993. Wildlife Exposure Factors Handbook, Volume I. USEPA/600/R-93/187a.

USEPA. 1995. Assessing Dermal Exposure From Soil, Region III Technical Guidance Manual, EPA/903-K-95-003.

USEPA. 1995. Great Lakes Water Quality Guidance technical support document for procedure to determining bioaccumulation factors. EPA-820-B-95-005.

USEPA. 1996. EcoUpdate: Ecotox Thresholds. EPA 540/F-95/038, January, 1996. Available at: www.epa.gov/oswer/riskassessment/pdf/ eco_updt.pdf

USEPA. 1997a. Exposure Factors Handbook, Volume I: General Factors; Volume II: Food Ingestion Factors; Volume III: Activity Factors. EPA/600/P-95/002Fa, U.S. EPA, Washington, DC. August 1997.

USEPA. 1997b. Ecological risk assessment guidance for Superfund: process for designing and conduction ecological risk assessments. Interim final. EPA 540-R-97-OCS. U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Edison, NJ.

USEPA. 1999. Screening Level Ecological Risk Assessment Protocol for Hazardous Waste Combustion Facilities, USEPA/530-D-99-001A.

USEPA. 2000a. Region 4 Human Health Risk Assessment Bulletins – Supplement to RAGS, Section 4: Exposure Assessment, May.

USEPA. 2000b. Ecological Soil Screening Level Guidance. Draft. USEPA Office of Emergency and Remedial Response.

USEPA. 2001. Risk Assessment Guidance for Superfund (RAGS): Volume 1 - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments) Final, Publication 9285.7-47, December 2001.

USEPA. 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December 2002.

USEPA. 2003a. Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. EPA-540-R-03-001, January 2003.

USEPA. 2003b. Human Health Toxicity Values in Superfund Risk Assessments. OSWER 9285.7-53, December 5 2003.

USEPA. 2003c. Procedures for the Deriation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. EPA-600-R-02-013.

USEPA. 2004a. USEPA Risk Assessment Guidance for Superfund (RAGS): Volume 1 - Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), EPA/540/R/99/005, July 2004.

USEPA. 2004b. User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings, Office of Emergency and Remedial Response, February.

USEPA. 2004c. An examination of EPA risk assessment principles and practices EPA/100/B-04/001, March.

USEPA. 2006a. Screening Level Benchmarks Used in Ecological Risk Assessments. http://www.epa.gov/R5Super/ecology/html/screeningbench.html

USEPA. 2006b. National recommended water quality criteria. United States Environmental Protection Agency, Office of Water, Washington, DC.

USEPA. 2007a. Streamlined Risk Assessment Operable Unit 1 - Source Area Landfill Contents and On-Site Groundwater. South Dayton Dump and Landfill.

USEPA. 2007b. Ecological Soil Screening Levels for Polycyclic Aromatic Hydrocarbons (PAHs): Interim Final. OSWER Directive 9285.7-78. June 2007

USEPA. 2008a. Child-Specific Exposure Factors Handbook, September 2008.

USEPA. 2008b. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: Compendium of Tier 2 Values for Nonionic Organics. EPA-600-R-02-016. Office of Research and Development. Washington, DC 20460

USEPA. 2009a. USEPA Risk Assessment Guidance for Superfund (RAGS): Volume 1 - Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment), Final, January 2009.

USEPA. 2009b. USEPA Regional Screening Level Table (RSL), December 2009.

EPA Region V. 2000. *Ecological Data Quality Levels*. Available on the Internet at http://www.epa.gov/Region5/rcraca/edql.htm.

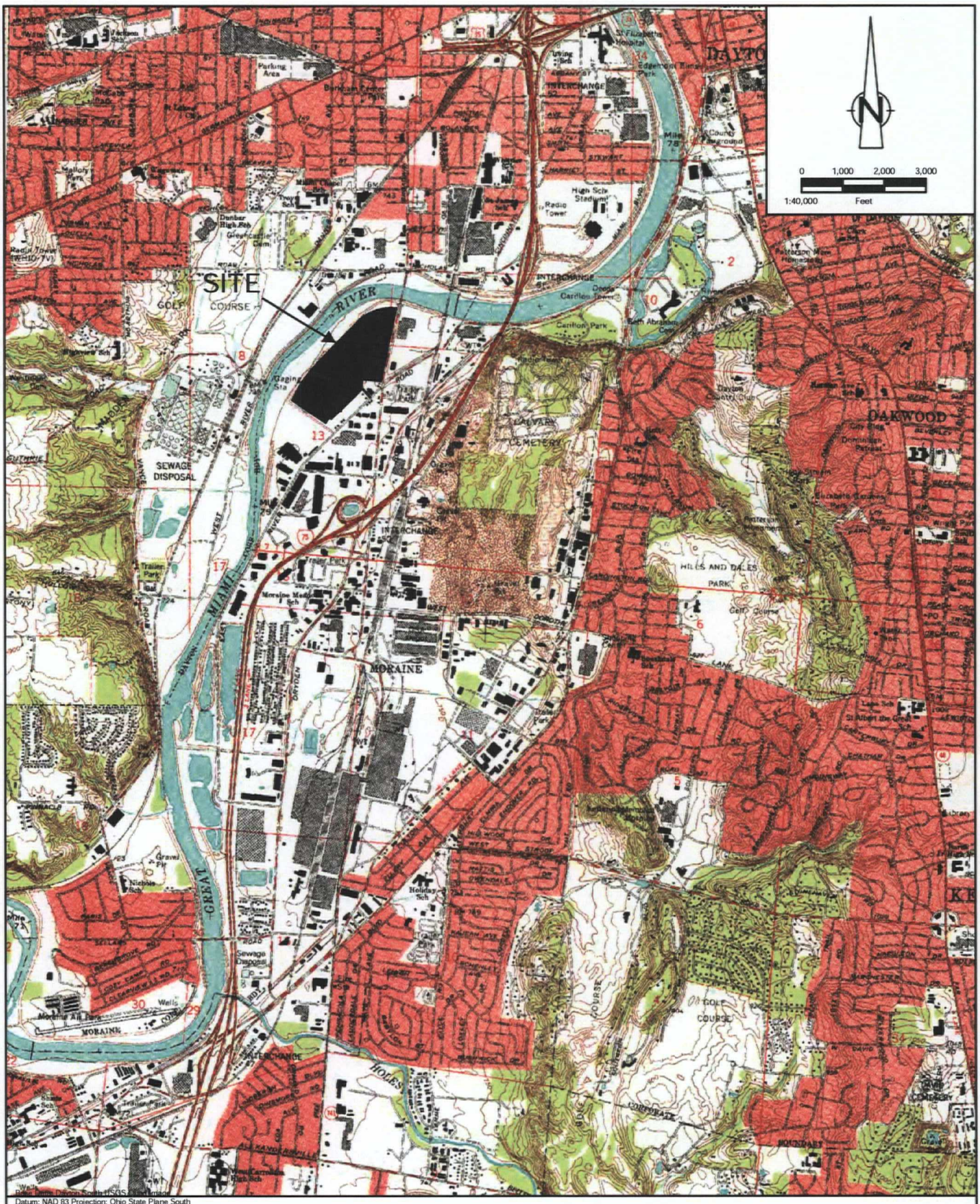
EPA Region V. 2004. *Screening Level Benchmarks Used in Ecological Risk Assessments*. See www.epa.gov/region5/superfund/ecology/html/ screeningbench.html.

United States Geological Survey, 1981. Dayton, Ohio, 7.5-minute Quadrangle.

Van den Berg, M., L. Birnbaum, A. T. Bosveld, B. Brunström, P. Cook, M. Feeley, J. P. Giesy, A. Hanberg, R. Hasegawa, S. W. Kennedy, T. Kubiak, J. C. Larsen, F. X. van Leeuwen, A. K. Liem, C. Nolt, R. E. Peterson, L. Poellinger, S. Safe, D. Schrenk, D. Tillitt, M. Tysklind, M. Younes, F. Waern, and T. Zacharewski, 1998. Toxic equivalency factors (TEFs) for PCBs, PCDDs, PCDFs for humans and wildlife. Environmental Health Perspectives, 106(12): 775–792.

Yost. 1995. Data on Ground-Water Levels and Ground-Water/Surface-Water Relations in the Great Miami River and Little Miami River Valleys, Southwestern Ohio. 1995 U.S. Geological Survey Open-File Report 95-357.

FIGURES

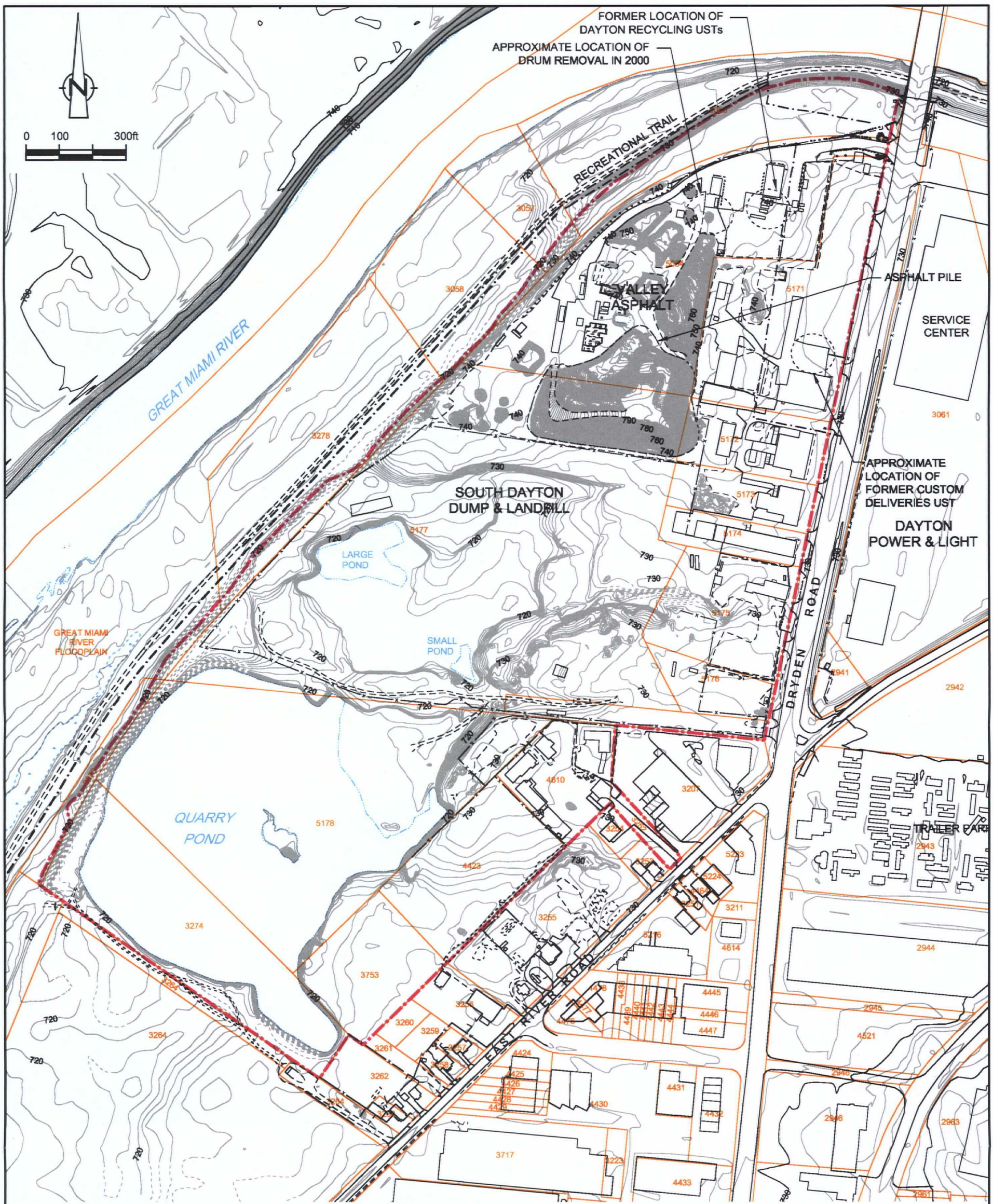


Datum: NAD 83 Projection: Ohio State Plane South

figure 1.1

SITE LOCATION MAP
BASELINE RISK ASSESSMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-87(REP011)GIS-WA001 January 26, 2010



LEGEND

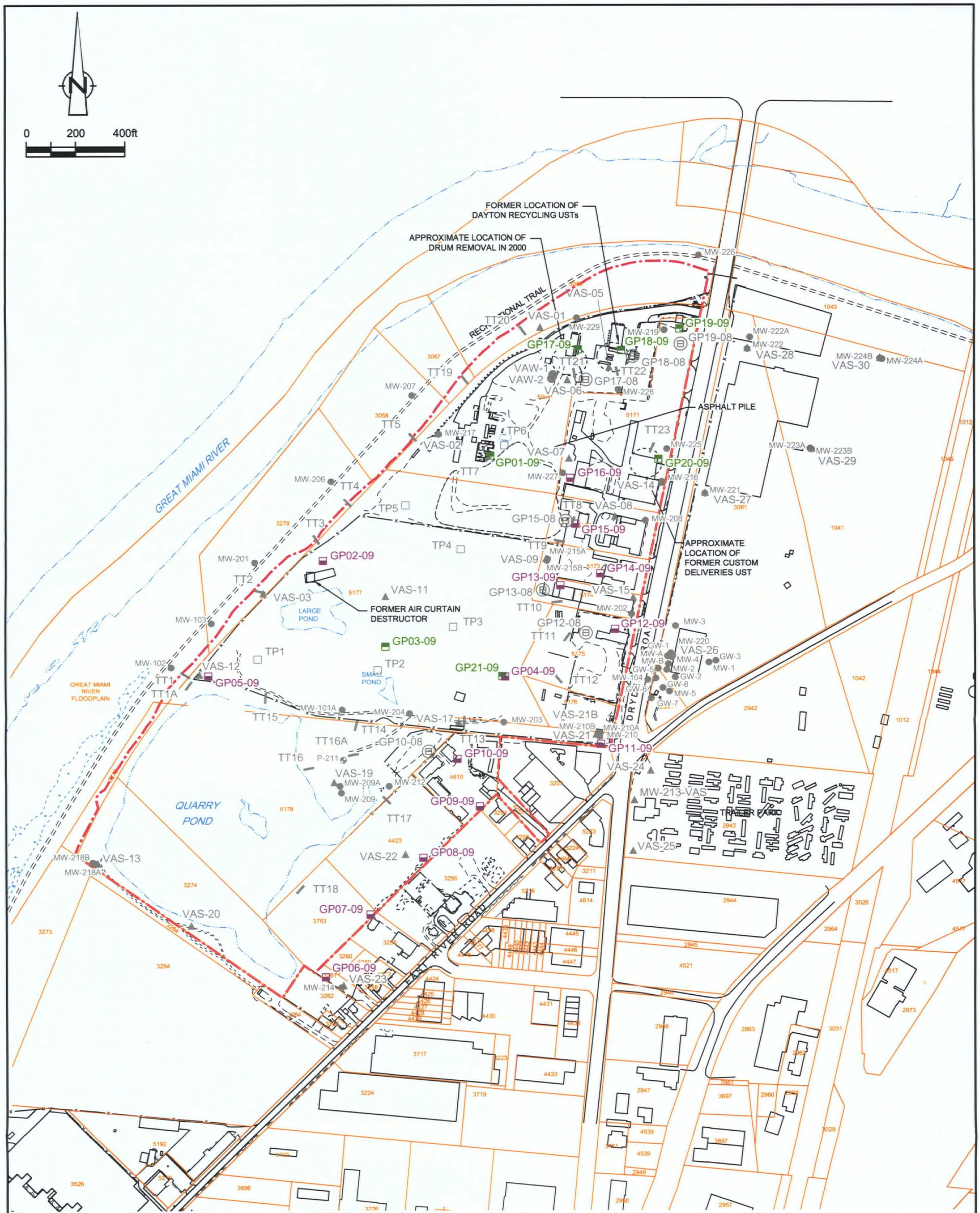
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- 730 EXISTING GROUND CONTOUR

figure 1.2

SITE PLAN
BASELINE RISK ASSESSMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

38443-87(011)GN-WA001 APR 27/2010



LEGEND

APPROXIMATE SITE BOUNDARY	TT1 — TEST TRENCH LOCATION
EDGE OF WATER	TP6 — TEST PIT LOCATION
PARCEL BOUNDARY	VAS-01 — VAS SAMPLING LOCATION
MW-206 — MONITORING WELL LOCATION	GP10-08 — PROPOSED LANDFILL GAS PROBE LOCATION (ORIGINAL)
P-211 — PIEZOMETER LOCATION	GP01-09 — ACTUAL SHALLOW LANDFILL GAS PROBE LOCATION
	GP02-09 — ACTUAL DEEP LANDFILL GAS PROBE LOCATION

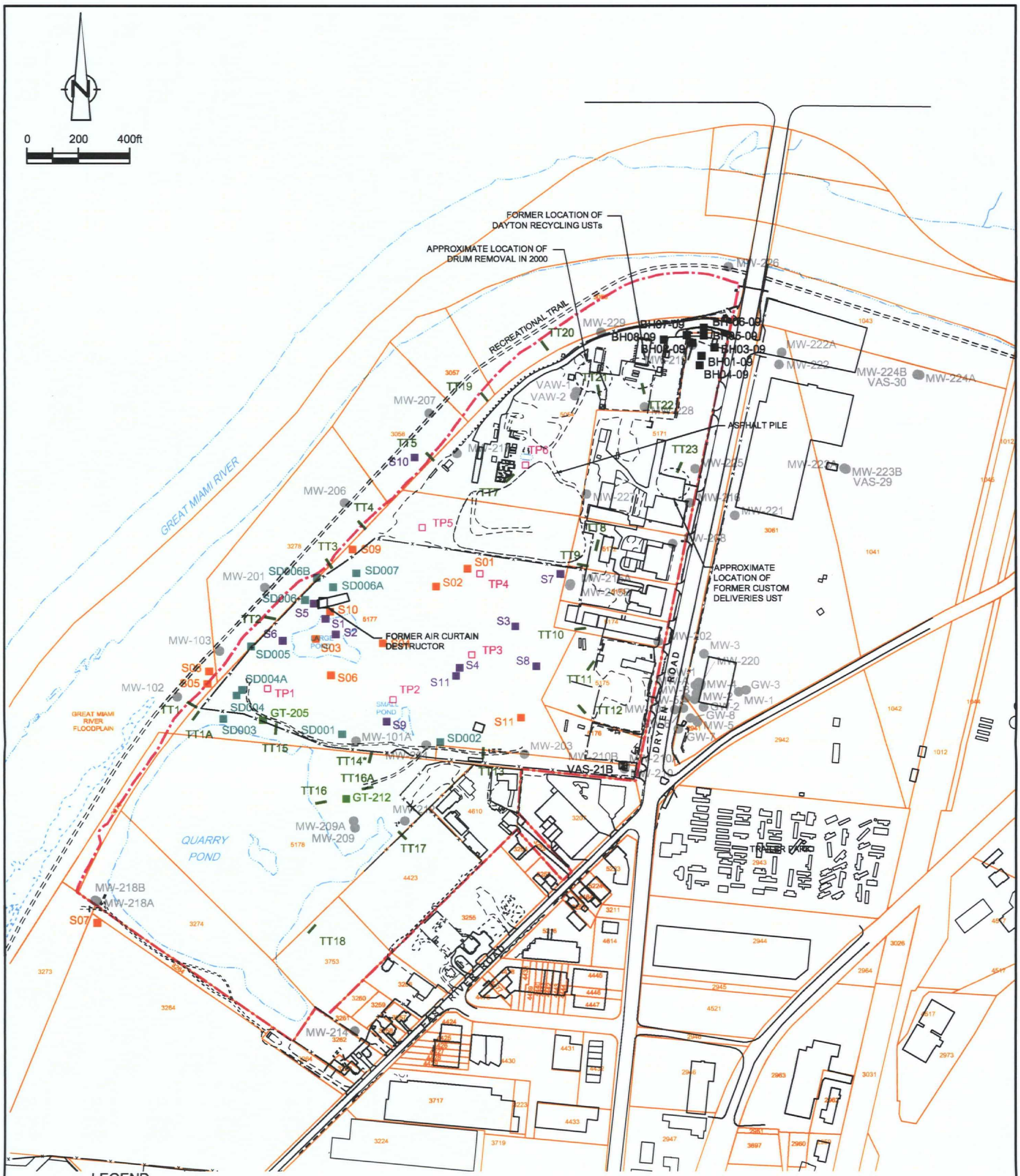
figure 2.1

INVESTIGATIVE LOCATIONS - SOIL GAS
BASELINE RISK ASSESSMENT
SOUTH DAYTON DUMP AND LANDFILL SITE

Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

38443-87(011)GN-WA002 APR 26/2010

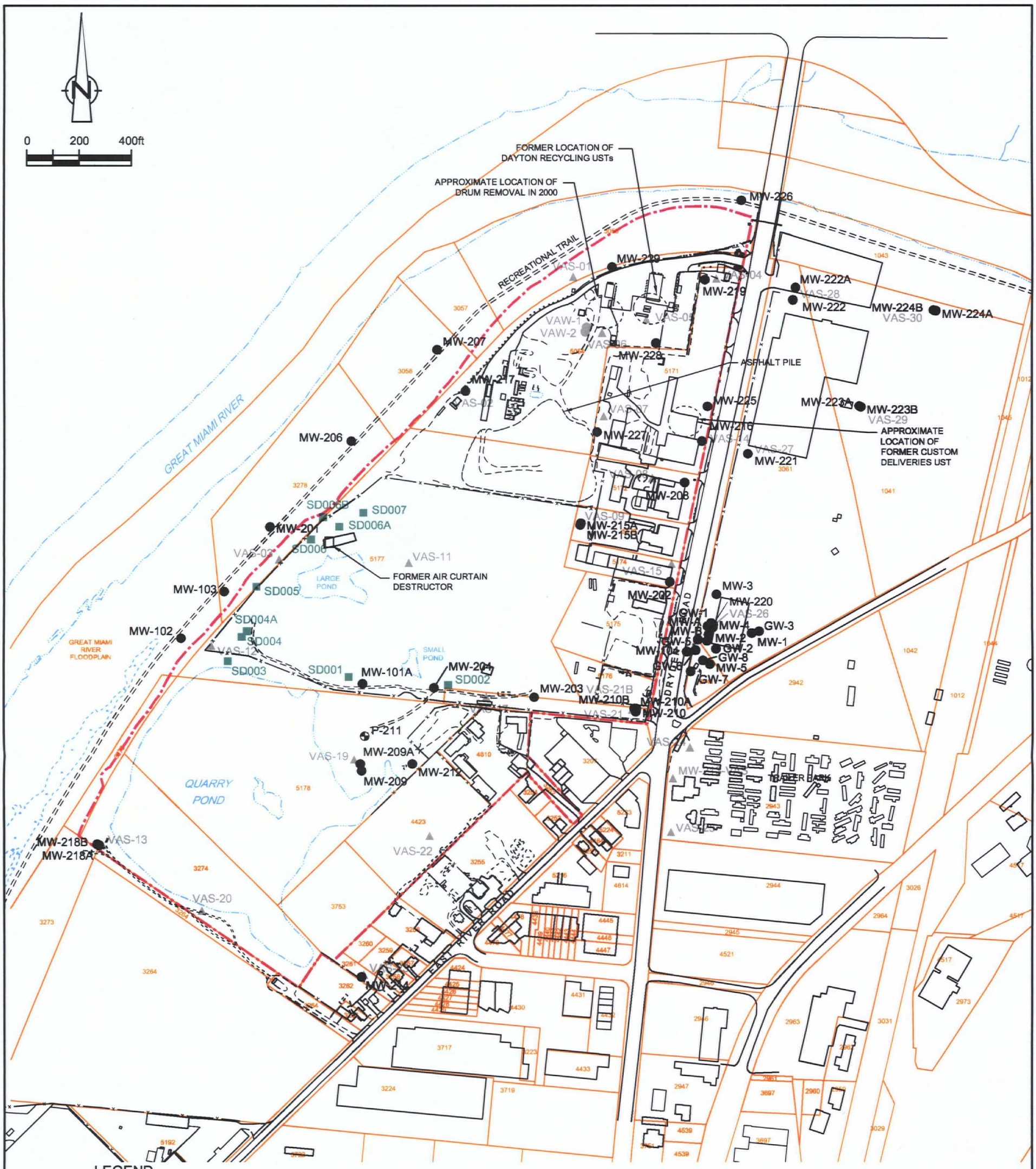


SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

figure 2.2

INVESTIGATIVE LOCATIONS - SOILS
BASELINE RISK ASSESSMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

38443-87(011)GN-WA003 APR 26/2010



LEGEND

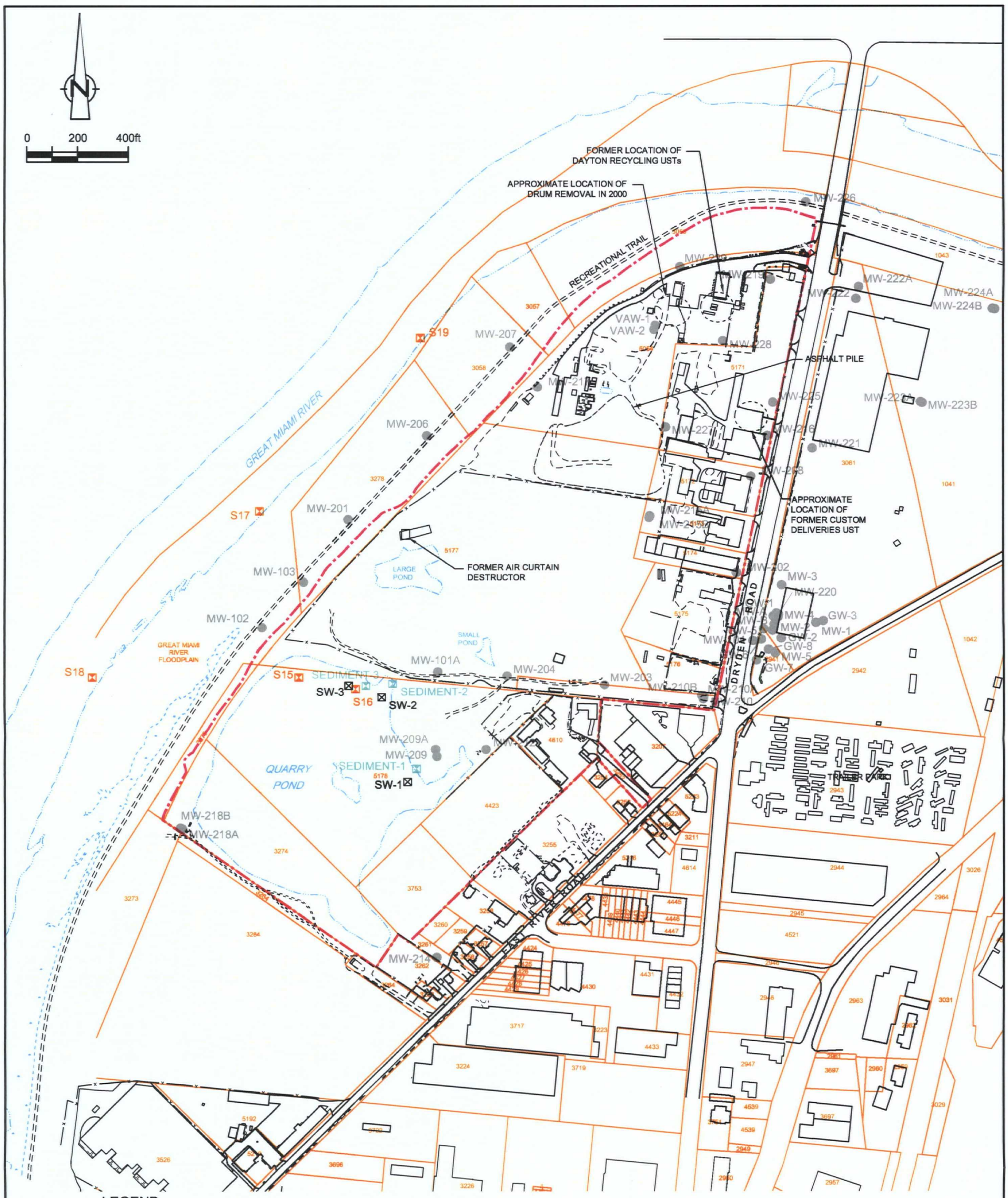
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- MW-206 MONITORING WELL LOCATION
- P-211 PIEZOMETER LOCATION
- VAS01 VAS SAMPLING LOCATION
- SD003 PSARA SOIL BORING LOCATION (APPROXIMATE)

figure 2.3

INVESTIGATIVE LOCATIONS - GROUNDWATER
BASELINE RISK ASSESSMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

38443-87(011)GN-WA004 APR 26/2010



LEGEND

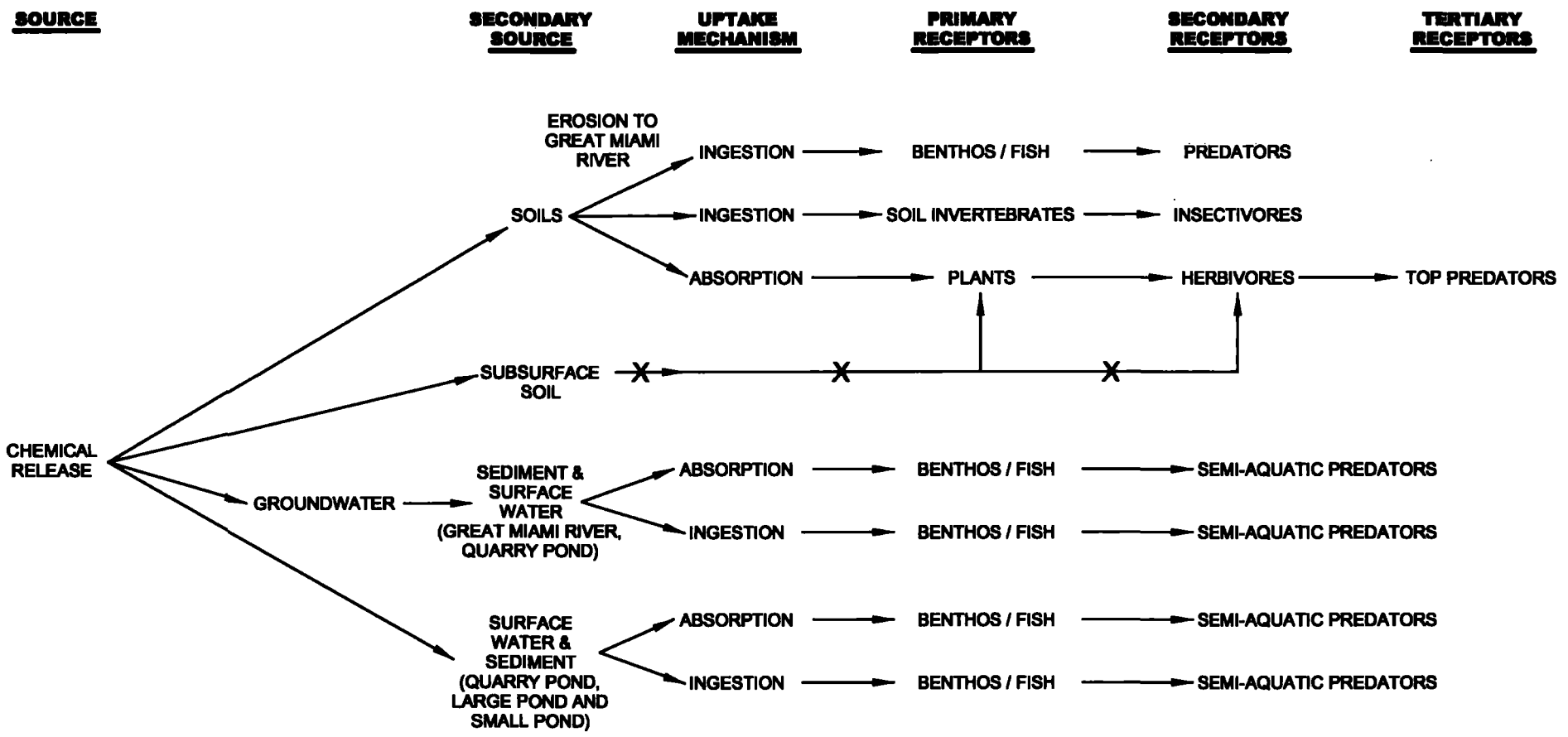
- APPROXIMATE SITE BOUNDARY
- EDGE OF WATER
- PARCEL BOUNDARY
- MW-206 MONITORING WELL LOCATION
- S15 OHIO EPA SEDIMENT SAMPLE LOCATION (APPROXIMATE)
- SEDIMENT-1 FI 1999 & 2000 SEDIMENT SAMPLING LOCATION (APPROXIMATE)
- SW-1 FI 1999 & 2000 SURFACE WATER SAMPLE LOCATION (APPROXIMATE)

figure 2.4

INVESTIGATIVE LOCATIONS - SURFACE WATER AND SEDIMENT
BASELINE RISK ASSESSMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
Moraine, Ohio

SOURCES:
THE PAYNE FIRM, INC., PROJECT 0279.44.05, FIGURE 1, DATED 9/12/05;
TETRA TECH EM INC., PROJECT L0312006-SOUTH DAYTON DUMP, FIGURE 2, SITE LAYOUT, 05/25/2004;
CITY OF MORAINE.
ABRAMS AERIAL SURVEY INC. PROJECT 38443, AASI 29610, 04/02/2008

38443-87(011)GN-WA005 APR 26/2010



LEGEND

X → INCOMPLETE OR FUNCTIONALLY INCOMPLETE PATHWAY

figure 4.1

PRELIMINARY ECOLOGICAL CONCEPTUAL SITE MODEL
BASELINE RISK ASSESSMENT
SOUTH DAYTON DUMP & LANDFILL SITE
Moraine, Ohio

CRA

38443-87(011)GN-WA006 MAR 09/2010

TABLES

TABLE 4.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN (COPEC) IN SURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface Soil (0-2 ft bgs)
Exposure Medium: Surface Soil

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Ecological Screening Level (4)		SQ (5)	COPEC Flag	Rationale for Contaminant Deletion or Selection (6)
	VOCs														
540-59-0	1,2-Dichloroethene (total)	200		200		µg/kg	S8 (EPA); 0-1 ft bgs (10/23/90)	1/20	5 - 16	200	784	Region V	0.3		SQ<1.5
78-93-3	2-Butanone (MEK)	1	J	4.7	J	µg/kg	TT-16; 2 ft bgs (09/30/08)	3/22	10 - 19	4.7	89,600	Region V	0.0		SQ<1.5
108-10-1	4-Methyl-2-Pentanone (MIBK)	36	J	36	J	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	1/22	10 - 19	36	443,000	Region V	0.0		SQ<1.5
67-64-1	Acetone	3	J	25	J	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	3/22	5 - 19	25	2,500	Region V	0.0		SQ<1.5
75-09-2	Methylene chloride	16		16		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	1/11	4.7 - 17	16	4,050	Region V	0.0		SQ<1.5
127-18-4	Tetrachloroethene	11		11		µg/kg	S8 (EPA); 0-1 ft bgs (10/23/90)	1/22	4.7 - 16	11	9,920	Region V	0.0		SQ<1.5
108-88-3	Toluene	2	J	10	J	µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	9/22	4.7 - 16	10	5,450	Region V	0.0		SQ<1.5
79-01-6	Trichloroethene	4	J	4	J	µg/kg	S8 (EPA); 0-1 ft bgs (10/23/90)	1/22	4.7 - 16	4	12,400	Region V	0.0		SQ<1.5
1330-20-7	Xylenes (total)	3	J	3	J	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	1/22	5 - 16	3	10,000	Region V	0.0		SQ<1.5
	SVOCs														
91-57-6	2-Methylnaphthalene	46	J	1800		µg/kg	S1 (EPA); 1-2 ft bgs (10/23/90)	13/22	7.3 - 530	1800	29,000	Region V	0.1		SQ<1.5
83-32-9	Acenaphthene	26	J	1200		µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	8/22	7.3 - 530	1200	29,000	Region V	0.0		SQ<1.5
208-96-8	Acenaphthylene	50	J	87		µg/kg	TT-16; 2 ft bgs (09/30/08)	2/11	7.3 - 530	87	29,000	Region V	0.0		SQ<1.5
120-12-7	Anthracene	26	J	3000		µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	10/22	7.3 - 530	3000	29,000	Eco-SSL	0.1		SQ<1.5
56-55-3	Benzo(a)anthracene	33		8500		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	16/22	330 - 530	8500	1,100	Eco-SSL	7.7	X	SQ>1.5
50-32-8	Benzo(a)pyrene	35		5700		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	15/22	330 - 530	5700	1,100	Eco-SSL	5.2	X	SQ>1.5
205-99-2	Benzo(b)fluoranthene	46		9500		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	16/22	330 - 530	9500	1,100	Eco-SSL	8.6	X	SQ>1.5
191-24-2	Benzo(g,h,i)perylene	22		4700		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	12/22	330 - 530	4700	1,100	Eco-SSL	4.3	X	SQ>1.5
207-08-9	Benzo(k)fluoranthene	21		6400		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	11/22	330 - 530	6400	1,100	Eco-SSL	5.8	X	SQ>1.5
117-81-7	bis(2-Ethylhexyl)phthalate	32	J	2100		µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	8/22	55 - 530	2100	925	Region V	2.3	X	SQ>1.5
85-68-7	Butyl benzylphthalate	25	J	18000	E	µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	7/22	55 - 530	18000	239	Region V	75.3	X	SQ>1.5
86-74-8	Carbazole	38	J	380	J	µg/kg	S07 (OEPA); 0-0.2 ft bgs (07/09/96)	4/11	55 - 530	380	--	--	--		No, See Text
218-01-9	Chrysene	21	J	6400	J	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	17/22	330 - 530	6400	1,100	Eco-SSL	5.8	X	SQ>1.5
53-70-3	Dibenz(a,h)anthracene	110	J	1600		µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	7/22	7.3 - 530	1600	1,100	Eco-SSL	1.45		SQ<1.5
132-64-9	Dibenzofuran	28	J	830	J	µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	8/22	55 - 530	830	--	--	--		No, See Text
84-74-2	Di-n-butylphthalate	18	J	1500		µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	8/22	55 - 410	1500	150	Region V	10.0	X	SQ>1.5
117-84-0	Di-n-octylphthalate	19	J	23	J	µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	2/11	55 - 530	23	709,000	Region V	0.0		SQ<1.5
206-44-0	Fluoranthene	21	J	21000	D	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	19/22	330 - 530	21000	29,000	Eco-SSL	0.7		SQ<1.5
86-73-7	Fluorene	38	J	1500		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	7/22	7.3 - 530	1500	29,000	Eco-SSL	0.1		SQ<1.5
193-39-5	Indeno(1,2,3-cd) pyrene	20		5000		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	14/22	330 - 530	5000	1,100	Eco-SSL	4.5	X	SQ>1.5
91-20-3	Naphthalene	20	J	1100		µg/kg	S1 (EPA); 1-2 ft bgs (10/23/90)	13/22	7.3 - 530	1100	29,000	Eco-SSL	0.0		SQ<1.5
86-30-6	N-Nitrosodiphenylamine	27	J	450	J	µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	2/22	55 - 530	450	545	Region V	0.8		SQ<1.5
85-01-8	Phenanthrene	26		16000	D	µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	19/22	330 - 530	16000	29,000	Eco-SSL	0.6		SQ<1.5
108-95-2	Phenol	64	J	64	J	µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	1/11	55 - 530	64	120,000	Region V	0.0		SQ<1.5
129-00-0	Pyrene	20	J	13000		µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	19/22	330 - 1300	13000	1,100	Eco-SSL	11.8	X	SQ>1.5

TABLE 4.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN (COPEC) IN SURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface Soil (0-2 ft bgs)
Exposure Medium: Surface Soil

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Ecological Screening Level (4)		SQ (5)	COPEC Flag	Rationale for (6) Contaminant Deletion or Selection
	Metals														
7429-90-5	Aluminum	1140000		14300000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	22/22	–	14,300,000	Narrative	Eco-SSL			SQ<1.5
7440-36-0	Antimony	700	J	278000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	10/22	680 - 7200	278,000	270	Eco-SSL	1029.6	X	SQ>1.5
7440-38-2	Arsenic	1600	J	141000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	22/22	1200	141,000	18,000	Eco-SSL	7.8	X	SQ>1.5
7440-39-3	Barium	7200	J	13000000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	22/22	–	13,000,000	330,000	Eco-SSL	39.4	X	SQ>1.5
7440-41-7	Beryllium	240	B	5800		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	20/22	250 - 1000	5,800	21,000	Eco-SSL	0.3		SQ<1.5
7440-43-9	Cadmium	290	B	16300		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	16/22	300 - 1000	16,300	360	Eco-SSL	45.3	X	SQ>1.5
7440-70-2	Calcium	979000	B	98000000		µg/kg	S11 (OEPA); 0.2-0.3 ft bgs (07/09/96)	22/22	–	98,000,000	Nutrient				NUT
7440-47-3	Chromium	6300		91700		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	22/22	–	91,700	26,000	Eco-SSL	3.5	X	SQ>1.5
7440-48-4	Cobalt	1400	J	22100		µg/kg	S9 (EPA); 0-1 ft bgs (10/23/90)	21/22	10000	22,100	13,000	Eco-SSL	1.7	X	SQ>1.5
7440-50-8	Copper	12600		191000000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	191,000,000	28,000	Eco-SSL	6821.4	X	SQ>1.5
57-12-5	Cyanide	190	J	3700		µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	9/13	190 - 600	3,700	1,330	Region V	2.8	X	SQ>1.5
7439-89-6	Iron	2840000		92300000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	92,300,000	Narrative	Eco-SSL			SQ<1.5
7439-92-1	Lead	7200		12100000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	12,100,000	11,000	Eco-SSL	1100.0	X	SQ>1.5
7439-95-4	Magnesium	294000	J	44300000		µg/kg	TT-16; 2 ft bgs (09/30/08)	22/22	–	44,300,000	Nutrient	–	–		NUT
7439-96-5	Manganese	7200		693000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	693,000	220,000	Eco-SSL	3.2	X	SQ>1.5
7439-97-6	Mercury	35	B	480		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	7/22	8 - 170	480	2,200	Dutch MPC	0.2		SQ<1.5
7440-02-0	Nickel	10700		402000		µg/kg	S8 (EPA); 0-1 ft bgs (10/23/90)	22/22	–	402,000	38,000	Eco-SSL	10.6	X	SQ>1.5
7440-09-7	Potassium	86000	J	1630000	J	µg/kg	S9 (EPA); 0-1 ft bgs (10/23/90)	22/22	–	1,630,000	Nutrient	–	–		NUT
7782-49-2	Selenium	910	J	8800		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	18/22	900 - 30000	8,800	520	Eco-SSL	16.9	X	SQ>1.5
7440-22-4	Silver	230	J	7600		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	5/22	210 - 2000	7,600	4,200	Eco-SSL	1.8	X	SQ>1.5
7440-23-5	Sodium	43700	J	809000	J	µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	21/22	550000	809,000	Nutrient	–	–		NUT
18496-25-8	Sulfide	18600	J	26800	J	µg/kg	Roll-off Box (Boart Longyear VAS soil) (01/14/09)	2/2	–	26,800	4	Region V	7486.0	X	SQ>1.5
7440-28-0	Thallium	170		4500		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	11/22	140 - 2000	4,500	1,300	Dutch MPC	3.5	X	SQ>1.5
7440-62-2	Vanadium	620	J	92600		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	22/22	–	92,600	7,800	Eco-SSL	11.9	X	SQ>1.5
7440-66-6	Zinc	9200		11500000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	11,500,000	46,000	Eco-SSL	250.0	X	SQ>1.5
	PCBs														
1336-36-3	Total PCBs	20	J	7000		µg/kg	S2 (EPA); 0-1 ft bgs (10/23/90)	11/24	38 - 160	7000	0.33	Region V	21212.1	X	SQ>1.5
	Pesticides														
72-54-8	4,4'-DDD	0.65	J	4.4		µg/kg	S11 (OEPA); 0.2-0.3 ft bgs (07/09/96)	2/11	3.4 - 100	4.4	21	Eco-SSL	0.2		SQ<1.5
72-55-9	4,4'-DDE	2.4	PJ	2.6	J	µg/kg	S04 (OEPA); 1.5-2 ft bgs (07/09/96)	2/11	3.4 - 100	2.6	21	Eco-SSL	0.1		SQ<1.5
50-29-3	4,4'-DDT	1.6	PJ	8.8	P	µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	2/11	3.4 - 100	8.8	21	Eco-SSL	0.4		SQ<1.5
319-84-6	alpha-BHC	0.71	PJ	0.71	PJ	µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	1/11	1.8 - 100	0.71	99	Region V	0.0		SQ<1.5
5103-71-9	alpha-Chlordane	5.4	PJ	5.4	P	µg/kg	S04 (OEPA); 1.5-2 ft bgs (07/09/96)	1/11	1.8 - 100	5.4	224	Region V	0.0		SQ<1.5
959-98-8	Endosulfan I	0.42	PJ	0.42	PJ	µg/kg	S07 (OEPA); 0-0.2 ft bgs (07/09/96)	1/11	1.8 - 100	0.42	119	Region V	0.0		SQ<1.5
33213-65-9	Endosulfan II	1.4	J	5.4		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	2/11	3.4 - 100	5.4	119	Region V	0.0		SQ<1.5
72-20-8	Endrin	2.3	PJ	2.3	PJ	µg/kg	S03 (OEPA); 1.5-2 ft bgs (07/09/96)	1/11	3.4 - 100	2.3	10	Region V	0.2		SQ<1.5
7421-93-4	Endrin aldehyde	6.4	P	6.6		µg/kg	S03 (OEPA); 1.5-2 ft bgs (07/09/96)	2/11	3.4 - 100	6.6	11	Region V	0.6		SQ<1.5
53494-70-5	Endrin ketone	7.5	P	7.5	P	µg/kg	S11 (OEPA); 0.2-0.3 ft bgs (07/09/96)	1/11	3.4 - 100	7.5	10	Region V	0.7		SQ<1.5
58-89-9	gamma-BHC (Lindane)	0.42	J	1.8	J	µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	3/11	1.8 - 100	1.8	5	Region V	0.4		SQ<1.5
5103-74-2	gamma-Chlordane	0.35	PJ	4.3		µg/kg	S04 (OEPA); 1.5-2 ft bgs (07/09/96)	4/11	1.8 - 100	4.3	224	Region V	0.0		SQ<1.5
1024-57-3	Heptachlor epoxide	0.49	PJ	0.78	PJ	µg/kg	S04 (OEPA); 1.5-2 ft bgs (07/09/96)	2/11	1.8 - 100	0.78	152	Region V	0.0		SQ<1.5
72-43-5	Methoxychlor	1.8	PJ	1.8	PJ	µg/kg	S03 (OEPA); 1.5-2 ft bgs (07/09/96)	1/11	18 - 200	1.8	20	Region V	0.1		SQ<1.5

TABLE 4.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN (COPEC) IN SURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface Soil (0-2 ft bgs)
Exposure Medium: Surface Soil

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Ecological Screening Level (4)		SQ (5)	COPEC Flag	Rationale for Contaminant Deletion or Selection (6)
	Dioxins/Furans														
–	Total TEQ	0.8		12		ng/kg	NE Former Air Curtain Destructor from AshPile (07/11/08)	2/2	–	12	–	–	–		See Text
	2,3,7,8-TCDD	ND		0.97	J	ng/kg	NE Former Air Curtain Destructor from AshPile (07/11/08)	1/2	0.19	0.97	0.12	Revion V	8.1		See Text

Notes:

(1) Minimum/maximum detected concentration.

(2) Based on data collected from sampling locations: Centre Room of Trailer, Construction Debris Area, Desk Surface in Trailer, Exterior West Side of Trailer, Frame of Office Trailer, NE Former Air Curtain Destructor from AshPile, NW of MW101A (from AshPile), Paper Towel Dispenser Surface of Trailer, Roll-off Box (Boart Longyear VAS Soil), Right Side Tire of Mobile Office Trailer, Trailer Desk Surface, S1 (EPA), S2 (EPA), S3 (EPA), S4 (EPA), S5 (EPA), S6 (EPA), S7 (EPA), S8 (EPA), S9 (EPA), S10 (EPA), S11 (EPA), S02 (OEAP), S03 (OEPA), S04 (OEPA), S06 (OEPA), S07 (OEPA), S08 (OEPA), S09 (OEPA), S10 (OEPA), S11 (OEPA), TP-2, TT-16, TT-20.

(3) Maximum concentration is used for screening.

(4) Toxicity Screening Level Sources:

Region V: USEPA Region V, 2003. Ecological Data Quality Levels, August 22, 2003.

Eco-SSL: Ecological Soil Screening Level Guidance, USEPA Office of Emergency and Remedial Response, March, 2005.

Dutch MCP: Crommentuijn, T., M.D. Polder, and E.J. van de Plassche, 1997. Maximum permissible concentrations and negligible concentrations for metals, taking into account background. Report #601501.001, National Institute of Public Health and the Environment, Bilthoven, The Netherlands.

(5) SQ (Screening Value) = Maximum detected / Screening Level

(6) Rationale Codes
Selection Reason : Maximum detected greater than SQ (SQ>1.5)
Deletion Reason : Maximum detected less than SQ (SQ<1.5)
Essential Nutrient (NUT)

Definitions:

– = Not Available
N/A = Not Applicable
J = Estimated.
D = Compounds at secondary dilution factor.
E = Exceed calibration range of GC/MS instrument
B = Method blank contamination.
P = Difference for detected Aroclor > 25% between 2 GC column.
µg/kg = micrograms per liter
ft bgs = feet below ground surface
ng/kg = nanograms per kilogram

VOCs - Volatile Organic Compounds
PCBs - Polychlorinated Biphenyls

TABLE 4.2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN IN SEDIMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Ecological Screening Level (4)		SQ (5)	COPEC Flag	Rationale for (6) Contaminant Deletion or Selection
	VOCs														
78-93-3	2-Butanone (MEK)	10	J	10	J	µg/kg	S16 (OEPA) (07/09/96)	1/8	20 - 26	10	42.4	Region V	0.2		SQ<1.5
67-64-1	Acetone	37		47		µg/kg	S15 (OEPA) (07/09/96)	3/8	20	47	9.9	Region V	4.7		No, see text
108-88-3	Toluene	14		14		µg/kg	SED-3 (05/12/00)	1/8	5 - 29	14	1220	Region V	0.0		SQ<1.5
79-01-6	Trichloroethene	0.8	J	0.8	J	µg/kg	S15 (OEPA) (07/09/96)	1/8	5 - 29	0.8	112	Region V	0.0		SQ<1.5
	SVOCs														
91-57-6	2-Methylnaphthalene	75	J	120	J	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	120	4460.0	EPA 2003	0.0	X	See text
83-32-9	Acenaphthene	59	J	92	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	92	4910.0	EPA 2003	0.0	X	See text
208-96-8	Acenaphthylene	61	J	61	J	µg/kg	S16 (OEPA) (07/09/96)	1/2	850	61	4520.0	EPA 2003	0.0	X	See text
120-12-7	Anthracene	110	J	230	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	230	5940.0	EPA 2003	0.0	X	See text
56-55-3	Benzo(a)anthracene	490	J	1500		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	1500	8410	EPA 2003	0.2	X	See text
50-32-8	Benzo(a)pyrene	460	J	1800		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	1800	8410	EPA 2003	0.2	X	See text
205-99-2	Benzo(b)fluoranthene	800	J	2500		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	2500	9790	EPA 2003	0.3		See text
191-24-2	Benzo(g,h,i)perylene	490	J	2000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	2000	10950	EPA 2003	0.2	X	See text
207-08-9	Benzo(k)fluoranthene	300	J	950		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	950	9810	EPA 2003	0.1	X	See text
117-81-7	bis(2-Ethylhexyl)phthalate	470	J	470	J	µg/kg	S16 (OEPA) (07/09/96)	1/2	850	470	182	Region V	2.6	X	SQ>1.5
86-74-8	Carbazole	85	J	110	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	110		Region V			See text
218-01-9	Chrysene	550	J	1500		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	1500	8440	EPA 2003	0.2	X	See text
53-70-3	Dibenz(a,h)anthracene	120	J	480	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	480	12210	EPA 2003	0.0	X	See text
132-64-9	Dibenzofuran	70	J	95	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	95	449	Region V	0.2		SQ<1.5
84-66-2	Diethylphthalate	39	J	39	J	µg/kg	S16 (OEPA) (07/09/96)	1/2	850	39	295	Region V	0.1		SQ<1.5
206-44-0	Fluoranthene	1100		2600		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	2600	7070	EPA 2003	0.4	X	See text
86-73-7	Fluorene	76	J	160	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	160	5380	EPA 2003	0.0	X	See text
193-39-5	Indeno(1,2,3-cd) pyrene	460	J	1900		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	1900	11150	EPA 2003	0.2	X	See text
91-20-3	Naphthalene	70	J	77	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	77	3850	EPA 2003	0.0	X	See text
85-01-8	Phenanthrene	890		1500		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	1500	5960	EPA 2003	0.3	X	See text
129-00-0	Pyrene	1300		3000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	3000	6970	EPA 2003	0.4	X	See text
	Total PAH ESB												2.7	X	
	Total PAH ESB * 2.3												6.3	X	
	Metals														
7429-90-5	Aluminum	2750000		6590000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	6590000		N			SQ<1.5
7440-38-2	Arsenic	10300		12600		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	12600	9790	Region V	1.3		SQ<1.5
7440-39-3	Barium	73000		137000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	137000	300000	Dutch	0.5		SQ<1.5
7440-41-7	Beryllium	280	J	350	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	350	1200	Dutch			SQ<1.5
7440-70-2	Calcium	11800000		53600000		µg/kg	S15 (OEPA) (07/09/96)	2/2	--	53600000					NUT
7440-47-3	Chromium	17200		23100		µg/kg	S15 (OEPA) (07/09/96)	2/2	--	23100	43400.00	Region V	0.5		SQ<1.5
7440-48-4	Cobalt	3700	J	6700	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	6700	50000	Region V	0.1		SQ<1.5
7440-50-8	Copper	24700		29300		µg/kg	S15 (OEPA) (07/09/96)	2/2	--	29300	31600	Region V	0.9		SQ<1.5
57-12-5	Cyanide	270	J	270	J	µg/kg	S15 (OEPA) (07/09/96)	1/2	170	270	0.1	Region V	2700.0		No, see text
7439-89-6	Iron	11300000		13500000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	13500000					NSC

TABLE 4.2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN IN SEDIMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum Concentration (1,2)	Minimum Qualifier	Maximum Concentration (1,2)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Ecological Screening Level (4)		SQ (5)	COPEC Flag	Rationale for Contaminant Deletion or Selection (6)
	Metals (cont'd)														
7439-92-1	Lead	33700		42000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	42000	35800	Region V	1.2		SQ<1.5
7439-95-4	Magnesium	13600000		21600000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	21600000		--			NUT
7439-96-5	Manganese	205000		545000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	545000	630000	SQRT	0.9		SQ<1.5
7440-02-0	Nickel	13400		18700	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	18700	22700	Region V	0.8		SQ<1.5
7440-09-7	Potassium	297000	J	736000	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	736000		--			NUT
7782-49-2	Selenium	590	J	1100	J	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	1100	2900	Dutch	0.4		SQ<1.5
7740-23-5	Sodium	165000	J	206000	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	206000		--			NUT
7440-28-0	Thallium	680	J	680	J	µg/kg	S15 (OEPA) (07/09/96)	1/2	980	680	2600	Dutch			SQ<1.5
7440-62-2	Vanadium	9600	J	16800	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	16800	56000	Dutch	0.3		SQ<1.5
7440-66-6	Zinc	80700		143000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	143000	121000	Region V	1.2		SQ<1.5
	PCBs														
11097-69-1	Aroclor-1254 (PCB-1254)	660		660		µg/kg	S15 (OEPA) (07/09/96)	1/2	94	660	59.8		11.0	X	SQ>1.5
	Pesticides														
72-54-8	4,4'-DDD	1.7	JP	1.7	JP	µg/kg	S15 (OEPA) (07/09/96)	1/2	9.4	1.7	4.88	Region V	0.3		SQ<1.5
72-55-9	4,4'-DDE	2.2	JP	2.2	JP	µg/kg	S16 (OEPA) (07/09/96)	1/2	8.7	2.2	3.16	Region V	0.7		SQ<1.5
50-29-3	4,4'-DDT	2.4	JP	4.4	JP	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	4.4	4.16	Region V	1.1		SQ<1.5
5103-71-9	alpha-Chlordane	1.8	JP	12		µg/kg	S15 (OEPA) (07/09/96)	2/2	--	12	3.24	Region V	3.7	X	SQ>1.5
60-57-1	Dieldrin	2.6	JP	9.6	P	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	9.6	1.9	Region V	5.1	X	SQ>1.5
1031-07-8	Endosulfan sulfate	3.7	JP	3.7	JP	µg/kg	S15 (OEPA) (07/09/96)	1/2	9.4	3.7	34.5	Region V	0.1		SQ<1.5
72-20-8	Endrin	34		34		µg/kg	S15 (OEPA) (07/09/96)	1/2	9.4	34	2.22	Region V	15.3	X	SQ>1.5
7421-93-4	Endrin aldehyde	7.9	JP	7.9	JP	µg/kg	S15 (OEPA) (07/09/96)	1/2	9.4	7.9	480	Region V	0.0	X	See text
53494-70-5	Endrin ketone	4.9	J	4.9	J	µg/kg	S16 (OEPA) (07/09/96)	1/2	8.7	4.9				X	See text
5103-74-2	gamma-Chlordane	3.2	J	4.9	J	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	4.9	3.24	Region V	1.5		See Text
72-43-5	Methoxychlor	17	JP	18	J	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	18	13.6	Region V	1.3		SQ<1.5

Notes:

(1) Minimum/maximum detected concentration.

(2) Based on data collected from sampling locations: S15, S16, SED-1, SED-2, SED-3, SEDIMENT-1, SEDIMENT-2, SEDIMENT-3.

(3) Maximum concentration is used for screening.

(4) Toxicity Screening Level Sources:

Dutch MCP: Crommentuijn, T., M.D. Polder, and E.J. van de Plassche, 1997. Maximum permissible concentrations and negligible concentrations for metals; taking into account background. Report #601501.001, National Institute of Public Health and the Environment, Bilthoven, The Netherlands.

EPA-2003: Final Chronic Value, USEPA. 2003. Procedures for the derivation of equilibrium partitioning sediment benchmarks (ESBs) for the protection of benthic organisms: PAH mixtures. EPA-600-R-02-013.

Region V: USEPA Region V, 2003. Ecological Data Quality Levels, August 22, 2003.

SQRT: NOAA, 1999. Screening quick reference tables (SQRT). Hazmat Report 99-1. National Oceanic and Atmospheric Administration, Washington, DC.

(5) SQ (Screening Value) = Maximum detected / Screening Level

(6) Rationale Codes
Selection Reason : Maximum detected greater than SQ (SQ>1.5)
Deletion Reason : Maximum detected less than SQ (SQ<1.5)
Essential nutrient (NUT)
No screening value (NSV)

Definitions:

N/A = Not Applicable
J = Estimated.
P = Difference for detected Aroclor > 25% between 2 GC column.
µg/kg = micrograms per liter

VOCs - Volatile Organic Compounds

PCBs - Polychlorinated Biphenyls

TABLE 4.3

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN IN GROUNDWATER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Ecological Screening Level (4)		SQ (5)	COPEC Flag	Rationale for Contaminant Deletion or Selection (6)
	VOCs														
71-55-6	1,1,1-Trichloroethane	0.22	J	8.9		µg/L	MW-201 (05/10/00)	38/368	1 - 120	8.9	2400	EPA 2008	0.0		SQ<1.5
79-34-5	1,1,2,2-Tetrachloroethane	1	J	1	J	µg/L	MW-103 (05/28/98)	1/368	1 - 120	1	3700	EPA 2008	0.0		SQ<1.5
75-34-3	1,1-Dichloroethane	0.22	J	20000		µg/L	MW-101A (05/28/98)	109/376	0.5 - 120	20000	20100	Region V	1.0		SQ<1.5
75-35-4	1,1-Dichloroethene	0.24	J	2.5		µg/L	VAS-14 (11/18/08)	14/254	1 - 120	2.5	8280	Region V	0.0		SQ<1.5
95-63-6	1,2,4-Trimethylbenzene	0.5		0.6		µg/L	SD004A (02/23/96)	2/8	0.5	0.6	700	EPA 2008	0.0		SQ<1.5
95-50-1	1,2-Dichlorobenzene	0.21	J	0.5	J	µg/L	VAS-4 (11/06/08)	2/254	1 - 120	0.5	330	EPA 2008	0.0		SQ<1.5
107-06-2	1,2-Dichloroethane	0.25	J	34		µg/L	MW-101A (11/11/99)	9/376	0.5 - 120	34	21200	Region V	0.0		SQ<1.5
540-59-0	1,2-Dichloroethene (total)	2	J	480		µg/L	MW-101A (06/14/02)	24/116	1 - 10	480	21200	Region V	0.0		SQ<1.5
106-46-7	1,4-Dichlorobenzene	0.3	J	0.3	J	µg/L	VAS-4 (11/06/08)	1/254	1 - 120	0.3	330	EPA 2008	0.0		SQ<1.5
78-93-3	2-Butanone (MEK)	0.57	J	19		µg/L	VAS-12 (11/10/08)	18/254	10 - 1200	19	89600	Region V	0.0		SQ<1.5
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.57	J	2	J	µg/L	VAS-21B (06/05/09)	4/254	10 - 1200	2	443000	Region V	0.0		SQ<1.5
67-64-1	Acetone	1.1	J	30		µg/L	MW-101A (07/09/96)	10/368	1 - 1200	30	2500	Region V	0.0		SQ<1.5
71-43-2	Benzene	0.22	J	580		µg/L	VAS-21B (06/03/09)	61/376	1 - 120	580	5300	EPA 2008	0.1		SQ<1.5
75-27-4	Bromodichloromethane	0.5	J	1.3		µg/L	MW-202 (09/05/08)	2/254	1 - 120	1.3	540	Region V	0.0		SQ<1.5
75-25-2	Bromoform	0.6	J	0.6	J	µg/L	MW-101A (05/28/98)	1/368	1 - 120	0.6	6000	EPA 2008	0.0		SQ<1.5
75-15-0	Carbon disulfide	0.29	J	0.68	J	µg/L	VAS-5 (12/16/08)	6/254	1 - 120	0.68	94.1	N/A	0.0		SQ<1.5
108-91-7	Chlorobenzene	0.2	J	130		µg/L	VAS-11 (12/08/08)	26/368	1 - 120	130	880	EPA 2008	0.1		SQ<1.5
75-00-3	Chloroethane	0.36	J	22		µg/L	MW-102 (07/09/96)	12/368	1 - 120	22	10400	Region V	0.0		SQ<1.5
67-66-3	Chloroform (Trichloromethane)	0.18	J	3.1		µg/L	MW-202 (09/05/08)	13/254	1 - 120	3.1	1190	Region V	0.0		SQ<1.5
74-87-3	Chloromethane	0.34	J	0.44	J	µg/L	MW-103 (09/11/08)	2/254	1 - 120	0.44	51000	See text	0.0		SQ<1.5
156-59-2	cis-1,2-Dichloroethene	0.21	J	3900	J	µg/L	VAS-9 (11/18/08)	139/259	0.5 - 20	3900	784	Region V	5.0		SQ<1.5
110-82-7	Cyclohexane	0.12	J	2.5	J	µg/L	MW-215A (07/24/09)	125/251	1 - 120	2.5	328	See text	0.0		SQ<1.5
124-48-1	Dibromochloromethane	0.48	J	0.76	J	µg/L	MW-202 (09/05/08)	2/254	1 - 120	0.76	2050	Region V	0.0		SQ<1.5
100-41-4	Ethylbenzene	0.2	J	89		µg/L	VAS-5 (12/15/08)	35/362	0.5 - 120	89	790	EPA 2008	0.1		SQ<1.5
98-82-8	Isopropylbenzene (Cumene)	0.18	J	36		µg/L	VAS-5 (12/15/08)	7/251	1 - 120	36	266	See text	0.1		SQ<1.5
108-87-2	Methyl cyclohexane	0.52	J	14	J	µg/L	MW-215A (07/24/09)	17/251	1 - 120	14	264	See text	0.1		SQ<1.5
1634-04-4	Methyl Tert Butyl Ether	0.19	J	0.86	J	µg/L	VAS-9 (11/18/08)	9/251	5 - 620	0.86	51000	See text	0.0		SQ<1.5
75-09-2	Methylene chloride	0.5	J	51	B	µg/L	MW-209 (11/11/99)	20/368	1 - 120	51	4050	Region V	0.0		SQ<1.5
100-42-5	Styrene	0.57	J	0.9	J	µg/L	VAS-9 (11/19/08)	3/368	1 - 120	0.9	4690	Region V	0.0		SQ<1.5
127-18-4	Tetrachloroethene	0.29	J	4.6		µg/L	VAS-11 (12/08/08)	24/368	1 - 120	4.6	2000	EPA 2008	0.0		SQ<1.5
108-88-3	Toluene	0.17	J	180		µg/L	VAS-13 (12/01/08)	214/376	1 - 20	180	1600	EPA 2008	0.1		SQ<1.5
156-60-5	trans-1,2-Dichloroethene	0.19	J	3.2	J	µg/L	VAS-14 (11/17/08)	56/251	1 - 120	3.2	784	Region V	0.0		SQ<1.5
79-01-6	Trichloroethene	0.3	J	5100		µg/L	VAS-9 (11/18/08)	144/376	0.5 - 20	5100	1400	EPA 2008	3.6	X	SQ>1.5
75-01-4	Vinyl chloride	0.22	J	760		µg/L	VAS-9 (11/18/08)	147/376	0.5 - 20	760	646	Region V	1.2		SQ<1.5
1330-20-7	Xylenes (total)	0.47	J	75		µg/L	MW-215A (07/24/09)	27/368	2 - 250	75	700	EPA 2008	0.1		SQ<1.5

TABLE 4.3

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN IN GROUNDWATER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Ecological Screening Level (4)		SQ (5)	COPEC Flag	Rationale for Contaminant Deletion or Selection (6)
	SVOCs														
91-57-6	2-Methylnaphthalene	0.26		56		µg/L	MW-215A (07/24/09)	6/101	0.2 - 10	56	72.2	EPA 2003	0.8		SQ<1.5
106-44-5	4-Methylphenol	1.5	J	1.7		µg/L	MW-215A (07/24/09)	2/101	1 - 20	1.7	165000.0	Region V	0.0		SQ<1.5
83-32-9	Acenaphthene	0.21		10		µg/L	MW-215A (07/24/09)	5/101	0.2 - 10	10	55.9	EPA 2003	0.2		SQ<1.5
120-12-7	Anthracene	0.21		1.3		µg/L	MW-218B (07/21/09)	5/101	0.2 - 10	1.3	20.7	EPA 2003	0.1		SQ<1.5
56-55-3	Benzo(a)anthracene	0.21		1.3		µg/L	MW-218B (07/21/09)	4/101	0.2 - 10	1.3	2.2	EPA 2003	0.6		SQ<1.5
50-32-8	Benzo(a)pyrene	0.56		1.1		µg/L	VAS-19 (12/15/08)	5/101	0.2 - 10	1.1	1.0	EPA 2003	1.1		SQ<1.5
205-99-2	Benzo(b)fluoranthene	0.81		1.2		µg/L	VAS-2 (01/08/09)	4/101	0.2 - 10	1.2	0.7	EPA 2003	1.8	X	SQ>1.5
191-24-2	Benzo(g,h,i)perylene	0.29		0.9		µg/L	VAS-2 (01/08/09)	3/101	0.2 - 10	0.9	7.6	Region V	0.1		SQ<1.5
207-08-9	Benzo(k)fluoranthene	0.29		0.45		µg/L	P-211 (10/03/08)	3/101	0.2 - 10	0.45	0.6	EPA 2003	0.7		SQ<1.5
92-52-4	Biphenyl	1.2		1.2		µg/L	MW-215A (07/24/09)	1/98	1 - 20	1.2	190.0	EPA 2008	0.0		SQ<1.5
117-81-7	bis(2-Ethylhexyl)phthalate	0.85	J	7.9		µg/L	VAS-20 (01/11/09)	16/102	2 - 40	7.9	0.3	Region V	26.3	X	SQ>1.5
85-68-7	Butyl benzylphthalate	0.95	J	1.1		µg/L	VAS-6 (01/07/09)	3/101	1 - 20	1.1	58.0	EPA 2008	0.0		SQ<1.5
105-60-2	Caprolactam	2.4	J	20		µg/L	MW-202 (09/05/08)	8/97	5 - 100	20	100000.0	See text	0.0		SQ<1.5
86-74-8	Carbazole	0.92	J	3.3		µg/L	P-211 (10/03/08)	3/98	1 - 20	3.3	1030.0	See text	0.0		SQ<1.5
218-01-9	Chrysene	0.2		1.7		µg/L	P-211 (10/03/08)	4/101	0.2 - 10	1.7	2.0	EPA 2003	0.8		SQ<1.5
132-64-9	Dibenzofuran	0.19	J	3.2		µg/L	MW-215A (07/24/09)	4/101	1 - 20	3.2	4.0	EPA 2008	0.8		SQ<1.5
84-66-2	Diethylphthalate	1.2		1.3		µg/L	VAS-6 (01/07/09)	2/101	1 - 20	1.3	110.0	Region V	0.0		SQ<1.5
84-74-2	Di-n-butylphthalate	0.76	J	3.5		µg/L	VAS-21 (10/28/08)	4/101	1 - 20	3.5	9.7	Region V	0.4		SQ<1.5
117-84-0	Di-n-octylphthalate	1	J	1	J	µg/L	MW-101A (07/09/96)	1/101	1 - 20	1	30.0	Region V	0.0		SQ<1.5
206-44-0	Fluoranthene	0.19	J	5.2		µg/L	P-211 (10/03/08)	9/101	0.2 - 10	5.2	7.1	EPA 2003	0.7		SQ<1.5
86-73-7	Fluorene	0.29		2.2		µg/L	MW-215A (07/24/09)	5/101	0.2 - 10	2.2	39.3	EPA 2003	0.1		SQ<1.5
193-39-5	Indeno(1,2,3-cd) pyrene	0.24		0.88		µg/L	VAS-2 (01/08/09)	3/101	0.2 - 10	0.88	4.3	Region V	0.2		SQ<1.5
91-20-3	Naphthalene	0.19	J	17		µg/L	MW-215A (07/24/09)	7/101	0.2 - 10	17	193.5	EPA 2003	0.1		SQ<1.5
85-01-8	Phenanthrene	0.36		5.9		µg/L	P-211 (10/03/08)	8/101	0.2 - 10	5.9	19.1	EPA 2003	0.3		SQ<1.5
108-95-2	Phenol	130	EB	130	EB	µg/L	MW-101A (07/09/96)	1/101	1 - 20	130	120000.0	Region V	0.0		SQ<1.5
129-00-0	Pyrene	0.27		3.9		µg/L	P-211 (10/03/08)	7/101	0.2 - 10	3.9	10.1	EPA 2003	0.4		SQ<1.5
	Metals														
7429-90-5	Aluminum	98.4	J	10000		µg/L	MW-101A (07/09/96)	1/34	200	10000	87	NWQC	114.9		Diss. SQ<1.5
7440-36-0	Antimony	0.23	B	6.7		µg/L	P-211 (10/03/08)	6/34	2 - 3	6.7	180	Region V	0.0		SQ<1.5
7440-38-2	Arsenic	0.51	B	3200		µg/L	VAS-11 (12/08/08)	257/276	4	3200	150	OWQC	21.3		Diss. SQ<1.5
7440-39-3	Barium	84.4	J	2220		µg/L	MW-215A (07/24/09)	40/40	--	2220	220	Region V	10.1	X	Diss. SQ>1.5
7440-43-9	Cadmium	0.28	B	0.28	B	µg/L	P-211 (10/03/08)	1/55	1	0.28	6.6	OWQC	0.0		SQ<1.5
7440-70-2	Calcium	20500		224000		µg/L	MW-101A (07/09/96)	34/34	--	224000	Nutrient	OWQC			NUT
7440-47-3	Chromium	1.2	J	69		µg/L	MW-102 (01/06/98)	15/57	1 - 10	69	230	OWQC	0.3		SQ<1.5
7440-48-4	Cobalt	2	B	12.3	J	µg/L	MW-101A (07/09/96)	5/34	1 - 50	12.3	24	Region V	0.5		SQ<1.5
7440-50-8	Copper	3.1	J	39.5		µg/L	MW-215A (07/24/09)	6/34	25	39.5	29	OWQC	1.4		SQ<1.5
57-12-5	Cyanide	11		21		µg/L	MW-217 (07/28/09)	3/18	3 - 10	21	5.2	NWQC	4.0		Diss. SQ<1.5

TABLE 4.3

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN IN GROUNDWATER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Ecological Screening Level (4)		SQ (5)	COPEC Flag	Rationale for Contaminant Deletion or Selection (6)
	Metals (cont.'d)														
7439-89-6	Iron	106		20600		µg/L	MW-101A (07/09/96)	31/34	100	20600	1000	NWQC	20.6	X	Diss. SQ>1.5
7439-92-1	Lead	0.21	B	1940		µg/L	VAS-5 (12/15/08)	231/276	1	1940	30	OWQC	64.7		Diss. SQ<1.5
7439-95-4	Magnesium	4330	B	93200		µg/L	MW-217 (07/28/09)	34/34	--	93200	Nutrient				NUT
7439-96-5	Manganese	8.5	B	1080		µg/L	MW-207 (07/27/09)	34/34	--	1080	6500	Mich	0.2		SQ<1.5
7440-02-0	Nickel	1.1	J	29.7	J	µg/L	MW-101A (07/09/96)	7/34	40	29.7	170	OWQC	0.2		SQ<1.5
7440-09-7	Potassium	2020	B	114000		µg/L	MW-101A (07/09/96)	34/34	--	114000	Nutrient	OWQC			NUT
7782-49-2	Selenium	1.3	B'	25.3		µg/L	MW-202 (07/28/09)	7/34	4 - 5	25.3	4.6	OWQC	5.5	X	SQ>1.5
7740-23-5	Sodium	11800		126000		µg/L	MW-208 (09/05/08)	34/34	--	126000	Nutrient				NUT
7440-28-0	Thallium	0.41	B	4.4	J	µg/L	MW-101A (07/09/96)	2/34	1 - 4	4.4	10	Region V	0.4		SQ<1.5
7440-62-2	Vanadium	0.92	B	24.2	B	µg/L	P-211 (10/03/08)	3/34	1 - 50	24.2	12	Region V	2.0		Diss. SQ<1.5
7440-66-6	Zinc	5.4	B	445		µg/L	Valley Asphalt Well 1 (10/12/08)	8/34	20 - 26	445	380	OWQC	1.2		SQ<1.5
	Dissolved Metals														
7440-36-0	Antimony	0.25		0.45		µg/L	MW-218A (07/21/09)	3/15	2	0.45	80	Revion V	0.0		SQ<1.5
7440-38-2	Arsenic	0.55	B	29.1		µg/L	MW-203 (07/24/09)	51/51	--	29.1	150	OWQC	0.2		SQ<1.5
7440-39-3	Barium	104	B	2140		µg/L	MW-215A (07/24/09)	15/15	--	2140	220	Region V	9.7	X	SQ>1.5
7440-70-2	Calcium	51300		138000		µg/L	MW-202 (07/28/09)	15/15	--	138000	Nutrient				NUT
7440-48-4	Cobalt	1.8	B	1.8	B	µg/L	MW-217 (07/28/09)	1/15	50	1.8	24	Region V	0.1		SQ<1.5
7439-89-6	Iron	320		8500		µg/L	MW-215A (07/24/09)	29/35	100	8500	1000	NWQC	8.5	X	SQ>1.5
7439-92-1	Lead	0.18	B	4		µg/L	VAS-11 (12/09/08)	9/51	1	4	30	OWQC	0.1		SQ<1.5
7439-95-4	Magnesium	23300		93100		µg/L	MW-217 (07/28/09)	15/15	--	93100	Nutrient				NUT
7439-96-5	Manganese	0.65	B	1070		µg/L	MW-217 (07/28/09)	15/15	--	1070	6500	OWQC	0.2		SQ<1.5
7440-02-0	Nickel	5.1	B	5.1	B	µg/L	MW-217 (07/28/09)	1/15	40	5.1	170	OWQC	0.0		SQ<1.5
7440-09-7	Potassium	1960	B	33400	B	µg/L	MW-204 (07/28/09)	15/15	--	33400	Nutrient				NUT
7782-49-2	Selenium	1.7	B	26.3		µg/L	MW-202 (07/28/09)	2/15	5	26.3	4.6	OWQC	5.7	X	SQ>1.5
7740-23-5	Sodium	12400		112000		µg/L	MW-203 (07/24/09)	15/15	--	112000	Nutrient				NUT
	PCBs														
53469-21-9	Aroclor-1242 (PCB-1242)	0.19	J	0.19	J	µg/L	MW-202 (07/28/09)	1/33	0.2 - 1	0.19	0.014	NWQC	13.6	X	SQ>1.5
11097-69-1	Aroclor-1254 (PCB-1254)	0.19	J	0.19	J	µg/L	MW-215A (07/24/09)	1/33	0.2 - 1	0.19	0.014	NWQC	13.6	X	SQ>1.5
11096-82-5	Aroclor-1260 (PCB-1260)	0.16	J	0.19	J	µg/L	MW-204 (07/28/09)	2/33	0.2 - 1	0.19	0.014	NWQC	13.6	X	SQ>1.5

TABLE 4.3

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN IN GROUNDWATER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Ecological Screening Level (4)		SQ (5)	COPEC Flag	Rationale for Contaminant Deletion or Selection (6)
	Pesticides														
72-55-9	4,4'-DDE	0.017	J	0.017	J	µg/L	MW-215A (07/24/09)	1/33	0.05 - 0.1	0.017	0.1	See Text	0.2		SQ<1.5
319-84-6	alpha-BHC	0.034	J	0.034	J	µg/L	MW-215A (07/24/09)	1/33	0.05	0.034	12.4	Region V	0.0		SQ<1.5
319-85-7	beta-BHC	0.011	J	0.011	J	µg/L	MW-204 (09/10/08)	1/33	0.05	0.011	0.495	Region V	0.0		SQ<1.5
608-73-1	delta-BHC	0.013	J	0.02	J	µg/L	MW-202 (09/05/08)	3/33	0.05	0.02	667	Region V	0.0		SQ<1.5
60-57-1	Dieldrin	0.013	J	0.013	J	µg/L	MW-207 (07/27/09)	1/33	0.05 - 0.1	0.013	0.056	NWQC	0.2		SQ<1.5
76-44-8	Heptachlor	0.0082	PJ	0.051	PJ	µg/L	MW-101A (07/09/96)	4/33	0.05	0.051	0.091	See Text	0.6		SQ<1.5

Notes:

(1) Minimum/maximum detected concentration.

(2) Based on data collected from sampling locations: MW-101A, MW-102, MW-103, MW-201, MW-202, MW-203, MW-204, MW-206, MW-207, MW-208, MW-209A, MW-210, MW-212, MW-215A, MW-217, MW-218A, MW-218B, P-211, SD001, SD002, SD004A, SD005, Valley Ashphalt Well 1, Valley Ashphalt Well 2, VAS-1, VAS-2, VAS-3, VAS-4, VAS-5, VAS-6, VAS-7, VAS-8, VAS-9, VAS-11, VAS-12, VAS-13, VAS-14, VAS-15, VAS-17, VAS-29, VAS-20, VAS-21, VAS-21B, VAS-22.

(3) Maximum concentration is used for screening.

(4) Toxicity Screening Level Sources:

EPA 2003: Final Chronic Value, USEPA. 2003. Procedures for the derivation of equilibrium partitioning sediment benchmarks (ESBs) for the protection of benthic organisms: PAH mixtures. EPA-600-R-02-013.

EPA 2008: USEPA. 2008. Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: Compendium of Tier 2 Values for Nonionic Organics. EPA-600-R-02-016. Office of Research and Development. Washington, DC 20460

MICH: MDEQ. 2000. Rule 57 Water Quality Values. Michigan Department of Environmental Quality. Criterion accessible from here: http://www.michigan.gov/deq /1,1607,7-135-3313_3686_3728-11383--CI,00.html

NWQC: USEPA. 2006. National recommended water quality criteria. United States Environmental Protection Agency, Office of Water, Washington, DC. EPA-4304T.

OWQC: OEPA, 2009. State of Ohio water quality standards. Chapter 3745-1 of the Administrative Code.

Region V: USEPA Region V, 2003. Ecological Data Quality Levels, August 22, 2003.

(5) SQ (Screening Value) = Maximum detected / Screening Level

(6) Rationale Codes
Selection Reason : Maximum detected greater than SQ (SQ>1.5)
Deletion Reason : Maximum detected less than SQ (SQ<1.5)
Essential nutrient (NUT)

Definitions:

N/A = Not Applicable
J = Estimated.
E = Exceed calibration range of GC/MS instrument
B = Method blank contamination.
P = Difference for detected Aroclor > 25% between 2 GC column.
µg/kg = micrograms per liter

ft bgs = feet below ground surface

ng/kg = nanograms per kilogram

VOCs - Volatile Organic Compounds
PCBs - Polychlorinated Biphenyls

TABLE 4.4

RESCREENING OF INITIAL GROUNDWATER COPECS FOR SENTINEL WELLS FOR GMR
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater in Sentinel Wells for GMR
Exposure Medium: Groundwater

CAS Number	Chemical	Maximum Concentration	Units	Detection Frequency (1)	Concentration Used for Screening (2)	Toxicity Screening Level	Source (3)	SQ (4)	COPEC Flag	Rationale for Contaminant Deletion or Selection (5)
	VOCs									
79-01-6	Trichloroethene	22	µg/L	36/64	22	1400	EPA 2008	0.0		SQ<1.5
	SVOCs									
205-99-2	Benzo(b)fluoranthene	ND	µg/L	0/25	0	0.7	EPA 2003	0.0	X	??
117-81-7	bis(2-Ethylhexyl)phthalate	7.9	µg/L	6/25	7.9	0.3	Region V	26.3		See Text
	Dissolved Metals									
7440-39-3	Barium	261	µg/L	6/6	261	220	Region V	1.2		SQ<1.5
7439-89-6	Iron	3770	µg/L	10/14	3770	1000	NWQC	3.8		See Text
7782-49-2	Selenium	1.7	µg/L	1/6	1.7	4.6	OWQC	0.4		SQ<1.5
	PCBs									
53469-21-9	Aroclor-1242 (PCB-1242)	ND	µg/L	0/13	0	0.014	NWQC	0.0		SQ<1.5
11097-69-1	Aroclor-1254 (PCB-1254)	ND	µg/L	0/13	0	0.014	NWQC	0.0		SQ<1.5
11096-82-5	Aroclor-1260 (PCB-1260)	ND	µg/L	0/13	0	0.014	NWQC	0.0		SQ<1.5

Notes:

(1) Wells used were VAS-20, MW-218A/B, MW-102, MW-103, MW-201, MW-206, MW-207, VAS-01, VAS-06, VAS-05, and VAS-4.

(2) Maximum concentration is used for screening.

(3) Toxicity Screening Level Sources:

partitioning sediment benchmarks (ESBs) for the protection of benthic organisms: PAH

Benchmarks (ESBs) for the Protection of Benthic Organisms: Compendium of Tier 2 Values

NWQC: USEPA. 2006. National recommended water quality criteria. United States Environmental Protection Agency, Office of Water, Washington, DC. EPA-4304T.

OWQC: OEPA, 2009. State of Ohio water quality standards. Chapter 3745-1 of the Administrative Code.

Region V: USEPA Region V, 2003. Ecological Data Quality Levels, August 22, 2003.

(4) SQ (Screening Value) = Maximum detected / Screening Level

(5) Rationale Codes

Selection Reason : Maximum detected greater than SQ (SQ>1.5)

Deletion Reason : Maximum detected less than SQ (SQ<1.5)

Essential Nutrient (NUT)

TABLE 4.5

RESCREENING OF INITIAL GROUNDWATER COPECS FOR SENTINEL WELLS FOR QUARRY POND
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater in Sentinel Wells for Quarry Pond
Exposure Medium: Groundwater

CAS Number	Chemical	Maximum Concentration	Units	Detection Frequency (1)	Concentration Used for Screening (2)	Toxicity Screening Level	Source (3)	SQ (4)	COPEC Flag	Rationale for Contaminant Deletion or Selection (5)
	VOCs									
79-01-6	Trichloroethene	ND	µg/L	0/27	0	1400	EPA 2008	0.0		SQ<1.5
	SVOCs									
205-99-2	Benzo(b)fluoranthene	1.1	µg/L	2/14	1.1	0.7	EPA 2003	1.6		See Text
117-81-7	bis(2-Ethylhexyl)phthalate	ND	µg/L	0/14	0	0.3	Region V	0.0		SQ<1.5
	Dissolved Metals									
7440-39-3	Barium	313	µg/L	2/2	313	220	Region V	1.4		SQ<1.5
7439-89-6	Iron	3000	µg/L	6/6	3000	1000	NWQC	3.0		See Text
7782-49-2	Selenium	ND	µg/L	0/2	0	4.6	OWQC	0.0		SQ<1.5
	PCBs									
53469-21-9	Aroclor-1242 (PCB-1242)	ND	µg/L	0/6	0	0.014	NWQC	0.0		SQ<1.5
11097-69-1	Aroclor-1254 (PCB-1254)	ND	µg/L	0/6	0	0.014	NWQC	0.0		SQ<1.5
11096-82-5	Aroclor-1260 (PCB-1260)	ND	µg/L	0/6	0	0.014	NWQC	0.0		SQ<1.5

Notes:

(1) Wells used were MW-101A, P-211, MW-209, VAS-19, MW-209A, MW-212, and VAS-22.

(2) Maximum concentration is used for screening.

(3) Toxicity Screening Level Sources:

equilibrium partitioning sediment benchmarks (ESBs) for the protection of benthic

NWQC: USEPA. 2006. National recommended water quality criteria. United States Environmental Protection Agency, Office of Water, Washington, DC. EPA-4304T.

OWQC: OEPA, 2009. State of Ohio water quality standards. Chapter 3745-1 of the Administrative Code.

Region V: USEPA Region V, 2003. Ecological Data Quality Levels, August 22, 2003.

(4) SQ (Screening Value) = Maximum detected / Screening Level

(5) Rationale Codes

Selection Reason : Maximum detected greater than SQ (SQ>1.5)

Deletion Reason : Maximum detected less than SQ (SQ<1.5)

µg/kg = micrograms per liter

VOCs - Volatile Organic Compounds

PCBs - Polychlorinated Biphenyls

TABLE 4.6

LIST OF INTITAL COPECS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

COPEC	Groundwater [1]	Surface soil	Sediment	Off-Site sediment
2-Methylnaphthalene			X	
Acenaphthene			X	
Acenaphthylene			X	
Anthracene			X	
Benzo(a)anthracene		X	X	
Benzo(a)pyrene		X	X	
Benzo(b)fluoranthene	X	X	X	
Benzo(g,h,i)perylene		X	X	
Benzo(k)fluoranthene		X	X	
bis(2-Ethylhexyl)phthalate	X	X	X	X
Butyl benzylphthalate		X		
Chrysene		X	X	
Dibenz(a,h)anthracene			X	
Di-n-butylphthalate		X		
Fluoranthene			X	
Fluorene			X	
Indeno(1,2,3-cd) pyrene		X	X	
Methoxychlor				X
Naphthalene			X	
Phenanthrene			X	
Pyrene		X	X	
Total PAH ESB			X	X
Total PAH ESB * 2.3			X	X
Acetone				X
Trichloroethene	X			
alpha-Chlordane			X	X
Dieldrin			X	X
Endrin			X	X
Endrin aldehyde			X	
Endrin ketone			X	
gamma-Chlordane				X
Antimony		X		
Arsenic		X		
Barium	X	X		
Dissolved barium	X			
Cadmium		X		
Chromium		X		
Cobalt		X		
Copper		X		

TABLE 4.6

LIST OF INITIAL COPECS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

COPEC	Groundwater [1]	Surface soil	Sediment	Off-Site sediment
Cyanide		X		X
Iron	X			
Dissolved iron	X			
Lead		X		
Manganese		X		
Nickel		X		
Selenium	X	X		
Dissolved selenium	X			
Silver		X		
Thallium		X		
Vanadium		X		
Zinc		X		
Aroclor-1242 (PCB-1242)	X			
Aroclor-1254 (PCB-1254)	X			
Aroclor-1260 (PCB-1260)	X			
Total PCBs		X		
Sulfide		X		

Notes:
(1) No groundwater COPECs retained after rescreening.

TABLE 4.7

PARAMETERS FOR FOOD CHAIN MODELS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Species	Body Weight (kg)	Ecological Guild	Contaminated Prey	Feeding Rate (kg WW / kg BW-day)	Drinking Rate (kg water / kg BW-day)	Soil Ingestion (kg DW / kg BW-day)
Brown Bat	0.007	Insectivore	Aquatic Insects	0.33	0.16	0.000
Tree Swallow	0.02	Insectivore	Aquatic Insects	0.76	0.23	0.000
Short-tailed Shrew	0.015	Primary Predator	Worms	0.53	0.223	0.014
Woodcock	0.2	Primary Predator	Worms	0.77	0.10	0.014
Red Fox	4.035	Top predator	Small mammals	0.1	0.085	0.001
Red-tailed hawk	1.2	Top predator	Small mammals	0.1	0.057	0.001
Mink	0.97	Piscivore	Fish	0.16	0.079	0.002
Great Blue Heron	2.2	Piscivore	Fish	0.18	0.045	0.002

Notes:
" WW", "DW", and "BW" refer to wet weight, dry weight, and body weight. Parameters from EPA (1993a) except for bat, which were obtained from Baron et al. 1999.

TABLE 4.8

TOXICITY REFERENCE VALUES (TRV) AND SOURCES FOR FOOD CHAIN MODELS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	TRV for Mammals					TRV for Birds				
	Test Species	TRV (mg/kg/d)	Toxicity benchmark (LOAEL, mg/kg/d)	MATC Threshold	Source	Test Species	TRV (mg/kg/d)	LOAELs	MATC Threshold	Source
Antimony	Mouse	1.25E-01	1.25E+00	3.95E-01	a					
Arsenic	Mouse	1.26E-01	1.26E+00	3.98E-01	a	Mallard	5.14E+00	1.28E+01	8.11E+00	a
Barium	Rat	5.10E+00	1.98E+01	1.00E+01	a	Chick (1-day old)	2.08E+01	4.17E+01	2.95E+01	a
Cadmium	Rat	1.00E+00	1.00E+01	3.16E+00	a	Mallard	1.45E+00	2.00E+01	5.39E+00	a
Chromium	Rat	2.74E+03	2.74E+04	8.66E+03	a	Several	2.66E+00	5.00E+00	3.65E+00	f
Cobalt	Rat	5.00E+00	2.00E+01	1.00E+01	b					
Copper	Mink	1.17E+01	1.54E+01	1.34E+01	a	Chick (1-day old)	4.70E+01	6.17E+01	5.39E+01	a
Cyanide	Rat	6.87E+01	6.87E+02	2.17E+02	a					
Fluoride	Mink	3.14E+01	5.28E+01	4.07E+01	a	Screech owl	7.80E+00	3.20E+01	1.58E+01	a
Lead	Rat	8.00E+00	8.00E+01	2.53E+01	a	Japanese quail	1.13E+00	1.13E+01	3.57E+00	a
Manganese	Rat	8.80E+01	2.84E+02	1.58E+02	a	Japanese quail	9.97E+02	9.77E+03	3.12E+03	a
Nickel	Rat	4.00E+01	8.00E+01	5.66E+01	a	Mallard duckling	7.74E+01	1.07E+02	9.10E+01	a
Selenium	Rat	2.00E-01	3.30E-01	2.57E-01	a	Mallard duck	5.00E-01	1.00E+00	7.07E-01	a
Silver	Pig	6.02E+00	6.02E+01	1.90E+01	c	Turkey	2.02E+00	2.02E+01	6.39E+00	g
Thallium	Rat	7.40E-03	7.40E-02	2.34E-02	a					
Vanadium	Rat	2.10E-01	2.10E+00	6.64E-01	a	Mallard duck	1.14E+01	1.14E+02	3.60E+01	a
Zinc	Rat	1.60E+02	3.20E+02	2.26E+02	a	White Leghorn chicken	1.45E+01	1.31E+02	4.36E+01	a
Benzo(a)pyrene*	Mouse	1.00E+00	1.00E+01	3.16E+00	a	Chicken	4.00E+01	4.00E+02	1.26E+02	h
Bis(2-ethylhexyl) phthalate	Mouse	1.83E+01	1.83E+02	5.79E+01	a	Ringed dove	1.10E+00	1.10E+01	3.48E+00	a
Butylbenzyl phthalate	Rat	1.59E+02	4.70E+02	2.73E+02	d	Based on Di-n-butylphthalate	1.10E-01	1.10E+00	3.48E-01	a
Di-n-butylphthalate	Mouse	5.50E+02	1.83E+03	1.00E+03	a	Ringed Dove	1.10E-01	1.10E+00	3.48E-01	a
Pyrene	Mouse	7.50E+01	7.50E+02	2.37E+02	d	Chicken	4.00E+01	4.00E+02	1.26E+02	h
PCB	Rat	3.20E-01	6.80E-01	4.66E-01	e	Pheasant	1.80E-01	1.80E+00	5.69E-01	a
Chlordane	Mouse	4.60E+00	9.20E+00	6.51E+00	a	Red-winged blackbird	2.14E+00	1.07E+01	4.79E+00	a
Dieldrin	Rat	2.00E-02	2.00E-01	6.32E-02	a	Barn Owl	7.70E-02	7.70E-01	2.43E-01	a
Endrin	Mouse	9.20E-02	9.20E-01	2.91E-01	a	Screech Owl and Duck	5.48E-02	5.48E-01	1.73E-01	a
2,3,7,8-TCDD TEQ	Rat	1.00E-06	1.00E-05	3.16E-06	a	Pheasant	1.40E-05	1.40E-04	4.43E-05	a

Notes:

These TRVs are NOAELS (no observed adverse effects levels) . Mammal and bird TRVs for benzo(a)pyrene also applied to other high molecular weight PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, and pyrene (birds only)).

a. Sample, B.E., D.M. Opresko, and G.W. Suter II, 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. ES/ER/TM 86/R3. Oak Ridge National Laboratory, Oak Ridge, TN.
b. Nation, J. R., A. E. Bourgeois, D. E. Clark, et al., 1983. The effects of chroic cobalt exposure on behavior and metallothionein levels in the adult rat. Neurobehav Toxicol Teratol 5:9-15.
c. Van Vleet, J. F., 1976. Induction of lesions of selenium vitamin E deficiency in pigs fed silver. American Journal of Veterinary Research. 37(12): 1415-1420.
d. EPA, 1999. Integrated risk information system (IRIS). US EPA On-line Database of Toxicity Values, Office of Research amd Development, United States Environmental Protection Agency, Environmental Criteria and Assessment Office, Cincinnati, OH.
e. Linder, R.E., T.B. Gaines and R.D. Kimbrough. 1974. The Effect of Polychlorinated Biphenyls on rat Reproduction. Food and Cosmetic Toxicology.
f. USEPA, 2005. Ecological soil screening level for chromium, interim final. OSWER Directive 9285.7- 66.
g. Jensen, L. S., R. P. Peterson, and L. Falen, 1974. Inducement of enlarged hearts and muscular dystrophy in turkey poults with dietary silver. Poultry Science. 53(1): 57-64.
h. Rigdon, R.H. and J. Neal, 1963. Absorption and excretion of benzpyrene observation in the duck, chicken, mouse and dog. Texas Rep. Biol. And Med. 21 (2): 247 261.

TABLE 4.9

ESTIMATION OF COPEC CONCENTRATIONS IN TERRESTRIAL FOOD CHAIN
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	Soil 95% UCL	Soil Mean	Worm 95% UCL	Worm Mean	Small Mammal 95% UCL	Small Mammal Mean
Antimony	39.1	16.9	3.8	1.6	0.06	0.02
Arsenic	51.3	25.7	0.6	0.4	0.05	0.03
Barium	6604.5	803.3	52.8	6.4	28.75	6.58
Cadmium	7.7	3.3	6.7	3.4	0.44	0.29
Chromium	34.3	26.1	1.5	1.5	0.78	0.64
Cobalt	10.7	8.4	0.2	0.2	0.06	0.05
Copper	95324.3	9146.8	17.6	9.5	10.09	7.19
Lead	3514.3	990.9	93.5	33.7	9.98	5.70
Manganese	383.9	303.8	4.1	3.5	1.97	1.56
Nickel	267.5	65.6	45.4	11.1	2.64	1.37
Silver	1.4	0.7	0.6	0.3	0.00	0.00
Selenium	4.0	2.9	0.4	0.3	0.28	0.25
Thallium	2.0	1.4	0.0	0.0	0.03	0.02
Vanadium	39.7	29.4	0.3	0.2	0.27	0.20
Zinc	2081.7	919.7	167.8	128.3	38.43	36.18
PCB	1.2	0.6	0.8	0.3	0.12	0.06
TCDD TEQ	1.20E-05	6.0E-06	8.3E-06	3.7E-06	2.4E-06	1.2E-06
Benzo(a)anthracene	3.1	1.1	0.3	0.1	0.03	0.011
Benzo(a)pyrene	1.6	0.8	0.2	0.1	0.02	0.008
Benzo(b)fluoranthene	3.7	1.3	0.4	0.1	0.04	0.013
Benzo(g,h,i)perylene	1.3	0.6	0.1	0.1	0.01	0.006
Benzo(k)fluoranthene	1.4	0.8	0.1	0.1	0.01	0.008
Chrysene	2.5	0.9	0.2	0.1	0.02	0.009
Indeno(1,2,3-cd) pyrene	1.3	0.7	0.1	0.1	0.01	0.007
Pyrene	4.5	1.6	0.4	0.2	0.04	0.016
Bis(2-Ethylhexyl)phthalate	0.4	0.2	0.0	0.0	0.00	0.002
Butyl benzylphthalate	6.3	0.9	0.6	0.1	0.06	0.009
Di-n-butylphthalate	0.3	0.1	0.0	0.0	0.00	0.001

Notes:
See text for methods used to estimate prey concentrations.
Concentrations in mg/kg, dry weight for soil and wet weight for biota.

TABLE 4.10

ESTIMATION OF COPEC CONCENTRATIONS IN AQUATIC BENTHOS AND FISH
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	Units	95% UCL Value in Sediments	Mean Value in Sediments	Predicted 95% UCL in Benthos	Predicted Mean in Benthos
Total Chlordane	mg/kg	0.02	0.01	0.03	0.02
Dieldrin	mg/kg	0.01	0.01	0.02	0.01
Total Endrin	mg/kg	0.05	0.03	0.08	0.05
PCB	mg/kg	0.66	0.35	0.73	0.39
Benzo(a)anthracene	mg/kg	1.5	0.995	0.44	0.29
Benzo(a)pyrene	mg/kg	1.8	1.13	0.52	0.33
Benzo(b)fluoranthene	mg/kg	2.5	1.65	0.73	0.48
Benzo(g,h,i)perylene	mg/kg	2	1.245	0.58	0.36
Benzo(k)fluoranthene	mg/kg	0.95	0.625	0.28	0.18
Chrysene	mg/kg	1.5	1.025	0.44	0.30
Dibenz(a,h)anthracene	mg/kg	0.48	0.3	0.14	0.09
Fluoranthene	mg/kg	2.6	1.85	0.75	0.54
Indeno(1,2,3-cd) pyrene	mg/kg	1.9	1.18	0.55	0.34
Pyrene	mg/kg	3	2.15	0.87	0.62
Bis(2-Ethylhexyl)phthalate	mg/kg	0.47	0.45	0.14	0.13

Notes:

See text for methods used to estimate concentrations in benthos.

Concentrations in mg/kg, dry weight for soil and wet weight for biota.

TABLE 4.11

ASSESSMENT OF RISK TO CONSUMERS OF SOIL INVETEBRATES: SHREW AND WOODCOCK
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	*Toxicity Reference Value (mg/kg/day)*	*Feeding Rate (mg/kg/day)*	*95% UCL Predicted Conc. In Biota*	*Mean Predicted Conc. In Biota*	*95% UCL Dose, (mg/kg/day)*	*Mean Dose (mg/kg/day)*	*95% UCL SQ*	*Mean SQ*
				Shrew				
Antimony	0.13	0.53	3.75	1.62	2.5	1.09	**20.3**	**8.7**
Arsenic	0.13	0.53	0.62	0.38	1.0	0.56	**8.3**	**4.5**
Barium	5.10	0.53	52.84	6.43	120.5	14.65	**23.6**	**2.9**
Cadmium	1.00	0.53	6.73	3.42	3.7	1.86	**3.7**	**1.9**
Chromium	2740.0	0.53	1.51	1.54	1.3	1.18	0.0	0.0
Cobalt	2.0	0.53	0.21	0.16	0.3	0.21	0.1	0.1
Copper	11.7	0.53	17.62	9.49	1343.9	133.09	**114.8**	**11.4**
Lead	8.0	0.53	93.53	33.67	98.8	31.72	**12.3**	**4.0**
Manganese	88.0	0.53	4.12	3.51	7.6	6.12	0.1	0.1
Nickel	40.0	0.53	45.36	11.12	27.8	6.81	0.7	0.2
Silver	6.40	0.53	0.55	0.30	0.3	0.17	0.0	0.0
Selenium	0.2	0.53	0.41	0.32	0.3	0.21	1.4	1.1
Thallium	0.01	0.53	0.03	0.02	0.0	0.03	**5.8**	**4.2**
Vanadium	0.2	0.53	0.27	0.20	0.7	0.52	**3.3**	**2.5**
Zinc	160.0	0.53	167.78	128.34	118.1	80.90	0.7	0.5
PCB	0.3	0.53	0.80	0.35	0.4	0.19	1.4	0.6
TCDD TEQ	1.0E-06	0.53	0.00	0.00	0.0	0.00	**4.6**	**2.0**
Benzo(a)anthracene	1.0	0.53	0.31	0.11	0.2	0.07	0.2	0.1
Benzo(a)pyrene	1.0	0.53	0.16	0.08	0.1	0.05	0.1	0.1
Benzo(b)fluoranthene	1.0	0.53	0.37	0.13	0.2	0.09	0.2	0.1
Benzo(g,h,i)perylene	1.0	0.53	0.13	0.06	0.1	0.04	0.1	0.0
Benzo(k)fluoranthene	1.0	0.53	0.14	0.08	0.1	0.05	0.1	0.1
Chrysene	1.0	0.53	0.25	0.09	0.2	0.06	0.2	0.1
Pyrene	75.0	0.53	0.45	0.16	0.3	0.11	0.0	0.0
Bis(2-Ethylhexyl)phthalate	18.3	0.53	0.04	0.02	0.0	0.01	0.0	0.0
Butyl benzylphthalate	159.0	0.53	0.63	0.09	0.4	0.06	0.0	0.0
Di-n-butylphthalate	550.0	0.53	0.03	0.01	0.0	0.01	0.0	0.0

TABLE 4.11

ASSESSMENT OF RISK TO CONSUMERS OF SOIL INVETEBRATES: SHREW AND WOODCOCK
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	*Toxicity Reference Value (mg/kg/day)*	*Feeding Rate (mg/kg/day)*	*95% UCL Predicted Conc. In Biota*	*Mean Predicted Conc. In Biota*	*95% UCL Dose, (mg/kg/day)*	*Mean Dose (mg/kg/day)*	*95% UCL SQ*	*Mean SQ*
	Woodcock							
Antimony	0.13	0.77	3.8	1.6	3.4	1.48	**27.5**	**11.9**
Arsenic	5.1	0.77	0.6	0.4	1.2	0.65	0.2	0.1
Barium	20.8	0.77	52.8	6.4	133.1	16.20	**6.4**	0.8
Cadmium	1.5	0.77	6.7	3.4	5.3	2.68	**3.6**	**1.8**
Chromium	2.7	0.77	1.5	1.5	1.6	1.55	0.6	0.6
Cobalt	NVA							
Copper	47.0	0.77	17.6	9.5	1348.1	135.36	**28.7**	**2.9**
Lead	1.1	0.77	93.5	33.7	121.2	39.80	**107.3**	**35.2**
Manganese	997.0	0.77	4.1	3.5	8.5	6.96	0.0	0.0
Nickel	77.4	0.77	45.4	11.1	38.7	9.48	0.5	0.1
Silver	2.2	0.77	0.6	0.3	0.4	0.24	0.2	0.1
Selenium	0.5	0.77	0.4	0.3	0.4	0.29	0.7	0.6
Thallium	NVA							
Vanadium	11.4	0.77	0.3	0.2	0.8	0.56	0.1	0.0
Zinc	14.5	0.77	167.8	128.3	158.3	111.70	**10.9**	**7.7**
PCB	0.2	0.77	0.8	0.3	0.6	0.28	**3.5**	**1.5**
TCDD TEQ	1.4E-05	0.77	0.0	0.0	0.0	0.00	0.5	0.2
Benzo(a)anthracene	40.0	0.77	0.3	0.1	0.3	0.10	0.0	0.0
Benzo(a)pyrene	40.0	0.77	0.2	0.1	0.1	0.07	0.0	0.0
Benzo(b)fluoranthene	40.0	0.77	0.4	0.1	0.3	0.12	0.0	0.0
Benzo(g,h,i)perylene	40.0	0.77	0.1	0.1	0.1	0.06	0.0	0.0
Benzo(k)fluoranthene	40.0	0.77	0.1	0.1	0.1	0.07	0.0	0.0
Chrysene	40.0	0.77	0.2	0.1	0.2	0.08	0.0	0.0
Indeno(1,2,3-cd) pyrene	40.0	0.77	0.1	0.1	0.1	0.06	0.0	0.0
Pyrene	40.0	0.77	0.4	0.2	0.4	0.14	0.0	0.0
Bis(2-Ethylhexyl)phthalate	1.1	0.77	0.0	0.0	0.0	0.02	0.0	0.0
Butyl benzylphthalate	0.1	0.77	0.6	0.1	0.6	0.08	**5.2**	0.7
Di-n-butylphthalate	0.1	0.77	0.0	0.0	0.0	0.01	0.3	0.1
Di-n-octyl phthalate	0.1	0.77	0.1	0.0	0.1	0.02	0.7	0.2

Note:
SQ > 1.5 are bolded
NVA = No Value Available
mg/kg = miligram per kilogram
UCL = Upper Confidence Limit

TABLE 4.12

ASSESSMENT OF RISK TO CONSUMERS OF ADULT AQUATIC INSECTS: BORWN BAT AND TREE SWALLOW
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	Toxicity Reference Value (mg/kg/day)	Feeding Rate (mg/kg/day)	95% UCL Predicted Conc. in Biota	Mean Predicted Conc. in Biota	95% UCL Dose, (mg/kg/day)	Mean Dose (mg/kg/day)	95% UCL SQ	Mean SQ
	Brown Bat							
Total Chlordane	4.60	0.33	3.0E-02	2.0E-02	0.01	0.01	0.0	0.0
Dieldrin	0.02	0.33	1.7E-02	1.1E-02	0.01	0.00	0.3	0.2
Total Endrin	0.09	0.33	8.3E-02	5.5E-02	0.03	0.02	0.3	0.2
PCB	0.32	0.33	0.73	0.39	0.24	0.13	0.7	0.4
Benzo(a)anthracene	1.00	0.33	0.44	0.29	0.14	0.10	0.1	0.1
Benzo(a)pyrene	1.00	0.33	0.52	0.33	0.17	0.11	0.2	0.1
Benzo(b)fluoranthene	1.00	0.33	0.73	0.48	0.24	0.16	0.2	0.2
Benzo(g,h,i)perylene	1.00	0.33	0.58	0.36	0.19	0.12	0.2	0.1
Benzo(k)fluoranthene	1.00	0.33	0.28	0.18	0.09	0.06	0.1	0.1
Chrysene	1.00	0.33	0.44	0.30	0.14	0.10	0.1	0.1
Dibenz(a,h)anthracene	1.00	0.33	0.14	0.09	0.05	0.03	0.0	0.0
Fluoranthene	13.20	0.33	0.75	0.54	0.25	0.18	0.0	0.0
Indeno(1,2,3-cd) pyrene	1.00	0.33	0.55	0.34	0.18	0.11	0.2	0.1
Pyrene	75.00	0.33	0.87	0.62	0.29	0.21	0.0	0.0
Bis(2-Ethylhexyl)phthalate	18.30	0.33	0.14	0.13	0.04	0.04	0.0	0.0
	Tree Swallow							
Total Chlordane	2.14	0.76	0.03	0.02	0.02	0.01	0.0	0.0
Dieldrin	0.08	0.76	0.02	0.01	0.01	0.01	0.2	0.1
Total Endrin	0.05	0.76	0.08	0.05	0.06	0.04	1.2	0.8
PCB	0.18	0.76	0.73	0.39	0.55	0.29	**3.0**	**1.6**
Benzo(a)anthracene	40.0	0.76	0.44	0.29	0.33	0.22	0.0	0.0
Benzo(a)pyrene	40.0	0.76	0.52	0.33	0.39	0.25	0.0	0.0
Benzo(b)fluoranthene	40.0	0.76	0.73	0.48	0.55	0.36	0.0	0.0
Benzo(g,h,i)perylene	40.0	0.76	0.58	0.36	0.44	0.27	0.0	0.0
Benzo(k)fluoranthene	40.0	0.76	0.28	0.18	0.21	0.14	0.0	0.0
Chrysene	40.0	0.76	0.44	0.30	0.33	0.22	0.0	0.0
Dibenz(a,h)anthracene	40.0	0.76	0.14	0.09	0.11	0.07	0.0	0.0
Fluoranthene	40.0	0.76	0.75	0.54	0.57	0.41	0.0	0.0
Indeno(1,2,3-cd) pyrene	40.0	0.76	0.55	0.34	0.42	0.26	0.0	0.0
Pyrene	40.0	0.76	0.87	0.62	0.66	0.47	0.0	0.0
Bis(2-Ethylhexyl)phthalate	1.10	0.76	0.14	0.13	0.10	0.10	0.1	0.1

Note:
SQ > 1.5 are bolded

TABLE 4.13

ASSESSMENT OF RISK TO CONSUMERS TOP PREDATORS: FOX AND RED-TAILED HAWK
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	Toxicity Ref. Value (mg/kg/day)	Feeding Rate (mg/kg/day)	95% UCL Predicted Conc. in Biota	Mean Conc. Predicted In Biota	95% UCL Dose, (mg/kg/day)	Mean Dose (mg/kg/day)	95% UCL SQ	Mean SQ
	Fox							
Antimony	0.13	0.10	0.06	0.02	0.04	0.02	0.3	0.1
Arsenic	0.1	0.10	0.05	0.03	0.06	0.03	0.4	0.2
Barium	5.1	0.10	28.75	6.58	9.48	1.46	1.9	0.3
Cadmium	1.0	0.10	0.44	0.29	0.05	0.03	0.1	0.0
Chromium	2740.0	0.10	0.78	0.64	0.11	0.09	0.0	0.0
Cobalt	2.0	0.10	0.06	0.05	0.02	0.01	0.0	0.0
Copper	11.7	0.10	10.09	7.19	96.33	9.87	8.2	0.8
Lead	8.0	0.10	9.98	5.70	4.51	1.56	0.6	0.2
Manganese	88.0	0.10	1.97	1.56	0.58	0.46	0.0	0.0
Nickel	40.0	0.10	2.64	1.37	0.53	0.20	0.0	0.0
Silver	6.4	0.10	0.00	0.00	0.00	0.00	0.0	0.0
Selenium	0.2	0.10	0.28	0.25	0.03	0.03	0.2	0.1
Thallium	0.0	0.10	0.03	0.02	0.00	0.00	0.7	0.5
Vanadium	0.2	0.10	0.27	0.20	0.07	0.05	0.3	0.2
Zinc	160.0	0.10	38.43	36.18	5.92	4.54	0.0	0.0
PCB	0.3	0.10	0.12	0.06	0.01	0.01	0.0	0.0
TCDD TEQ	0.0	0.10	0.00	0.00	0.00	0.00	0.3	0.1
Benzo(a)anthracene	1.0	0.10	0.03	0.01	0.01	0.00	0.0	0.0
Benzo(a)pyrene	1.0	0.10	0.02	0.01	0.00	0.00	0.0	0.0
Benzo(b)fluoranthene	1.0	0.10	0.04	0.01	0.01	0.00	0.0	0.0
Benzo(k)fluoranthene	1.0	0.10	0.01	0.01	0.00	0.00	0.0	0.0
Chrysene	1.0	0.10	0.02	0.01	0.00	0.00	0.0	0.0
Indeno(1,2,3-cd) pyrene	1.0	0.10	0.01	0.01	0.00	0.00	0.0	0.0
Pyrene	75.0	0.10	0.04	0.02	0.01	0.00	0.0	0.0
Bis(2-Ethylhexyl)phthalate	18.3	0.10	0.00	0.00	0.00	0.00	0.0	0.0
Butyl benzylphthalate	159.0	0.10	0.06	0.01	0.01	0.00	0.0	0.0
Di-n-butylphthalate	550.0	0.10	0.00	0.00	0.00	0.00	0.0	0.0

TABLE 4.13

ASSESSMENT OF RISK TO CONSUMERS TOP PREDATORS: FOX AND RED-TAILED HAWK
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	Toxicity Ref. Value (mg/kg/day)	Feeding Rate (mg/kg/day)	95% UCL Predicted Conc. in Biota	Mean Conc. Predicted In Biota	95% UCL Dose, (mg/kg/day)	Mean Dose (mg/kg/day)	95% UCL SQ	Mean SQ
	Red-tailed Hawk							
Antimony	0.13	0.1	0.1	0.0	0.04	0.02	0.4	0.2
Arsenic	5.1	0.1	0.0	0.0	0.06	0.00	0.0	0.0
Barium	20.8	0.1	28.7	6.6	9.48	0.66	0.5	0.0
Cadmium	1.5	0.1	0.4	0.3	0.05	0.03	0.0	0.0
Chromium	2.7	0.1	0.8	0.6	0.11	0.06	0.0	0.0
Cobalt	NVA							
Copper	47.0	0.1	10.1	7.2	96.33	0.72	**2.1**	0.0
Lead	1.1	0.1	10.0	5.7	4.51	0.57	**4.0**	0.5
Manganese	997.0	0.1	2.0	1.6	0.58	0.16	0.0	0.0
Nickel	77.4	0.1	2.6	1.4	0.53	0.14	0.0	0.0
Silver	2.2	0.1	0.0	0.0	0.00	0.00	0.0	0.0
Selenium	0.5	0.1	0.3	0.2	0.03	0.02	0.1	0.0
Thallium	NVA							
Vanadium	11.4	0.1	0.3	0.2	0.07	0.02	0.0	0.0
Zinc	14.5	0.1	38.4	36.2	5.92	3.62	0.4	0.2
PCB	0.2	0.1	0.1	0.1	0.01	0.01	0.1	0.0
TCDD TEQ	1.4E-05	0.1	0.0	0.0	0.00	0.00	0.0	0.0
Benzo(a)anthracene	40.0	0.1	0.0	0.0	0.01	0.00	0.0	0.0
Benzo(a)pyrene	40.0	0.1	0.0	0.0	0.00	0.00	0.0	0.0
Benzo(b)fluoranthene	40.0	0.1	0.0	0.0	0.01	0.00	0.0	0.0
Benzo(g,h,i)perylene	40.0	0.1	0.0	0.0	0.00	0.00	0.0	0.0
Benzo(k)fluoranthene	40.0	0.1	0.0	0.0	0.00	0.00	0.0	0.0
Chrysene	40.0	0.1	0.0	0.0	0.00	0.00	0.0	0.0
Indeno(1,2,3-cd) pyrene	40.0	0.1	0.0	0.0	0.00	0.00	0.0	0.0
Pyrene	40.0	0.1	0.0	0.0	0.01	0.00	0.0	0.0
Bis(2-Ethylhexyl)phthalate	1.1	0.1	0.0	0.0	0.00	0.00	0.0	0.0
Butyl benzylphthalate	0.1	0.1	0.1	0.0	0.01	0.00	0.1	0.0
Di-n-butylphthalate	0.1	0.1	0.0	0.0	0.00	0.00	0.0	0.0

Note:
SQ > 1.5 are bolded
NVA = No Value Available

TABLE 4.14

ASSESSMENT OF RISK TO PISCIVOROUS WILDLIFE: MINK AND GREAT BLUE HERON
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	Toxicity Reference Value, (mg/kg/day)	Feeding Rate, (mg/kg/day)	95% UCL Predicted Conc. in Biota	Mean Conc. Pedicted in Fish	95% UCL Dose, (mg/kg/day)	Mean. Dose, (mg/kg/day)	95% UCL SQ	Mean SQ
	Mink							
Total Chlordane	4.60	0.16	0.09	0.06	0.014	0.009	0.0	0.0
Dieldrin	0.02	0.16	0.05	0.03	0.008	0.005	0.4	0.3
Total Endrin	0.09	0.16	0.25	0.16	0.039	0.026	0.4	0.3
PCBs	0.32	0.16	2.18	1.17	0.341	0.183	1.1	0.6
	Great Blue Heron							
Total Chlordane	2.14	0.18	0.09	0.06	0.016	0.010	0.0	0.0
Dieldrin	0.08	0.18	0.05	0.03	0.009	0.006	0.1	0.1
Total Endrin	0.05	0.18	0.25	0.16	0.044	0.029	0.8	0.5
PCBs	0.18	0.18	2.18	1.17	0.39	0.21	**2.2**	1.2

Note:
SQ > 1.5 are bolded

TABLE 4.15

SEDIMENT CONCENTRATIONS VERSES PEC SCREENING VALUE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

			Location/depth (Bolded conc. are > PEC)	
			S15(Ohio EPA)	*S16(OhioEPA)*
		PEC	*15-18 ft Deep*	*15-18 ft Deep*
Semi-Volatiles				
2-Methylnaphthalene	ug/kg		120 J	75 J
Acenaphthene	ug/kg		59 J	92 J
Acenaphthylene	ug/kg		850 U	61 J
Anthracene	ug/kg	845	110 J	230 J
Benzo(a)anthracene	ug/kg	1050	490 J	**1500**
Benzo(a)pyrene	ug/kg	1450	460 J	**1800**
Benzo(b)fluoranthene	ug/kg		800 J	2500
Benzo(g,h,i)perylene	ug/kg		490 J	2000
Benzo(k)fluoranthene	ug/kg		300 J	950
Chrysene	ug/kg	1290	550 J	**1500**
Dibenz(a,h)anthracene	ug/kg		120 J	480 J
Fluoranthene	ug/kg	2230	1100	**2600**
Fluorene	ug/kg	536	76 J	160 J
Indeno(1,2,3-cd)pyrene	ug/kg		460 J	1900
Naphthalene	ug/kg	561	70 J	77 J
Phenanthrene	ug/kg	1170	890	**1500**
Pyrene	ug/kg	1520	1300	**3000**
Total PAH		22800	#NAME?	#NAME?
Aroclor-1254 (PCB-1254)	ug/kg	676	660	94 U
Pesticides				
alpha-Chlordane	ug/kg	18	12	1.8 JP
Dieldrin	ug/kg	62	9.6 P	2.6 JP
Endrin	ug/kg	207	34	9.4 U
Endrin aldehyde	ug/kg	207	7.9 JP	9.4 U
Endrin ketone	ug/kg	207	8.7 U	4.9 J
gamma-Chlordane	ug/kg	18	4.9 P	3.2 J
Total Chlordane	ug/kg	18	16.90	5.00
Total Endrin	ug/kg	207	#NAME?	#NAME?

Notes:

PEC: MacDonald, D.D., C.G. Ingersoll, and T.A. Berger, 2000. Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems, Arch. Environ. Contam. Toxicol. 39, 20-31.

PEC = Probable Effects Concentrations

TABLE 4.16

REASSESSMENT OF RISK TO CONSUMERS OF SOIL INVERTEBRATES USING MATC: SHREW AND WOODCOCK
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	Toxicity Reference Value [1] (mg/kg/day)	Feeding Rate (mg/kg/day)	95% UCL Predicted Conc. in Biota	Mean Predicted Conc. In Biota	95% UCL Dose, (mg/kg/day)	Mean Dose (mg/kg/day)	95% UCL SQ	Mean SQ
	Shrew							
Antimony	0.40	0.53	3.75	1.62	2.5	1.09	**6.4**	**2.8**
Arsenic	0.40	0.53	0.62	0.38	1.0	0.56	**2.6**	1.4
Barium	10.05	0.53	52.84	6.43	120.5	14.65	**12.0**	**1.5**
Cadmium	3.16	0.53	6.73	3.42	3.7	1.86	1.2	0.6
Copper	13.42	0.53	17.62	9.49	1343.9	133.09	**100.1**	**9.9**
Lead	25.30	0.53	93.53	33.67	98.8	31.72	**3.9**	1.3
Thallium	0.02	0.53	0.03	0.02	0.0	0.03	**1.8**	1.3
Vanadium	0.66	0.53	0.27	0.20	0.7	0.52	1.0	0.8
2,3,7,8-TCDD TEQ	3.16E-06	0.53	0.00	0.00	0.0	0.00	1.4	0.6
	Woodcock							
Antimony	NVA							
Barium	29.45	0.77	52.8	6.4	133.1	16.20	**4.5**	0.5
Cadmium	5.39	0.77	6.7	3.4	5.3	2.68	1.0	0.5
Copper	53.85	0.77	17.6	9.5	1348.1	135.36	**25.0**	**2.5**
Lead	3.57	0.77	93.5	33.7	121.2	39.80	**33.9**	**11.1**
Zinc	43.58	0.77	167.8	128.3	158.3	111.70	**3.6**	**2.6**
PCB	0.57	0.77	0.8	0.3	0.6	0.28	1.1	0.5
Butyl benzylphthalate	0.35	0.77	0.6	0.1	0.6	0.08	**1.6**	0.2

Notes:
(1) MATC is the geometric mean of the NOAEL and LOAEL.
SQ > 1.5 are bolded
UCL = Upper Confidence Limit

TABLE 4.17

REASSESSMENT OF RISK TO CONSUMERS OF SOIL INVERTEBRATES USING LOAEL: SHREW AND WOODCOCK
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Constituent	Toxicity Reference Value (mg/kg/day)	Feeding Rate (mg/kg/day)	95% UCL Predicted Conc. in Biota	Mean Predicted Conc. In Biota	95% UCL Dose, (mg/kg/day)	Mean Dose (mg/kg/day)	95% UCL SQ	Mean SQ
	Shrew							
Antimony	1.25	0.53	3.75	1.62	2.5	1.09	**2.0**	0.9
Arsenic	1.26	0.53	0.62	0.38	1.0	0.56	0.8	0.4
Barium	19.80	0.53	52.84	6.43	120.5	14.65	**6.1**	0.7
Cadmium	10.00	0.53	6.73	3.42	3.7	1.86	0.4	0.2
Copper	15.40	0.53	17.62	9.49	1343.9	133.09	**87.3**	**8.6**
Lead	80.00	0.53	93.53	33.67	98.8	31.72	1.2	0.4
Thallium	0.07	0.53	0.03	0.02	0.0	0.03	0.6	0.4
Vanadium	2.10	0.53	0.27	0.20	0.7	0.52	0.3	0.2
2,3,7,8-TCDD TEQ	1.00E-05	0.53	0.00	0.00	0.0	0.00	0.5	0.2
	Woodcock							
Antimony	NVA							
Barium	41.70	0.77	52.8	6.4	133.1	16.20	**3.2**	0.4
Cadmium	20.00	0.77	6.7	3.4	5.3	2.68	0.3	0.1
Copper	61.70	0.77	17.6	9.5	1348.1	135.36	**21.8**	**2.2**
Lead	11.30	0.77	93.5	33.7	121.2	39.80	**10.7**	**3.5**
Zinc	131.00	0.77	167.8	128.3	158.3	111.70	1.2	0.9
PCB	1.80	0.77	0.8	0.3	0.6	0.28	0.4	0.2
Butyl benzylphthalate	1.1	0.77	0.6	0.1	0.6	0.08	0.5	0.1

Note:
SQ > 1.5 are bolded
mg/kg= miligram per kilogram

TABLE 4.18

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN (COPEC) IN OFF-SITE SEDIMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Off-Site Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level	Toxicity Screening Level Source (4)	SQ (5)	COPEC Flag	Rationale for Contaminant Deletion or Selection (6)
	VOCs														
78-93-3	2-Butanone (MEK)	5	J	5	J	µg/kg	S18; 0-0.5 ft bgs (07/09/96)	1/3	14 - 18	5	42	Region V	0.1		SQ<1.5
67-64-1	Acetone	19		33		µg/kg	S18; 0-0.5 ft bgs (07/09/96)	2/3	14 - 15	33	10	Region V	3.3	X	SQ>1.5
108-88-3	Toluene	1	J	1	J	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	1/3	14 - 18	1	1,220	Region V	0.0		SQ<1.5
79-01-6	Trichloroethene	0.7	J	0.7	J	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	1/3	14 - 18	0.7	112	Region V	0.0		SQ<1.5
	SVOCs														
91-57-6	2-Methylnaphthalene	16	J	31	J	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	31	4,460	EPA 2003	0.0		SQ<1.5
83-32-9	Acenaphthene	15	J	89	J	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	89	4,910	EPA 2003	0.0		SQ<1.5
208-96-8	Acenaphthylene	14	J	160	J	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	160	4,520	EPA 2003	0.0		SQ<1.5
120-12-7	Anthracene	75	J	400	J	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	400	5,940	EPA 2003	0.1		SQ<1.5
56-55-3	Benzo(a)anthracene	600		2200		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	2200	8,410	EPA 2003	0.3		SQ<1.5
50-32-8	Benzo(a)pyrene	580		2100		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	2100	8,410	EPA 2003	0.2		SQ<1.5
205-99-2	Benzo(b)fluoranthene	1000		2700		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	2700	9,790	EPA 2003	0.3		SQ<1.5
191-24-2	Benzo(g,h,i)perylene	660		2200		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	2200	10,950	EPA 2003	0.2		SQ<1.5
207-08-9	Benzo(k)fluoranthene	410	J	930		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	930	9,810	EPA 2003	0.1		SQ<1.5
117-81-7	bis(2-Ethylhexyl)phthalate	84	J	360	J	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	14-May	360	182	Region V	2.0	X	SQ>1.5
85-68-7	Butyl benzylphthalate	84	J	84	J	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	1/3	460 - 580	84	1,970	Region V	0.0		SQ<1.5
86-74-8	Carbazole	15	J	190	J	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	190	NVA	Region V			NSV
218-01-9	Chrysene	710		2500		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	2500	8,440	EPA 2003	0.3		SQ<1.5
53-70-3	Dibenz(a,h)anthracene	150	J	430	J	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	430	12,210	EPA 2003	0.0		SQ<1.5
132-64-9	Dibenzofuran	7	J	100	J	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	100	449	Region V	0.2		SQ<1.5
84-66-2	Diethylphthalate	24	J	51	J	µg/kg	S18; 0-0.5 ftbgs (07/09/96)	3/3	--	51	295	Region V	0.2		SQ<1.5
206-44-0	Fluoranthene	1400		2200		µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	2200	7,070	EPA 2003	0.3		SQ<1.5
86-73-7	Fluorene	43	J	130	J	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	130	5,380	EPA 2003	0.0		SQ<1.5
193-39-5	Indeno(1,2,3-cd) pyrene	650		1900		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	1900	11,150	EPA 2003	0.2		SQ<1.5
91-20-3	Naphthalene	18	J	63	J	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	63	3,850	EPA 2003	0.0		SQ<1.5
85-01-8	Phenanthrene	610		1900		µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	1900	5,960	EPA 2003	0.3		SQ<1.5
129-00-0	Pyrene	1400		4700	E	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	4700	6,970	EPA 2003	0.7		SQ<1.5
	Total PAH ESB												3.1	X	SQ>1.5
	Total PAH ESB * 2.3												7.0	X	SQ>1.5

TABLE 4.18

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN (COPEC) IN OFF-SITE SEDIMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Off-Site Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level	Toxicity Screening Level Source (4)	SQ (5)	COPEC Flag	Rationale for (6) Contaminant Deletion or Selection
	Metals														
7429-90-5	Aluminum	8450000		9750000		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	9,750,000	-	-	-		NSV
7440-38-2	Arsenic	6000		9200		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	9,200	9,790	Region V	0.9		SQ<1.5
7440-39-3	Barium	117000		130000		µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	130,000	300,000	Dutch	0.4		SQ<1.5
7440-41-7	Beryllium	470	B	540	B	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	540	1,200	Dutch	0.5		SQ<1.5
7440-70-2	Calcium	58100000		81900000		µg/kg	S18; 0-0.5 ft bgs (07/09/96)	3/3	--	81,900,000	-	-	-		NUT
7440-47-3	Chromium	13700		22300		µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	22,300	43,400	Region V	0.5		SQ<1.5
7440-48-4	Cobalt	6200	B	7200	B	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	7,200	50,000	Region V	0.1		SQ<1.5
7440-50-8	Copper	26000		33500		µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	33,500	31,600	Region V	1.1		SQ<1.5
57-12-5	Cyanide	190	B	320	B	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	320	0.1	Region V	3200.0	X	SQ>1.5
7439-89-6	Iron	15000000		16400000		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	16,400,000	-	-	-		NSV
7439-92-1	Lead	30500		51600		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	51,600	35,800	Region V	1.4		SQ<1.5
7439-95-4	Magnesium	16100000		24200000		µg/kg	S18; 0-0.5 ft bgs (07/09/96)	3/3	--	24,200,000	-	-	-		NUT
7439-96-5	Manganese	258000		420000		µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	420,000	630,000	SQRT	0.7		SQ<1.5
7439-97-6	Mercury	130	B	650		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	2/3	90	650	-	-	-		NSV
7440-02-0	Nickel	16200		23700		µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	23,700	22,700	Region V	1.0		SQ<1.5
7440-09-7	Potassium	709000	B	1090000	B	µg/kg	S18; 0-0.5 ft bgs (07/09/96)	3/3	--	1,090,000	-	-	-		NUT
7782-49-2	Selenium	400	B	730	B	µg/kg	S18; 0-0.5 ft bgs (07/09/96)	3/3	--	730	2,900	Dutch	0.3		SQ<1.5
7740-23-5	Sodium	131000	B	191000	B	µg/kg	S18; 0-0.5 ft bgs (07/09/96)	3/3	--	191,000	-	-	-		NUT
7440-28-0	Thallium	660	B	1000	B	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	1,000	2,600	Dutch	0.4		SQ<1.5
7440-62-2	Vanadium	19200		21800		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	21,800	56,000	Dutch	0.4		SQ<1.5
7440-66-6	Zinc	80400		132000		µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	--	132,000	121,000	Region V	1.1		SQ<1.5
	Pesticides														
72-54-8	4,4'-DDD	2.2	JP	4.9		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	4.9	5	Region V	1.0		SQ<1.5
72-55-9	4,4'-DDE	2.4	JP	2.6	JP	µg/kg	S18; 0-0.5 ft bgs (07/09/96)	2/3	4.6 - 5	2.6	3	Region V	0.8		SQ<1.5
50-29-3	4,4'-DDT	2.1	JP	2.7	JP	µg/kg	S18; 0-0.5 ft bgs (07/09/96)	3/3	--	2.7	4	Region V	0.6		SQ<1.5
309-00-2	Aldrin	1.3	JP	1.3	JP	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	1/3	2.4 - 3	1.3	-	-	-		NSV
5103-71-9	alpha-Chlordane	0.72	JP	7	P	µg/kg	S18; 0-0.5 ft bgs (07/09/96)	3/3	2.4	7	3	Region V	2.2	X	SQ>1.5
608-73-1	delta-BHC	1.4	JP	1.5	JP	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	1/3	3 - 3.1	1.5	-	-	-		NSV
60-57-1	Dieldrin	0.86	JP	4	JP	µg/kg	S19; 0-0.5 ft bgs (07/09/96)	3/3	4.6	4	2	Region V	2.1	X	SQ>1.5
1031-07-8	Endosulfan sulfate	3	JP	3	JP	µg/kg	S18; 0-0.5 ft bgs (07/09/96)	1/3	4.6 - 6	3	35	Region V	0.1		SQ<1.5
72-20-8	Endrin	2.4	JP	4.8	P	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	2/3	6	4.8	2	Region V	2.2	X	SQ>1.5
53494-70-5	Endrin ketone	2.5	JP	4	JP	µg/kg	S17; 0-0.5 ft bgs (07/09/96)	2/3	5.8	4	0	-	-		

TABLE 4.18

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CONTAMINANTS OF POTENTIAL ECOLOGICAL CONCERN (COPEC) IN OFF-SITE SEDIMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Off-Site Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level	Toxicity Screening Level Source (4)	SQ (5)	COPEC Flag	Rationale for Contaminant Deletion or Selection (6)
	Pesticides (cont.'d)														
5103-74-2	gamma-Chlordane	1.4	J	6.9		µg/kg	S18; 0-0.5 ft bgs (07/09/96)	3/3	2.4	6.9	3	Region V	2.1	X	SQ>1.5
72-43-5	Methoxychlor	8.9	JP	65		µg/kg	S17; 0-0.5 ft bgs (07/09/96)	3/3	--	65	14	Region V	4.8	X	SQ>1.5

Notes:

(1) Minimum/maximum detected concentration.
(2) Based on data collected from sampling locations: S17, S18, S19.
(3) Maximum concentration is used for screening.
(4) Toxicity Screening Level Sources:
metals, taking into account background. Report #601501.001, National Institute of Public Health and the Environment, Bilthoven, The Netherlands.
organisms: PAH mixtures. EPA-600-R-02-013.
Region V: USEPA Region V, 2003. Ecological Data Quality Levels, August 22, 2003.
SQRT: NOAA, 1999. Screening quick reference tables (SQRT). Hazmat Report 99-1. National Oceanic and Atmospheric Administration, Washington, DC.
(5) SQ (Screening Value) = Maximum detected / Screening Level
(6) Rationale Codes
Selection Reason : Maximum detected greater than SQ (SQ>1.5)
Deletion Reason : Maximum detected less than SQ (SQ<1.5)
Essential Nutrient (NUT)
No screening value (NSV)

Definitions:

-- = Not Available
N/A = Not Applicable
J = Estimated.
E = Exceed calibration range of GC/MS instrument
B = Method blank contamination.
P = Difference for detected Aroclor > 25% between 2 GC column.
µg/kg = microgram per liter
ft bgs = feet below ground surface
ng/kg = nanogram per kilogram
VOCs - Volatile Organic Compounds

APPENDIX A

ANALYTICAL DATABASE

TABLE A1.1

HISTORIC SOIL SAMPLING ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S1(EPA)*	*S2(EPA)*	*S3(EPA)*	*S4(EPA)*	*S5(EPA)*	*S6(EPA)*	*S7(EPA)*	*S8(EPA)*	*S9(EPA)*	*S10(EPA)*	*S11(EPA)*	*S01(OEPA)*	*S02(OEPA)*	*S03(OEPA)*	*S03(OEPA)*	*S04(OEPA)*	*S05(OEPA)*	*S06(OEPA)*	*S07(OEPA)*	*S08(OEPA)*	*S09(OEPA)*	*S10(OEPA)*	*S11(OEPA)*
Sample ID:			*S1*	*S2*	*S3*	*S4*	*S5*	*S6*	*S7*	*S8*	*S9*	*S10*	*S11*	*96-DV-03-S01*	*96-DV-03-S02*	*96-DV-03-S03*	*96-DV-03-D03*	*96-DV-03-S04*	*96-DV-03-S05*	*96-DV-03-S06*	*96-DV-03-S07*	*96-DV-03-S08*	*96-DV-03-S09*	*96-DV-03-S10*	*96-DV-03-S11*
Sample Date:			*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*
Sample Depth:			*1-2 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*1-2 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*4-4.5 ft BGS*	*0-0.1 ft BGS*	*1.5-2 ft BGS*	*1.5-2 ft BGS Duplicate*	*1.5-2 ft BGS*	*-5 ft BGS*	*1.5-2.5 ft BGS*	*0-0.2 ft BGS*	*0.2-0.3 ft BGS*	*0.3-0.5 ft BGS*	*0-0.3 ft BGS*	*0.2-0.3 ft BGS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*																							
Volatiles																									
1,1,1-Trichloroethane	8700	38000	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
1,1,2,2-Tetrachloroethane	0.56	2.8	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
1,1,2-Trichloroethane	1.1	5.3	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
1,1-Dichloroethane	3.3	17	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
1,1-Dichloroethene	240	1100	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
1,2-Dichloroethane	0.43	2.2	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
1,2-Dichloroethene (total)	700	9200	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.2	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
1,2-Dichloropropane	0.89	4.5	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
2-Butanone (Methyl ethyl ketone) (MEK)	28000	200000	0.002 J	0.01 U	0.01 U	0.01 U	0.001 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
2-Hexanone	210	1400	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	5300	53000	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.036 J	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Acetone	61000	630000	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.025 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.012 U	0.003 J	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Benzene	1.1	5.4	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Bromodichloromethane	0.27	1.4	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Bromoform	61	220	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Bromomethane (Methyl bromide)	7.3	32	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Carbon disulfide	820	3700	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Carbon tetrachloride	0.25	1.2	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Chlorobenzene	290	1400	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Chloroethane	15000	61000	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Chloroform (Trichloromethane)	0.29	1.5	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Chloromethane (Methyl chloride)	120	500	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Dibromochloromethane	0.68	3.3	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
[illegible]rbenzene	5.4	27	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
[illegible]ylene chloride	11	53	-	-	-	-	-	-	-	-	-	-	-	0.012 JBU	0.016 BU	0.012 JBU	0.012 JBU	0.016 JBU	0.012 JBU	0.016 JBU	0.011 JBU	0.016	0.011 JBU	0.012 JBU	0.017 BU
[illegible]yrene	6300	36000	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Tetrachloroethene	0.55	2.6	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.011	0.005 U	0.005 U	0.005 U	0.059	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Toluene	5000	45000	0.003 J	0.005 U	0.005 U	0.005 U	0.007	0.009 J	0.004 J	0.002 J	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.007 J	0.005 J	0.016 U	0.012 U	0.016 U	0.011 U	0.01 J	0.011 U	0.004 J	0.007 J
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Trichloroethene	2.8	14	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.004 J	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Vinyl chloride	0.06	1.7	-	-	-	-	-	-	-	-	-	-	-	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Xylene (total)	630	2700	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.003 J	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.012 U	0.01 U	0.012 U	0.012 U	0.016 U	0.012 U	0.016 U	0.011 U	0.011 U	0.011 U	0.012 U	0.011 U
Semi-Volatile																									
1,2,4-Trichlorobenzene	22	99	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
1,2-Dichlorobenzene	1900	9800	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
1,4-Dichlorobenzene	2.4	12	-	-	-	-	-	-	-	-	-	-	-	0.14 J	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
2,4,5-Trichlorophenol	6100	62000	-	-	-	-	-	-	-	-	-	-	-	1 U	0.86 U	1 U	1 U	1.3 U	0.96 U	1.3 U	0.94 U	0.92 U	0.88 U	1 U	0.9 U
2,4,6-Trichlorophenol	44	160	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
2,4-Dichlorophenol	180	1800	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
2,4-Dimethylphenol	1200	12000	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
2,4-Dinitrophenol	120	1200	-	-	-	-	-	-	-	-	-	-	-	1 U	0.86 U	1 U	1 U	1.3 U	0.96 U	1.3 U	0.94 U	0.92 U	0.88 U	1 U	0.9 U
2,4-Dinitrotoluene	1.6	5.5	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
2,6-Dinitrotoluene	61	620	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
2-Chloronaphthalene	6300	82000	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
2-Chlorophenol	390	5100	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
2-Methylnaphthalene	310	4100	1.8	0.25 J	0.5 J	0.33 U	0.95	0.13 J	0.75 J	0.19 J	0.33 U	0.33 U	0.24 J	0.41 U	0.34 U	0.41 U	0.41 U	0.077 J	0.38 U	0.53 U	0.38 U	0.39	0.049 J	0.046 J	0.074 J
2-Methylphenol	3100	31000	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
2-Nitroaniline	610	6000	-	-	-	-	-	-	-	-	-	-	-	1 U	0.86 U	1 U	1 U	1.3 U	0.96 U	1.3 U	0.94 U	0.92 U	0.88 U	1 U	0.9 U
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	1 U	0.86 U	1 U	1 U	1.3 U	0.96 U	1.3 U	0.94 U	0.92 U	0.88 U	1 U	0.9 U
4,6-Dinitro-2-methylphenol	6.1	62	-	-	-	-	-	-	-	-	-	-	-	1 U	0.86 U	1 U	1 U	1.3 U	0.96 U	1.3 U	0.94 U	0.92 U	0.88 U	1 U	0.9 U
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
4-Chloro-3-methylphenol	6100	62000	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
4-Chloroaniline	2.4	8.6	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
4-Methylphenol	310	3100	-	-	-	-	-	-	-	-	-	-	-	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
4-Nitroaniline	24	86	-	-	-	-	-	-	-	-	-	-	-	1 U	0.86 U	1 U	1 U	1.3 U	0.96 U	1.3 U	0.94 U	0.92 U	0.88 U	1 U	0.9 U

TABLE A1.1

HISTORIC SOIL SAMPLING ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			S1(EPA)	S2(EPA)	S3(EPA)	S4(EPA)	S5(EPA)	S6(EPA)	S7(EPA)	S8(EPA)	S9(EPA)	S10(EPA)	S11(EPA)
Sample ID:			S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
Sample Date:			10/23/1990	10/23/1990	10/23/1990	10/23/1990	10/23/1990	10/23/1990	10/23/1990	10/23/1990	10/23/1990	10/23/1990	10/23/1990
Sample Depth:			1-2 ft BGS	0-1 ft BGS	0-1 ft BGS	0-1 ft BGS	1-2 ft BGS	0-1 ft BGS	0-1 ft BGS	0-1 ft BGS	0-1 ft BGS	0-1 ft BGS	0-1 ft BGS
Parameter	Residential Soil Criteria a	Industrial Soil Criteria b											
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	3400	33000	0.33 U	0.33 U	0.68 J	0.33 U	0.33 U	1.2	0.095 J	0.33 U	0.33 U	0.11 J	0.33 U
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	17000	170000	0.12 J	0.33 U	2.9	0.33 U	0.33 U	3	0.3 J	0.33 U	0.33 U	0.34 J	0.33 U
Benzo(a)anthracene	0.15	2.1	0.31 J*	0.074 J	8.5**	0.33 U	0.17 J*	6.9**	1.1*	0.33 U	0.33 U	1.8*	0.43 J*
Benzo(a)pyrene	0.015	0.21	0.23 J**	0.14 J*	5.9**	0.33 U	0.15 J*	4.8**	1.1**	0.15 J*	0.33 U	1.2**	0.22 J**
Benzo(b)fluoranthene	0.15	2.1	0.23 J*	0.28 J*	9.5**	0.33 U	0.32 J*	7.8**	2.9**	0.23 J*	0.15 J	2.5**	0.63 J*
Benzo(g,h,i)perylene	-	-	0.15 J	0.35 U	4.7	0.33 U	0.25 J	3.6	0.91	0.17 J	0.33 U	0.99	0.31 J
Benzo(k)fluoranthene	1.5	21	0.43 J	0.33 U	6.4*	0.33 U	0.33 U	5.5*	0.33 U	0.3 J	0.33 U	0.4 J	0.33 U
bis(2-Chloroethoxy)methane	180	1800	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	0.21	1	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	35	120	0.33 U	0.33 U	0.36 J	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
Butyl benzylphthalate (BBP)	260	910	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.95	0.33 U	0.33 U	0.096 J	0.33 U
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	15	210	0.38 J	0.15 J	5.7 J	0.33 U	0.3 J	6.4 J	1.1 J	0.18 J	0.33 U	0.33 U	0.61 J
Dibenz(a,h)anthracene	0.015	0.21	0.33 U	0.33 U	1.2*	0.33 U	0.33 U	1.6**	0.23 J**	0.33 U	0.33 U	0.11 J*	0.33 U
Dibenzofuran	78	1000	0.37 J	0.33 U	0.83 J	0.33 U	0.29 J	0.78 J	0.2 J	0.33 U	0.33 U	0.33 U	0.33 U
Diethyl phthalate	49000	490000	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	6100	62000	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.11 J	0.33 U	0.33 U	0.33 U	0.33 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	2300	22000	0.68 J	0.14 J	12	0.33 U	0.37 J	21 D	2.8	0.36 J	0.21 J	2.5	0.98 J
Fluorene	2300	22000	0.33 U	0.33 U	1.5	0.33 U	0.33 U	1.2	0.082 J	0.33 U	0.33 U	0.12 J	0.33 U
Hexachlorobenzene	0.3	1.1	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	6.2	22	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	370	3700	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	35	120	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	0.15	2.1	0.096 J	0.33 U	5**	0.33 U	0.15 J	4.1**	0.91*	0.16 J*	0.33 U	0.97*	0.27 J*
Isophorone	510	1800	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	3.6	18	1.1	0.15	0.29 J	0.33 U	0.5 J	0.26 J	0.45 J	0.33 U	0.33 U	0.33 U	0.15 J
Nitrobenzene	4.8	24	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	0.069	0.25	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	99	350	0.33 U	0.33 U	0.45 J	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U	0.33 U
Pentachlorophenol	3	9	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	0.85 J	0.2 J	16 D	0.33 U	0.98	14	1.5	0.17 J	0.21 J	1.8	0.54 J
Phenol	18000	180000	-	-	-	-	-	-	-	-	-	-	-
Pyrene	1700	17000	0.58 J	0.15 J	8.1	0.33 U	0.3 J	13	1.9	0.29 J	0.18 J	3.4	0.71 J
Metals													
Aluminum	77000	990000	5730	3800	4740	3360	1990	4620	2970	5350	11100	10600	8460
Antimony	31	410	2.4 U	2.4 U	51.4*	2.4 U	2.4 U	2.4 U	13.2 B	2.4 U	2.1 B	2.4 U	18.2 B
Arsenic	0.39	1.6	23.9**	6.8**	8.3**	12.6**	10.3**	13.1**	8.5**	11.6**	69.3**	8.1**	20.1**
Barium	15000	190000	991	23.28	157	117	81	167	130	150	190	120	265
Beryllium	160	2000	0.72 B	1 U	0.7 B	1.7	0.47 B	2	0.72 B	1.4 B	5.5	0.35 B	2.5
Cadmium	70	800	1.3	1 U	14	1 U	1 B	1 U	5.9	8.6	1 U	1 U	8.4
Calcium	-	-	33800	13300	4790	1260	1710	2650	4460	4810	10000	83700	34900
Chromium	-	-	18.5	16.9	91.7	6.3	11	8.6	20.6	43	23.2	27.6	30.4
Cobalt	23	300	3.7 B	10 U	5.6 B	8.8 B	5 B	8.2 B	5.2 B	6.2 B	22.1	4.7 B	10.9 B
Copper	3100	41000	66.8	48.9 EJ	2220 EJ	56.7 EJ	74.1 EJ	47.4 EJ	316 EJ	2200 EJ	76.6 EJ	37.6 EJ	796 EJ
Cyanide (total)	1600	20000	-	-	-	-	-	-	-	-	-	-	-
Iron	55000	720000	15900 EJ	18000	77600*	2840	4230	5630	14800	48300	11100	16300	25800
Lead	400	800	64.1	43	3300**	10.4	59.3	15.9	474*	1590**	49.7	94.8	811**
Magnesium	-	-	6270	7790	2660	294 B	439 B	537 B	2580	2230	3720	28000	15500
Manganese	1800	23000	369	344	437	7.2	55.2	27	130	272	162	446	294
Mercury	5.6	34	0.008 U	0.008 U	0.31	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.3	0.008 U	0.008 U
Nickel	1500	20000	28.9	13.9	262	13.6	17.2	17.2	94.7	402	56.6	23.1	65.5
Potassium	-	-	729 B	308 B	569 B	364 B	329 B	429 B	232 B	1030 B	1630 B	1190 B	915 B
Selenium	390	5100	2.2	1.2 BWJ	0.91 B	1.6	2.2	1.7	2.4	1.1 BWJ	4.6	2.6	3.7
Silver	390	5100	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	1.1 B	2 U
Sodium	-	-	157 B	123 B	114 B	118 B	43.7 B	81 B	64.4 B	338 B	272 B	136 B	239 B
Thallium	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 B	2 U	0.73 B
Vanadium	390	5200	18.2	7.3 B	33.9	27.9	11.5 B	28.1	16	27.4	69.6	24.3	35.5
Zinc	23000	310000	112	550	2350	9.2	57.6	14.4	2210	1490	75.1	126	480

Sample Location:	S01(OEPA)	S02(OEPA)	S03(OEPA)	S03(OEPA)	S04(OEPA)	S05(OEPA)	S06(OEPA)	S07(OEPA)	S08(OEPA)	S09(OEPA)	S10(OEPA)	S11(OEPA)
Sample ID:	96-DV-03-S01	96-DV-03-S02	96-DV-03-S03	96-DV-03-D03	96-DV-03-S04	96-DV-03-S05	96-DV-03-S06	96-DV-03-S07	96-DV-03-S08	96-DV-03-S09	96-DV-03-S10	96-DV-03-S11
Sample Date:	7/9/1996	7/9/1996	7/9/1996	7/9/1996	7/9/1996	7/9/1996	7/9/1996	7/9/1996	7/9/1996	7/9/1996	7/9/1996	7/9/1996
Sample Depth:	4-4.6 ft BGS	0-0.1 ft BGS	1.5-2 ft BGS	1.5-2 ft BGS Duplicate	1.5-2 ft BGS	-5 ft BGS	1.5-2.5 ft BGS	0-0.2 ft BGS	0.2-0.3 ft BGS	0.3-0.5 ft BGS	0-0.3 ft BGS	0.2-0.3 ft BGS
4-Nitrophenol	1 U	0.86 U	1 U	1 U	1.3 U	0.96 U	1.3 U	0.94 U	0.92 U	0.88 U	1 U	0.9 U
Acenaphthene	0.41 U	0.34 U	0.41 U	0.41 U	0.033 J	0.38 U	0.53 U	0.38 U	0.091 J	0.35 U	0.4 U	0.026 J
Acenaphthylene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.05 J
Anthracene	0.41 U	0.34 U	0.41 U	0.41 U	0.029 J	0.38 U	0.53 U	0.38 U	0.29 J	0.026 J	0.4 U	0.097 J
Benzo(a)anthracene	0.41 U	0.34 U	0.41 U	0.41 U	0.041 J	0.38 U	0.53 U	0.058 J	1.3*	0.18 J*	0.051 J	0.95*
Benzo(a)pyrene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.062 J*	0.82**	0.13 J*	0.4 U	1**
Benzo(b)fluoranthene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	1*	0.32 J*	0.079 J	1.3*
Benzo(g,h,i)perylene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.16 J	0.35 U	0.4 U	0.31 J
Benzo(k)fluoranthene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.95	0.2 J	0.073 J	0.92
bis(2-Chloroethoxy)methane	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
bis(2-Chloroethyl)ether	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
bis(2-Ethylhexyl)phthalate (DEHP)	0.024 J	0.033 J	0.41 U	0.41 U	0.54	0.38 U	0.53 U	0.032 J	0.23 J	2.1	0.072 J	0.12 J
Butyl benzylphthalate (BBP)	0.41 U	0.025 J	0.41 U	0.033 J	0.52 U	0.38 U	0.53 U	0.026 J	0.37 U	18 B	0.061 J	0.36 U
Carbazole	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 J	0.28 J	0.35 U	0.4 U	0.038 J
Chrysene	0.41 U	0.34 U	0.021 J	0.025 J	0.056 J	0.027 J	0.53 U	0.083 J	1.2	0.32 J	0.093 J	1
Dibenz(a,h)anthracene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.31 J**	0.35 U	0.4 U	0.45**
Dibenzofuran	0.41 U	0.34 U	0.41 U	0.41 U	0.028 J	0.38 U	0.53 U	0.38 U	0.16 J	0.35 U	0.4 U	0.029 J
Diethyl phthalate	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
Dimethyl phthalate	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
Di-n-butylphthalate (DBP)	0.41 U	0.018 J	0.41 U	0.027 J	0.028 J	0.38 U	0.031 J	0.028 J	0.37 U	1.5	0.035 J	0.36 U
Di-n-octyl phthalate (DnOP)	0.41 U	0.023 J	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.019 J	0.35 U	0.4 U	0.36 U
Fluoranthene	0.41 U	0.022 J	0.41 U	0.41 U	0.14 J	0.031 J	0.53 U	0.11 J	2	0.34 J	0.1 J	1.3
Fluorene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.087 J	0.35 U	0.4 U	0.038 J
Hexachlorobenzene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
Hexachlorobutadiene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
Hexachlorocyclopentadiene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
Hexachloroethane	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
Indeno(1,2,3-cd)pyrene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.048 J	0.48*	0.12 J	0.4 U	0.91*
Isophorone	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
Naphthalene	0.41 U	0.02 J	0.41 U	0.41 U	0.058 J	0.38 U	0.53 U	0.38 U	0.25 J	0.035 J	0.026 J	0.059 J
Nitrobenzene	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
N-Nitrosodi-n-propylamine	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.35 U	0.4 U	0.36 U
N-Nitrosodiphenylamine	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.027 J	0.35 U	0.4 U	0.36 U
Pentachlorophenol	1 U	0.86 U	1 U	1 U	1.3 U	0.96 U	1.3 U	0.94 U	0.92 U	0.88 U	1 U	0.9 U
Phenanthrene	0.41 U	0.34 U	0.033 J	0.034 J	0.17 J	0.021 J	0.53 U	0.063 J	1.7	0.18 J	0.1 J	0.57
Phenol	0.41 U	0.34 U	0.41 U	0.41 U	0.52 U	0.38 U	0.53 U	0.38 U	0.37 U	0.064 J	0.4 U	0.36 U
Pyrene	0.41 U	0.02 J	0.41 U	0.41 U	0.16 J	0.03 J	1.3 U	0.13 J	1.9	0.32 J	0.12 J	1.6
Metals												
Aluminum	3470	10400	1910	1140	5290	9920	6210	6890	14300	4970	8080	3290
Antimony	0.75 U	0.70 B	0.74 U	0.90 U	1.0 B	3.5 B	1.0 U	0.68 U	278*	2.9 B	8.4 B	2.1 B
Arsenic	20.7**	77.2**	1.6 B*	1.2 U	27.0**	12.2**	49.7**	6.0**	141**	56.0**	15.4**	6.6**
Barium	182	272	12.2 B	7.2 B	222	268	320	112	13000	824	318	93.8
Beryllium	2.0	5.8	0.25 U	0.30 U	3.1	0.68 B	3.3	0.62 B	0.77 B	2.6	1.9	1.1 B
Cadmium	0.47 B	6.6	0.43 B	0.30 U	0.38 B	0.23 U	0.33 U	0.57 B	0.69 B	3.9	16.3	1.4
Calcium	4060	5650	995 B	979 B	16400	25500	2280	12900	5410	19800	48800	98000
Chromium	5.5	23.6	17.6	8.5	14.0	12.6	16.5	17.3	62.0	50.7	43.2	18.7
Cobalt	6.0 B	16.2	2.0 B	1.4 B	9.6 B	7.9 B	8.7 B	6.6 B	17.5	11.2	13.8	4.3 B
Copper	26.8	91.8	136	96.9	73.0	18.3	41.5	22.5	1830	1680	191000**	405
Cyanide (total)	0.27 B	0.26 B	0.19 U	0.22 U	0.34 B	0.17 U	0.29 B	0.30 B	2.3	3.7	0.60 B	0.55
Iron	3240	9430	24200	15900	5890	19200	3120	13200	59500*	13800	92300*	16000
Lead	29.9	110	15.4	7.2	97.0	16.8	18.2	31.5	652*	1990**	12100**	242
Magnesium	1010 B	1480	565 B	560 B	8070	13200	596 B	6100	2480	18200	8860	36200
Manganese	98.2	99.1	427	265	72.8	621	45.2	681	614	236	693	344
Mercury	0.12 U	0.48	0.12 U	0.15 U	0.14 U	0.12 U	0.17 U	0.18	0.11 U	0.21	0.13 U	0.11 U
Nickel	10.4	34.6	18.7	11.3 B	20.0	15.1	16.6	12.9	78.3	85.0	139	24.2
Potassium	611 B	1390	126 B	86 B	810 B	1010 B	1230 B	886 B	1400	685 B	763 B	599 B
Selenium	1.3	8.8	0.99 U	1.2 U	6.3	0.93 U	8.6	0.90 U	2.1	2.8	2.6	0.93 B
Silver	0.25 U	0.21 U	0.25 U	0.30 U	0.28 U	0.23 U	0.33 U	0.45 B	0.23 B	0.90 B	7.6	0.22 U
Sodium	276 B	364 B	327 B	318 B	448 B	364 B	406 B	207 B	254 B	279 B	809 B	368 B
Thallium	1.0 U	1.8 B	2.1 B	1.3 B	1.7 B	2.4	1.3 U	2.2 B	4.0	1.5 B	4.5	1.3 B
Vanadium	18.3	92.6	1.2 B	0.62 B	47.7	24.0	61.9	17.4	18.5	33.6	28.1	15.6
Zinc	33.7	39.4	41.7	22.3	231	60.9	48.0	76.9	286	291	11500	159

TABLE A1.1

HISTORIC SOIL SAMPLING ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S1(EPA)*	*S2(EPA)*	*S3(EPA)*	*S4(EPA)*	*S5(EPA)*	*S6(EPA)*	*S7(EPA)*	*S8(EPA)*	*S9(EPA)*	*S10(EPA)*	*S11(EPA)*	*S01(OEPA)*	*S02(OEPA)*	*S03(OEPA)*	*S03(OEPA)*	*S04(OEPA)*	*S05(OEPA)*	*S06(OEPA)*	*S07(OEPA)*	*S08(OEPA)*	*S09(OEPA)*	*S10(OEPA)*	*S11(OEPA)*
Sample ID:			*S1*	*S2*	*S3*	*S4*	*S5*	*S6*	*S7*	*S8*	*S9*	*S10*	*S11*	*96-DV-03-S01*	*96-DV-03-S02*	*96-DV-03-S03*	*96-DV-03-D03*	*96-DV-03-S04*	*96-DV-03-S05*	*96-DV-03-S06*	*96-DV-03-S07*	*96-DV-03-S08*	*96-DV-03-S09*	*96-DV-03-S10*	*96-DV-03-S11*
Sample Date:			*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*10/23/1990*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*
Sample Depth:			*1-2 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*1-2 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*0-1 ft BGS*	*4-4.6 ft BGS*	*0-0.1 ft BGS*	*1.5-2 ft BGS*	*1.5-2 ft BGS Duplicate*	*1.5-2 ft BGS*	*-5 ft BGS*	*1.5-2.5 ft BGS*	*0-0.2 ft BGS*	*0.2-0.3 ft BGS*	*0.3-0.5 ft BGS*	*0-0.3 ft BGS*	*0.2-0.3 ft BGS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*																							
PCBs																									
Aroclor-1016 (PCB-1016)	3.9	21	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.034 U	0.041 U	0.041 U	0.052 U	0.038 U	0.053 U	0.038 U	0.037 U	0.035 U	0.04 U	0.036 U
Aroclor-1221 (PCB-1221)	0.14	0.54	-	-	-	-	-	-	-	-	-	-	-	0.083 U	0.069 U	0.083 U	0.084 U	0.1 U	0.078 U	0.11 U	0.076 U	0.074 U	0.071 U	0.082 U	0.073 U
Aroclor-1232 (PCB-1232)	0.14	0.54	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.034 U	0.041 U	0.041 U	0.052 U	0.038 U	0.053 U	0.038 U	0.037 U	0.035 U	0.04 U	0.036 U
Aroclor-1242 (PCB-1242)	0.22	0.74	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.034 U	0.041 U	0.041 U	0.052 U	0.038 U	0.053 U	0.038 U	0.037 U	0.035 U	0.04 U	0.036 U
Aroclor-1248 (PCB-1248)	0.22	0.74	0.36 X[a]	4.2 X[abc]	0.08 U	0.08 U	0.54 X[a]	0.08 U	0.08 U	0.08 U	0.08 U	1.4 X[abc]	0.08 U	0.041 U	0.034 U	0.041 U	0.041 U	0.052 U	0.038 U	0.053 U	0.038 U	0.037 U	0.035 U	0.04 U	0.036 U
Aroclor-1254 (PCB-1254)	0.22	0.74	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.034 U	0.041 U	0.041 U	0.052 U	0.038 U	0.053 U	0.038 U	0.037 U	0.83[abc]	0.17 P	0.036 U
Aroclor-1260 (PCB-1260)	0.22	0.74	0.3 JX[a]	2.8 X[abc]	0.58 JX[a]	0.16 U	0.11 JX	0.16 U	1.4 X[abc]	0.16 U	0.16 U	0.41 X[a]	0.46 JX[a]	0.041 U	0.034 U	0.041 U	0.041 U	0.052 U	0.038 U	0.053 U	0.038 U	0.037 U	1.2[abc]	0.04 U	0.036 U
Pesticides																									
4,4'-DDD	2	7.2	-	-	-	-	-	-	-	-	-	-	-	0.0041 U	0.0034 U	0.0041 U	0.0041 U	0.0052 U	0.0038 U	0.0053 U	0.00065 J	0.0037 U	0.0035 U	0.0040 U	0.0044
4,4'-DDE	1.4	5.1	-	-	-	-	-	-	-	-	-	-	-	0.0041 U	0.0034 U	0.0041 U	0.0041 U	0.0026 J	0.00044 PJ	0.0053 U	0.0038 U	0.0024 PJ	0.0035 U	0.0040 U	0.0036 U
4,4'-DDT	1.7	7	-	-	-	-	-	-	-	-	-	-	-	0.00060 PJ	0.0034 U	0.0041 U	0.0041 U	0.0052 U	0.00071 PJ	0.0053 U	0.0016 PJ	0.0088 P	0.0035 U	0.0040 U	0.0036 U
Aldrin	0.029	0.1	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.0018 U	0.0021 U	0.0021 U	0.0026 U	0.0020 U	0.0027 U	0.0019 U	0.0019 U	0.0018 U	0.0021 U	0.0018 U
alpha-BHC	0.077	0.27	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.0018 U	0.0021 U	0.0021 U	0.0026 U	0.0020 U	0.0027 U	0.0019 U	0.00071 PJ	0.0018 U	0.0021 U	0.0018 U
alpha-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.0018 U	0.0021 U	0.0021 U	0.0054 P	0.0020 U	0.0027 U	0.0019 U	0.0019 U	0.0018 U	0.0021 U	0.0018 U
beta-BHC	0.27	0.96	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.0018 U	0.0021 U	0.0021 U	0.0026 U	0.0020 U	0.0027 U	0.0019 U	0.0019 U	0.0018 U	0.0021 U	0.0018 U
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.0018 U	0.0021 U	0.0021 U	0.0026 U	0.0020 U	0.0027 U	0.0019 U	0.0019 U	0.0018 U	0.0021 U	0.0018 U
Dieldrin	0.03	0.11	-	-	-	-	-	-	-	-	-	-	-	0.0041 U	0.0034 U	0.0041 U	0.0041 U	0.0052 U	0.0038 U	0.0053 U	0.0038 U	0.0037 U	0.0035 U	0.0040 U	0.0036 U
Endosulfan I	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.0018 U	0.0021 U	0.0021 U	0.0026 U	0.0020 U	0.0027 U	0.00042 PJ	0.0019 U	0.0018 U	0.0021 U	0.0018 U
Endosulfan II	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0041 U	0.0034 U	0.0041 U	0.0041 U	0.0052 U	0.0038 U	0.0053 U	0.0014 J	0.0054	0.0035 U	0.0040 U	0.0036 U
Endosulfan sulfate	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0041 U	0.0034 U	0.0041 U	0.0041 U	0.0052 U	0.0038 U	0.0053 U	0.0038 U	0.0037 U	0.0035 U	0.0040 U	0.0036 U
Endrin	18	180	-	-	-	-	-	-	-	-	-	-	-	0.0014 PJ	0.0034 U	0.0023 PJ	0.0041 U	0.0052 U	0.0038 U	0.0053 U	0.0038 U	0.0037 U	0.0035 U	0.0040 U	0.0036 U
[illegible]drin aldehyde	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0022 PJ	0.0034 U	0.0066	0.0066 P	0.0052 U	0.0040 P	0.0053 U	0.0064 P	0.0037 U	0.0035 U	0.0040 U	0.0036 U
[illegible]drin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0041 U	0.0034 U	0.0041 U	0.0041 U	0.0052 U	0.0038 U	0.0053 U	0.0038 U	0.0037 U	0.0035 U	0.0040 U	0.0075 P
[illegible]mma-BHC (lindane)	0.52	2.1	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.0018 U	0.0021 U	0.0021 U	0.0026 U	0.0020 U	0.0027 U	0.0019 U	0.0018 J	0.0018 U	0.00077 PJ	0.00042 J
gamma-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.00035 PJ	0.0021 U	0.00096 PJ	0.0043	0.0020 U	0.0027 U	0.0019 U	0.0019 U	0.0018 U	0.0021 U	0.0023 P
Heptachlor	0.11	0.38	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.0018 U	0.0021 U	0.0021 U	0.0026 U	0.0020 U	0.0027 U	0.0019 U	0.0019 U	0.0018 U	0.0021 U	0.0018 U
Heptachlor epoxide	0.053	0.19	-	-	-	-	-	-	-	-	-	-	-	0.0021 U	0.0018 U	0.0021 U	0.00049 PJ	0.00078 PJ	0.0020 U	0.0027 U	0.0019 U	0.0019 U	0.0018 U	0.0021 U	0.0018 U
Methoxychlor	310	3100	-	-	-	-	-	-	-	-	-	-	-	0.021 U	0.018 U	0.0018 PJ	0.021 U	0.026 U	0.00094 PJ	0.027 U	0.019 U	0.019 U	0.018 U	0.021 U	0.018 U
Toxaphene	0.44	1.6	-	-	-	-	-	-	-	-	-	-	-	0.21 U	0.18 U	0.24 U	0.21 U	0.26 U	0.2 U	0.27 U	0.19 U	0.19 U	0.18 U	0.21 U	0.18 U

Notes:
All concentrations are expressed in units of milligrams per kilogram (mg/kg) unless otherwise noted.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).

B - Compound is found in the associated blank as well as in the sample (Organics).

D - Compounds at secondary dilution factor.

E - Estimated or not reported due to interference. (Inorganics)

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument. (Organics)

J - Indicates an estimated value.

P - Indicates there is a greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported.

U - Compound was analyzed for but not detected.

W - Post-digestion spike for furnace AA analysis is out of control limits (35-115%), while sample absorbance is <50% of spike absorbance.

X - Denotes manually entered data. This always occurs on multi-component quantitations and sometimes occurs on individual pesticides when the analyst had to correct the integration of a peak.

-- Not applicable.

TABLE A1.2

SUMMARY OF FID/PID FIELD SCREENING OF SOIL GAS SAMPLES - PSARA (1996)
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

				Petroleum Products	
			Parameter:	*Total Hydrocarbons - FID*	*Total Hydrocarbons - PID*
			Units:	*ppmv*	*ppmv*
Sample Location	*Sample ID*	*Sample Date*	*Sample Depth*		
SD001	SD 001	2/19/1996	14-16 ft BGS	29	-
SD001	SD 001	2/19/1996	16-18 ft BGS	160	-
SD001	SD 001	2/19/1996	18-20 ft BGS	300	-
SD001	SD 001	2/19/1996	20-22 ft BGS	18	-
SD002	SD 002	2/19/1996	0-2 ft BGS	0.0	-
SD002	SD 002	2/19/1996	2-4 ft BGS	0.2	-
SD002	SD 002	2/19/1996	4-6 ft BGS	0.0	-
SD002	SD 002	2/19/1996	6-8 ft BGS	0.0	-
SD002	SD 002	2/19/1996	8-10 ft BGS	0.0	-
SD002	SD 002	2/19/1996	10-12 ft BGS	0.0	-
SD002	SD 002	2/19/1996	12-14 ft BGS	6.8	-
SD002	SD 002	2/19/1996	14-16 ft BGS	11	-
SD002	SD 002	2/19/1996	16-18 ft BGS	6.6	-
SD002	SD 002	2/19/1996	18-20 ft BGS	60	-
SD002	SD 002	2/19/1996	20-22 ft BGS	400	-
SD002	SD 002	2/19/1996	22-24 ft BGS	180	-
SD002	SD 002	2/19/1996	24-26 ft BGS	160	-
SD003	SD 003	2/19/1996	0-2 ft BGS	8.4	2.8
SD003	SD 003	2/19/1996	2-4 ft BGS	540	5.2
SD003	SD 003	2/19/1996	4-6 ft BGS	22	16.8
SD004	SD 004	2/19/1996	0-2 ft BGS	6.0	5.1
SD004	SD 004	2/19/1996	2-4 ft BGS	1.4	3.8
SD004	SD 004	2/19/1996	4-6 ft BGS	2.2	5.0
SD004	SD 004	2/19/1996	6-8 ft BGS	2.1	4.8
SD004	SD 004	2/19/1996	8-10 ft BGS	5.8	4.8
SD004	SD 004	2/19/1996	10-12 ft BGS	18	40
SD004A	SD 004A	2/19/1996	0-2 ft BGS	2.8	4.2
SD004A	SD 004A	2/19/1996	2-4 ft BGS	1.8	3.0
SD004A	SD 004A	2/19/1996	4-6 ft BGS	4.0	3.2
SD004A	SD 004A	2/19/1996	6-8 ft BGS	3.8	4.2
SD004A	SD 004A	2/19/1996	8-10 ft BGS	3.0	4.0
SD004A	SD 004A	2/19/1996	10-12 ft BGS	7.2	6.8
SD004A	SD 004A	2/19/1996	14-16 ft BGS	4.2	3.8
SD004A	SD 004A	2/19/1996	16-18 ft BGS	24	8.0
SD004A	SD 004A	2/19/1996	18-20 ft BGS	2.8	4.0
SD004A	SD 004A	2/19/1996	20-22 ft BGS	22	7.5
SD004A	SD 004A	2/19/1996	22-24 ft BGS	5.2	5.8
SD004A	SD 004A	2/19/1996	24-26 ft BGS	8.6	5.4
SD004A	SD 004A	2/19/1996	26-28 ft BGS	4.8	4.6

TABLE A1.2

SUMMARY OF FID/PID FIELD SCREENING OF SOIL GAS SAMPLES - PSARA (1996)
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

				Petroleum Products	
			Parameter:	*Total Hydrocarbons - FID*	*Total Hydrocarbons - PID*
			Units:	*ppmv*	*ppmv*
Sample Location	*Sample ID*	*Sample Date*	*Sample Depth*		
SD005	SD 005	2/19/1996	0-2 ft BGS	3.6	1.2
SD005	SD 005	2/19/1996	2-4 ft BGS	4.0	1.6
SD005	SD 005	2/19/1996	4-6 ft BGS	3.2	1.6
SD005	SD 005	2/19/1996	6-8 ft BGS	2.6	2.0
SD005	SD 005	2/19/1996	8-10 ft BGS	2.8	1.0
SD005	SD 005	2/19/1996	10-12 ft BGS	3.0	1.2
SD005	SD 005	2/19/1996	14-16 ft BGS	14	10.2
SD005	SD 005	2/19/1996	16-18 ft BGS	10	16
SD005	SD 005	2/19/1996	18-20 ft BGS	12	6.2
SD005	SD 005	2/19/1996	20-22 ft BGS	7.8	3.6
SD005	SD 005	2/19/1996	22-24 ft BGS	24	5.0
SD005	SD 005	2/19/1996	24-26 ft BGS	10	3.2
SD006	SD 006	2/19/1996	0-2 ft BGS	12	4
SD006	SD 006	2/19/1996	2-4 ft BGS	500	4
SD006A	SD 006A	2/19/1996	0-2 ft BGS	1	3
SD006A	SD 006A	2/19/1996	2-4 ft BGS	1000	6
SD006A	SD 006A	2/19/1996	4-6 ft BGS	1000	11
SD006B	SD 006B	2/19/1996	0-2 ft BGS	6	12
SD007	SD 007	2/19/1996	0-2 ft BGS	5	3
SD007	SD 007	2/19/1996	2-4 ft BGS	5	1
SD007	SD 007	2/19/1996	4-6 ft BGS	80	4
SD007	SD 007	2/19/1996	6-8 ft BGS	20	1
SD007	SD 007	2/19/1996	8-10 ft BGS	100	3
SD007	SD 007	2/19/1996	10-12 ft BGS	300	2
SD007	SD 007	2/19/1996	12-14 ft BGS	20	1

Notes:
- - Not applicable.
ft BGS - feet below ground surface

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-103	MW-103
Sample ID:			96-DV-03-S23	96-DV-03-D23	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	96-DV-03-S25	MW102	MW102	MW102	MW102	MW102	MW102	MW102	MW102	MW102	MW102	96-DV-03-S24	MW103
Sample Date:			7/9/1996	7/9/1996	1/6/1998	5/28/1998	2/19/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/1/2004	10/15/2004	8/4/2005	7/9/1996	1/6/1998	5/28/1998	2/17/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/1/2004	10/14/2004	8/2/2005	7/9/1996	1/6/1998
	USEPA Regional Screening Levels			Duplicate																							
Parameter	MCL a	TapWater b																									
Volatiles																											
1,1,1-Trichloroethane	0.2	9.1	0.01 U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
1,1,2,2-Tetrachloroethane	-	0.000067	0.01 U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
1,1,2-Trichloroethane	0.005	0.00024	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
1,1-Dichloroethane	-	0.0024	0.013[b]	0.013[b]	0.016[b]	20[b]	0.014[b]	U	0.032[b]	0.031[b]	0.039[b]	0.0087[b]	0.0096[b]	0.0062[b]	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
1,1-Dichloroethene	0.007	0.34	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
1,2,4-Trimethylbenzene	-	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.005	0.00015	0.01 U	0.01 U	U	U	U	0.034[ab]	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
1,2-Dichloroethene (total)	-	0.33	0.15	0.14	0.18	0.27	0.2	U	0.41[b]	0.4[b]	0.48[b]	0.041	0.092	0.057	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
1,2-Dichloropropane	0.005	0.00039	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	7.1	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2-Hexanone	-	0.047	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Acetone	-	22	0.03	0.029	U	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
Benzene	0.005	0.00041	0.01 U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
Bromodichloromethane	-	0.00012	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Bromoform	-	0.0085	0.01 U	0.01 U	U	0.0006 J	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
Bromomethane (Methyl bromide)	-	0.0087	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Carbon disulfide	-	1	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Carbon tetrachloride	0.005	0.0002	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Chlorobenzene	0.1	0.091	0.01 U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
Chloroethane	-	21	0.002 J	0.01 U	U	U	U	U	U	U	U	U	U	U	0.022	U	U	U	U	U	U	U	U	U	U	0.01 U	U
Chloroform (Trichloromethane)	-	0.00019	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Chloromethane (Methyl chloride)	-	0.19	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
cis-1,2-Dichloroethene	0.07	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Dibromochloromethane	-	0.00015	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Ethylbenzene	0.7	0.0015	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
m&p-Xylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	0.005	0.0048	0.01 U	0.004 J	U	U	0.0014 JB	0.005 B[b]	U	U	U	U	U	U	0.006 J[ab]	U	U	0.0033 J	U	U	U	U	U	U	U	0.01 U	U
o-Xylene	-	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.1	1.6	0.01 U	0.01 U	U	0.00078 J	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
Tetrachloroethene	0.005	0.00011	0.01 U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U	U	0.0016 J[b]	U	U	U	U	U	U	U	0.01 U	U
Toluene	1	2.3	0.01 U	0.001 J	U	0.0072 J	0.0051 J	U	U	U	U	U	U	U	0.015	U	0.0069	0.0009 J	U	U	U	U	U	U	U	0.01 U	0.00036 J
trans-1,3-Dichloropropene	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Trichloroethene	0.005	0.002	0.01 U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U	0.00066 J	0.0007 J	U	U	U	U	U	U	U	0.01 U	0.0032[b]
Vinyl chloride	0.002	0.000016	0.004 J[ab]	0.004 J[ab]	0.032[ab]	0.088[ab]	0.048[ab]	U	0.15[ab]	0.14[ab]	0.18[ab]	0.014[ab]	0.02[ab]	0.012[ab]	0.01 U	U	U	U	U	U	U	U	U	U	U	0.01 U	U
Xylene (total)	10	0.2	0.01 U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.004 J	U	U	U	U	U	U	U	U	U	U	0.01 U	U
Semi-Volatiles																											
1,2,4-Trichlorobenzene	0.07	0.0023	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
1,2-Dichlorobenzene	0.6	0.37	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
1,3-Dichlorobenzene	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
1,4-Dichlorobenzene	0.075	0.00043	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2,4,5-Trichlorophenol	-	3.7	0.025 U	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-
2,4,6-Trichlorophenol	-	0.0061	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2,4-Dichlorophenol	-	0.11	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2,4-Dimethylphenol	-	0.73	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2,4-Dinitrophenol	-	0.073	0.025 U	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-
2,4-Dinitrotoluene	-	0.00022	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2,6-Dinitrotoluene	-	0.037	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2-Chloronaphthalene	-	2.9	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2-Chlorophenol	-	0.18	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2-Methylnaphthalene	-	0.15	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2-Methylphenol	-	1.8	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
2-Nitroaniline	-	0.37	0.025 U	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-
2-Nitrophenol	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
3,3'-Dichlorobenzidine	-	0.00015	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-103*	*MW-103*
Sample ID:			*96-DV-03-S23*	*96-DV-03-D23*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*96-DV-03-S25*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*96-DV-03-S24*	*MW103*
Sample Date:			*7/9/1996*	*7/9/1996*	*1/6/1998*	*5/28/1998*	*2/19/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/15/2004*	*8/4/2005*	*7/9/1996*	*1/6/1998*	*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*	*7/9/1996*	*1/6/1998*
	USEPA Regional Screening Levels			*Duplicate*																							
Parameter	*MCL a*	*TapWater b*																									
Semi-Volatiles (continued)																											
3-Nitroaniline	-	-	0.025 U	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-
4,6-Dinitro-2-methylphenol	-	0.0037	0.025 U	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-
4-Bromophenyl phenyl ether	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
4-Chloro-3-methylphenol	-	3.7	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
4-Chloroaniline	-	0.00034	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
4-Chlorophenyl phenyl ether	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
4-Methylphenol	-	0.18	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
4-Nitroaniline	-	0.0034	0.025 U	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-
4-Nitrophenol	-	-	0.025 U	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-
Acenaphthene	-	2.2	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Acenaphthylene	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Anthracene	-	11	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Benzo(a)anthracene	-	0.000029	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Benzo(a)pyrene	0.0002	0.0000029	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Benzo(b)fluoranthene	-	0.000029	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Benzo(g,h,i)perylene	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Benzo(k)fluoranthene	-	0.00029	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
bis(2-Chloroethoxy)methane	-	0.11	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
bis(2-Chloroethyl)ether	-	0.000012	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	0.002 J	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.002 J	-
Butyl benzylphthalate (BBP)	-	0.035	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Chrysene	-	0.0029	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Dibenz(a,h)anthracene	-	0.0000029	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Dibenzofuran	-	0.037	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Diethyl phthalate	-	29	0.01 JBU	0.01 JBU	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Dimethyl phthalate	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Di-n-butylphthalate (DBP)	-	3.7	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Di-n-octyl phthalate (DnOP)	-	-	0.001 J	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Fluoranthene	-	1.5	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Fluorene	-	1.5	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Hexachlorobenzene	0.001	0.000042	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Hexachlorobutadiene	-	0.00086	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Hexachlorocyclopentadiene	0.05	0.22	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Hexachloroethane	-	0.0048	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Indeno(1,2,3-cd)pyrene	-	0.000029	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Isophorone	-	0.071	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Naphthalene	-	0.00014	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Nitrobenzene	-	0.00012	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
N-Nitrosodi-n-propylamine	-	0.0000096	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
N-Nitrosodiphenylamine	-	0.014	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Pentachlorophenol	0.001	0.00056	0.025 U	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	0.025 U	-
Phenanthrene	-	-	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Phenol	-	11	0.13 BB	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-
Pyrene	-	1.1	0.01 U	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	0.01 U	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-101A	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-102	MW-103	MW-103
Sample ID:			96-DV-03-S23	96-DV-03-D23	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	MW101A	96-DV-03-S25	MW102	MW102	MW102	MW102	MW102	MW102	MW102	MW102	MW102	MW102	96-DV-03-S24	MW103
Sample Date:			7/8/1996	7/8/1996	1/6/1998	5/28/1998	2/19/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/1/2004	10/15/2004	8/4/2005	7/8/1996	1/6/1998	5/28/1998	2/17/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/1/2004	10/14/2004	8/2/2005	7/8/1996	1/6/1998
	USEPA Regional Screening Levels			Duplicate																							
Parameter	MCL a	TapWater b																									
Metals																											
Aluminum	-	37	10	0.361	-	-	-	-	-	-	-	-	-	-	0.183 B	-	-	-	-	-	-	-	-	-	-	0.0984 B	-
Antimony	0.006	0.015	0.0030 U	0.0030 U	-	-	-	-	-	-	-	-	-	-	0.0030 U	-	-	-	-	-	-	-	-	-	-	0.0030 U	-
Arsenic	0.01	0.000045	0.0096 B[b]	0.0040 U	U	U	U	-	-	-	-	-	-	-	0.0040 U	U	U	U	-	-	-	-	-	-	-	0.0040 U	U
Barium	2	7.3	0.33	0.347	U	U	0.24	-	-	-	-	-	-	-	0.0844 B	U	U	U	-	-	-	-	-	-	-	0.0925 B	U
Beryllium	0.004	0.073	0.0010 U	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-
Cadmium	0.005	0.018	0.0010 U	0.0010 U	U	U	U	-	-	-	-	-	-	-	0.0010 U	U	U	U	-	-	-	-	-	-	-	0.0010 U	U
Calcium	-	-	224	81.7	-	-	-	-	-	-	-	-	-	-	87	-	-	-	-	-	-	-	-	-	-	78.8	-
Chromium	-	-	0.0174	0.0012 B	0.012	U	0.026	-	-	-	-	-	-	-	0.0010 U	0.069	U	0.024	-	-	-	-	-	-	-	0.0076 B	0.017
Cobalt	-	0.011	0.0123 B[b]	0.0020 B	-	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-
Copper	1.3	1.5	0.0308	0.0049 B	-	-	-	-	-	-	-	-	-	-	0.0031 B	-	-	-	-	-	-	-	-	-	-	0.0032 B	-
Cyanide (total)	0.2	0.73	0.0030 U	0.0030 U	-	-	-	-	-	-	-	-	-	-	0.0030 U	-	-	-	-	-	-	-	-	-	-	0.0030 U	-
Iron	-	26	20.6	0.72	-	-	-	-	-	-	-	-	-	-	0.332	-	-	-	-	-	-	-	-	-	-	0.18	-
Iron (dissolved)	-	26	-	-	-	1	1.6	-	-	-	-	-	-	-	-	-	0.32	0.64	-	-	-	-	-	-	-	-	-
Lead	0.015	-	0.0215[a]	0.0087	U	U	U	-	-	-	-	-	-	-	0.0011 B	U	U	U	-	-	-	-	-	-	-	0.0028 B	U
Magnesium	-	-	76.8	12.4	-	-	-	-	-	-	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	23.1	-
Manganese	-	0.88	1[b]	0.0867	-	-	-	-	-	-	-	-	-	-	0.107	-	-	-	-	-	-	-	-	-	-	0.0463	-
Mercury	0.002	0.00057	0.00020 U	0.00020 U	U	U	-	-	-	-	-	-	-	-	0.00020 U	U	U	-	-	-	-	-	-	-	-	0.00020 U	U
Nickel	-	0.73	0.0297 B	0.0142 B	-	-	-	-	-	-	-	-	-	-	0.0022 B	-	-	-	-	-	-	-	-	-	-	0.0011 B	-
Potassium	-	-	39.6	114	-	-	-	-	-	-	-	-	-	-	3.39 B	-	-	-	-	-	-	-	-	-	-	2.72 B	-
Selenium	0.05	0.18	0.0040 U	0.0040 U	U	U	-	-	-	-	-	-	-	-	0.0040 U	U	U	-	-	-	-	-	-	-	-	0.0040 U	U
Silver	-	0.18	0.0010 U	0.0010 U	U	U	-	-	-	-	-	-	-	-	0.0010 U	U	U	-	-	-	-	-	-	-	-	0.0010 U	U
Sodium	-	-	46.2	98.7	-	-	-	-	-	-	-	-	-	-	12.4	-	-	-	-	-	-	-	-	-	-	13.4	-
Thallium	0.002	-	0.0044 B[a]	0.0040 U	-	-	-	-	-	-	-	-	-	-	0.0040 U	-	-	-	-	-	-	-	-	-	-	0.0040 U	-
Vanadium	-	0.18	0.0209 B	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-
Zinc	-	11	0.0777	0.01 B	-	-	-	-	-	-	-	-	-	-	0.0095 B	-	-	-	-	-	-	-	-	-	-	0.0072 B	-
PCBs																											
Aroclor-1016 (PCB-1016)	-	0.00096	0.0010 U	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-
Aroclor-1221 (PCB-1221)	-	0.0000068	0.0020 U	0.0020 U	-	-	-	-	-	-	-	-	-	-	0.0020 U	-	-	-	-	-	-	-	-	-	-	0.0020 U	-
Aroclor-1232 (PCB-1232)	-	0.0000068	0.0010 U	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-
Aroclor-1242 (PCB-1242)	-	0.000034	0.0010 U	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-
Aroclor-1248 (PCB-1248)	-	0.000034	0.0010 U	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-
Aroclor-1254 (PCB-1254)	-	0.000034	0.0010 U	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-
Aroclor-1260 (PCB-1260)	-	0.000034	0.0010 U	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	0.0010 U	-
Pesticides																											
4,4'-DDD	-	0.00028	0.00010 U	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-
4,4'-DDE	-	0.0002	0.00010 U	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-
4,4'-DDT	-	0.0002	0.00010 U	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-
Aldrin	-	0.000004	0.000050 U	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-
alpha-BHC	-	0.000011	0.000050 U	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-
alpha-Chlordane	-	-	0.000050 U	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-
beta-BHC	-	0.000037	0.000050 U	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-
delta-BHC	-	-	0.000050 U	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-
Dieldrin	-	0.0000042	0.00010 U	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-
Endosulfan I	-	-	0.000050 U	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-
Endosulfan II	-	-	0.00010 U	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-
Endosulfan sulfate	-	-	0.00010 U	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-
Endrin	0.002	0.011	0.00010 U	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-
Endrin aldehyde	-	-	0.00010 U	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-
Endrin ketone	-	-	0.00010 U	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	0.00010 U	-
gamma-BHC (lindane)	0.0002	0.000061	0.000050 U	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-
gamma-Chlordane	-	-	0.000050 U	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-
Heptachlor	0.0004	0.000015	0.000061 PJ[b]	0.0000082 PJ	-	-	-	-	-	-	-	-	-	-	0.0000092 PJ	-	-	-	-	-	-	-	-	-	-	0.0000095 PJ	-
Heptachlor epoxide	0.0002	0.0000074	0.000050 U	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	0.000050 U	-
Methoxychlor	0.04	0.18	0.00050 U	0.00050 U	-	-	-	-	-	-	-	-	-	-	0.00050 U	-	-	-	-	-	-	-	-	-	-	0.00050 U	-
Toxaphene	0.003	0.000061	0.0050 U	0.0050 U	-	-	-	-	-	-	-	-	-	-	0.0050 U	-	-	-	-	-	-	-	-	-	-	0.0050 U	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-101A*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-102*	*MW-103*	*MW-103*
Sample ID:			*96-DV-03-S23*	*96-DV-03-D23*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*MW101A*	*96-DV-03-S25*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*MW102*	*96-DV-03-S24*	*MW103*
Sample Date:			*7/9/1996*	*7/9/1996*	*1/6/1998*	*5/28/1998*	*2/19/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/15/2004*	*8/4/2005*	*7/9/1996*	*1/6/1998*	*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*	*7/9/1996*	*1/6/1998*
	USEPA Regional Screening Levels			*Duplicate*																							
Parameter	*MCL a*	*TapWater b*																									
Gases																											
Ethane	-	-	-	-	-	5.6	0.0051	-	-	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	-	-
Ethene	-	-	-	-	-	4	0.0067	-	-	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	-	-
Methane	-	-	-	-	-	0.83 D/0.27 E	0.69 D/0.29 E	-	-	-	-	-	-	-	-	-	U	0.0007	-	-	-	-	-	-	-	-	-
General Chemistry																											
Alkalinity, total (as CaCO3)	-	-	-	-	-	530	450	-	-	-	-	-	-	-	-	-	350	280	-	-	-	-	-	-	-	-	-
Ammonia-N	-	-	-	-	-	0.9	0.6	-	-	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	-	-
Chloride	-	-	-	-	-	16.2	14.7	-	-	-	-	-	-	-	-	-	27.1	40.8	-	-	-	-	-	-	-	-	-
Nitrate (as N)	10	58	-	-	-	U	U	-	-	-	-	-	-	-	-	-	4.3	7.1	-	-	-	-	-	-	-	-	-
Sulfate	-	-	-	-	-	31.1	30.2	-	-	-	-	-	-	-	-	-	44.8	50.1	-	-	-	-	-	-	-	-	-
Total organic carbon (TOC)	-	-	-	-	-	3	4	-	-	-	-	-	-	-	-	-	U	1	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).

B - Compound is found in the associated blank as well as in the sample (Organics).

D - Result was obtained from the analysis of a dilution.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.

J - Indicates an estimated value.

P - Indicates there is a greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported.

U - Compound was analyzed for but not detected.

- - Not applicable.

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			MW-103	MW-103	MW-103	MW-103	MW-103	MW-103	MW-103	MW-103	MW-103	MW-104	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202
Sample ID:			MW103	MW103	MW103	MW103	MW103	MW103	MW103	MW103	MW103	96-DV-03-S22	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW202	MW202	MW202	MW202	MW202	MW202	MW202	MW202	MW202
Sample Date:			5/28/1998	2/17/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/1/2004	10/14/2004	8/2/2005	7/9/1996	5/28/1998	2/16/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/1/2004	10/15/2004	8/2/2005	5/28/1998	2/17/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/2/2004	10/15/2004	8/3/2005
	USEPA Regional Screening Levels																													
Parameter	MCL a	TapWater b																												
Volatiles																														
1,1,1-Trichloroethane	0.2	9.1	U	U	U	U	U	U	U	U	U	0.01 U	0.0073	0.006	0.0084	0.0089	0.0069	0.0052	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	-	0.000067	0.001 J[b]	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	0.005	0.00024	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	0.0024	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethene	0.007	0.34	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	-	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.005	0.00015	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	0.0026 J[b]	U	U	U	U	U	U	U	U
1,2-Dichloroethene (total)	-	0.33	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	0.003	U	U	U	U	U	U	U
1,2-Dichloropropane	0.005	0.00039	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	7.1	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	-	0.047	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	-	22	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Benzene	0.005	0.00041	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromodichloromethane	-	0.00012	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	-	0.0085	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromomethane (Methyl bromide)	-	0.0087	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	-	1	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	0.005	0.0002	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.1	0.091	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroethane	-	21	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroform (Trichloromethane)	-	0.00019	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl chloride)	-	0.19	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	0.07	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	0.00015	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.7	0.0015	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m&p-Xylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	0.005	0.0048	U	0.0022 J	U	U	U	U	U	U	U	0.01 U	U	0.003 J	U	U	U	U	U	U	U	U	0.003 J	U	U	U	U	U	U	U
o-Xylene	-	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.1	1.6	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetrachloroethene	0.005	0.00011	U	0.0005 J[b]	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Toluene	1	2.3	0.0067	0.0007 J	U	U	U	U	U	U	U	0.01 U	0.0035 J	0.002 J	U	U	U	U	U	U	U	0.0083	0.009	U	0.0062	U	U	U	U	U
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.005	0.002	0.0051[ab]	0.004[b]	0.008[ab]	0.005[b]	U	U	U	U	U	0.01 U	0.018[ab]	0.017[ab]	0.021[ab]	0.022[ab]	0.021[ab]	0.017[ab]	0.0059[ab]	0.008[ab]	0.0057[ab]	0.038[ab]	0.039[ab]	0.039[ab]	0.035[ab]	0.041[ab]	0.031[ab]	0.011[ab]	0.012[ab]	0.0081[ab]
Vinyl chloride	0.002	0.000016	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Xylene (total)	10	0.2	U	U	U	U	U	U	U	U	U	0.01 U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Semi-Volatiles																														
1,2,4-Trichlorobenzene	0.07	0.0023	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	0.6	0.37	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	0.075	0.00043	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3.7	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	0.0061	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	0.11	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	0.73	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	0.073	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.00022	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	0.037	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2.9	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	0.18	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	0.15	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1.8	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	0.37	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.00015	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-104*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*
Sample ID:			*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*96-DV-03-S22*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*
Sample Date:			*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*	*7/9/1996*	*5/28/1998*	*2/16/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/15/2004*	*8/2/2005*	*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/15/2004*	*8/3/2005*
	USEPA Regional Screening Levels																													
Parameter	*MCL*	*TapWater*																												
	a	*b*																												
Semi-Volatiles (continued)																														
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	0.0037	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	-	0.00034	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	0.18	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	0.0034	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2.2	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	0.11	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.000012	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	-	-	-	-	0.001 J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	0.035	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	0.0029	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	0.037	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29	-	-	-	-	-	-	-	-	-	0.01 JBU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3.7	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	0.003 J	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1.5	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1.5	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.00086	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	0.05	0.22	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	0.0048	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	0.071	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.00014	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.00012	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0000096	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	0.014	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	0.001	0.00056	-	-	-	-	-	-	-	-	-	0.025 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1.1	-	-	-	-	-	-	-	-	-	0.01 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			MW-103	MW-103	MW-103	MW-103	MW-103	MW-103	MW-103	MW-103	MW-103	MW-104	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-201	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202	MW-202
Sample ID:			MW103	MW103	MW103	MW103	MW103	MW103	MW103	MW103	MW103	96-DV-03-S22	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW201	MW202	MW202	MW202	MW202	MW202	MW202	MW202	MW202	MW202
Sample Date:			5/28/1998	2/17/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/1/2004	10/14/2004	8/2/2005	7/8/1996	5/28/1998	2/16/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/1/2004	10/15/2004	8/2/2005	5/28/1998	2/17/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/2/2004	10/15/2004	8/3/2005
	USEPA Regional Screening Levels																													
Parameter	MCL a	TapWater b																												
Metals																														
Aluminum	-	37	-	-	-	-	-	-	-	-	-	5.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	0.006	0.015	-	-	-	-	-	-	-	-	-	0.0030 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	0.01	0.000045	U	U	-	-	-	-	-	-	-	0.547[ab]	U	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-
Barium	2	7.3	U	U	-	-	-	-	-	-	-	2.53[a]	0.2	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-
Beryllium	0.004	0.073	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	0.005	0.018	U	U	-	-	-	-	-	-	-	0.0010 U	U	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-
Calcium	-	-	-	-	-	-	-	-	-	-	-	190	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	-	-	0.011	0.055	-	-	-	-	-	-	-	0.0173	U	U	-	-	-	-	-	-	-	U	0.01	-	-	-	-	-	-	-
Cobalt	-	0.011	-	-	-	-	-	-	-	-	-	0.0246 B[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	1.3	1.5	-	-	-	-	-	-	-	-	-	0.0278	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	0.2	0.73	-	-	-	-	-	-	-	-	-	0.0092 B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	-	26	-	-	-	-	-	-	-	-	-	38[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (dissolved)	-	26	1	1.9	-	-	-	-	-	-	-	-	1	0.69	-	-	-	-	-	-	-	1.1	0.84	-	-	-	-	-	-	-
Lead	0.015	-	U	U	-	-	-	-	-	-	-	0.0134	U	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-
Magnesium	-	-	-	-	-	-	-	-	-	-	-	75.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	0.88	-	-	-	-	-	-	-	-	-	1[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	0.002	0.00057	U	-	-	-	-	-	-	-	-	0.00020 U	U	-	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-
Nickel	-	0.73	-	-	-	-	-	-	-	-	-	0.0173 B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	-	-	-	-	-	-	-	-	-	-	-	9.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	0.05	0.18	U	-	-	-	-	-	-	-	-	0.0083	U	-	-	-	-	-	-	-	-	0.015	-	-	-	-	-	-	-	-
Silver	-	0.18	U	-	-	-	-	-	-	-	-	0.0010 U	U	-	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-
[illegible]dium	-	-	-	-	-	-	-	-	-	-	-	81.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]allium	0.002	-	-	-	-	-	-	-	-	-	-	0.0046 B[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	0.18	-	-	-	-	-	-	-	-	-	0.0148 B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	-	11	-	-	-	-	-	-	-	-	-	0.0897	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs																														
Aroclor-1016 (PCB-1016)	-	0.00096	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	0.0000068	-	-	-	-	-	-	-	-	-	0.0020 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	-	0.0000068	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	-	0.000034	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	-	0.000034	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	-	0.000034	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	0.000034	-	-	-	-	-	-	-	-	-	0.0010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides																														
4,4'-DDD	-	0.00028	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	-	0.0002	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	-	0.0002	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	-	0.000004	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	-	0.000011	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-Chlordane	-	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
beta-BHC	-	0.000037	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	-	0.0000042	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	-	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	-	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	-	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	0.002	0.011	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	0.00010 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (lindane)	0.0002	0.000061	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	0.0004	0.000015	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	0.0002	0.0000074	-	-	-	-	-	-	-	-	-	0.000050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	0.04	0.18	-	-	-	-	-	-	-	-	-	0.00050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]aphene	0.003	0.000061	-	-	-	-	-	-	-	-	-	0.0050 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-103*	*MW-104*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-201*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*	*MW-202*
Sample ID:			*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*MW103*	*96-DV-03-S22*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW201*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*	*MW202*
Sample Date:			*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*	*7/3/1996*	*5/28/1998*	*2/16/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/15/2004*	*8/2/2005*	*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/15/2004*	*8/3/2005*
	USEPA Regional Screening Levels																													
Parameter	*MCL a*	*TapWater b*																												
Gases																														
Ethane	-	-	U	U	-	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-
Ethene	-	-	U	U	-	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-
Methane	-	-	U	0.0006	-	-	-	-	-	-	-	-	0.0014	0.0006	-	-	-	-	-	-	-	0.0005	0.004	-	-	-	-	-	-	-
General Chemistry																														
Alkalinity, total (as CaCO3)	-	-	290	220	-	-	-	-	-	-	-	-	460	310	-	-	-	-	-	-	-	380	270	-	-	-	-	-	-	-
Ammonia-N	-	-	U	U	-	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-
Chloride	-	-	32	32.7	-	-	-	-	-	-	-	-	95.1	80.5	-	-	-	-	-	-	-	145	121	-	-	-	-	-	-	-
Nitrate (as N)	10	58	4.6	8.9	-	-	-	-	-	-	-	-	0.65	1.1	-	-	-	-	-	-	-	2.1	2.3	-	-	-	-	-	-	-
Sulfate	-	-	41.9	45.4	-	-	-	-	-	-	-	-	50.2	47	-	-	-	-	-	-	-	72.2	66.5	-	-	-	-	-	-	-
Total organic carbon (TOC)	-	-	U	2	-	-	-	-	-	-	-	-	U	1	-	-	-	-	-	-	-	U	2	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).

B - Compound is found in the associated blank as well as in the sample (Organics).

D - Result was obtained from the analysis of a dilution.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.

J - Indicates an estimated value.

P - Indicates there is a greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported.

U - Compound was analyzed for but not detected.

-- Not applicable.

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*
Sample ID:			*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*
Sample Date:			*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/4/2005*	*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*
	USEPA Regional Screening Levels																												
Parameter	*MCL a*	*TapWater b*																											
Volatiles																													
1,1,1-Trichloroethane	0.2	9.1	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	-	0.000067	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	0.005	0.00024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	0.0024	U	0.001 J	0.013[b]	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethene	0.007	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	-	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.005	0.00015	0.005[b]	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,2-Dichloroethene (total)	-	0.33	U	0.008	0.025	U	U	U	0.014	0.021	0.011	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,2-Dichloropropane	0.005	0.00039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	-	0.047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	-	22	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Benzene	0.005	0.00041	U	0.0007[b]	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromodichloromethane	-	0.00012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	-	0.0085	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromomethane (Methyl bromide)	-	0.0087	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	0.005	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.1	0.091	0.026	0.024	0.019	0.027	0.029	0.029	0.012	0.012	0.0099	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroethane	-	21	U	0.003 J	U	U	U	U	U	U	U	0.0029 J	0.002 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroform (Trichloromethane)	-	0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl chloride)	-	0.19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	0.07	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	0.00015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.7	0.0015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m&p-Xylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	0.005	0.0048	U	0.003 J	U	U	U	U	U	U	U	U	0.002 J	0.0058 B[ab]	U	U	U	U	U	U	0.0005 J	U	U	U	U	U	U	U
o-Xylene	-	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.1	1.6	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetrachloroethene	0.005	0.00011	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Toluene	1	2.3	0.0049 J	0.005	0.0084	U	U	U	U	U	U	0.0043 J	0.006	U	U	U	U	U	U	U	0.0006 J	U	U	U	U	U	U	U	U
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.005	0.002	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Vinyl chloride	0.002	0.000016	U	0.002 J[b]	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Xylene (total)	10	0.2	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Semi-Volatiles																													
1,2,4-Trichlorobenzene	0.07	0.0023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	0.6	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	0.075	0.00043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	0.0061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	0.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	0.073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.00022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	0.037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3-Dichlorobenzidine	-	0.00015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*
Sample ID:			*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*
Sample Date:			*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/4/2005*	*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*
	USEPA Regional Screening Levels																											
Parameter	*MCL a*	*TapWater b*																										
Semi-Volatiles (continued)																												
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	0.0037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	-	0.00034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	0.0034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	0.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.000012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	0.035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	0.037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.00086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	0.05	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	0.0048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	0.071	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.00014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.00012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0000096	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	0.001	0.00056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*
Sample ID:			*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*
Sample Date:			*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/4/2005*	*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*
	USEPA Regional Screening Levels																												
Parameter	*MCL a*	*TapWater b*																											
Metals																													
Aluminum	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	0.006	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	0.01	0.000045	0.019[ab]	0.027[ab]	-	-	-	-	-	-	-	0.033[ab]	0.028[ab]	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-
Barium	2	7.3	U	U	-	-	-	-	-	-	-	0.85	0.7	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-
Beryllium	0.004	0.073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	0.005	0.018	U	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-
Calcium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	-	-	U	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	0.024	-	-	-	-	-	-	-	-
Cobalt	-	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	1.3	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	0.2	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (dissolved)	-	26	2.1	4.2	-	-	-	-	-	-	-	3.1	3.1	-	-	-	-	-	-	-	2.5	-	-	-	-	-	-	-	-
Lead	0.015	-	U	U	-	-	-	-	-	-	-	0.0049	U	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-
Magnesium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	0.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	0.002	0.00057	U	-	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	-	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	0.05	0.18	U	-	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	-	0.18	U	-	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]lium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]llium	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs																													
Aroclor-1016 (PCB-1016)	-	0.00096	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	0.0000068	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	-	0.0000068	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides																													
4,4'-DDD	-	0.00028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	-	0.000004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	-	0.000011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
beta-BHC	-	0.000037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	-	0.0000042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	0.002	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (lindane)	0.0002	0.000061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	0.0004	0.000015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	0.0002	0.0000074	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	0.04	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]aphene	0.003	0.000061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-203*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-204*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*	*MW-206*
Sample ID:			*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW203*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW204*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*	*MW206*
Sample Date:			*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/4/2005*	*5/28/1998*	*2/17/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*
	USEPA Regional Screening Levels																												
Parameter	*MCL a*	*TapWater b*																											
Gases																													
Ethane	-	-	0.02 E/0.018 D	0.023	-	-	-	-	-	-	-	0.016	0.021	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-
Ethene	-	-	0.00058	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-
Methane	-	-	0.91 E/0.28 E	1.5 D/0.33 E	-	-	-	-	-	-	-	5.7 D/0.037 E	2.2 D/0.54 E	-	-	-	-	-	-	-	0.0018	-	-	-	-	-	-	-
General Chemistry																													
Alkalinity, total (as CaCO3)	-	-	540	430	-	-	-	-	-	-	-	800	470	-	-	-	-	-	-	-	350	-	-	-	-	-	-	-
Ammonia-N	-	-	3.3	2.9	-	-	-	-	-	-	-	5.4	4.4	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-
Chloride	-	-	75.5	67.1	-	-	-	-	-	-	-	56.2	59.2	-	-	-	-	-	-	-	28	-	-	-	-	-	-	-
Nitrate (as N)	10	58	U	U	-	-	-	-	-	-	-	U	U	-	-	-	-	-	-	-	10	-	-	-	-	-	-	-
Sulfate	-	-	34.5	33.6	-	-	-	-	-	-	-	1.3	1.5	-	-	-	-	-	-	-	54.4	-	-	-	-	-	-	-
Total organic carbon (TOC)	-	-	7	11	-	-	-	-	-	-	-	8	9	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).
B - Compound is found in the associated blank as well as in the sample (Organics).
D - Result was obtained from the analysis of a dilution.
E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.
J - Indicates an estimated value.
P - Indicates there is a greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported.
U - Compound was analyzed for but not detected.
-- Not applicable.

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-210*	*MW-210*	*MW-210*
Sample ID:			*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW210*	*MW210*	*MW210*
Sample Date:			*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*	*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/3/2005*	*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/18/1999*	*11/11/1999*	*5/10/2000*
	USEPA Regional Screening Levels																												
Parameter	*MCL a*	*TapWater b*																											
Volatiles																													
1,1,1-Trichloroethane	0.2	9.1	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2,2-Tetrachloroethane	-	0.000067	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1,2-Trichloroethane	0.005	0.00024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	0.0024	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,1-Dichloroethene	0.007	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	-	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	0.005	0.00015	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
1,2-Dichloroethene (total)	-	0.33	U	U	U	U	U	U	U	U	0.002 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.016	0.045	0.014
1,2-Dichloropropane	0.005	0.00039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	-	0.047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	-	22	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Benzene	0.005	0.00041	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromodichloromethane	-	0.00012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	-	0.0085	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Bromomethane (Methyl bromide)	-	0.0087	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	0.005	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.1	0.091	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroethane	-	21	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Chloroform (Trichloromethane)	-	0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl chloride)	-	0.19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	0.07	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	0.00015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.7	0.0015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
m&p-Xylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methylene chloride	0.005	0.0048	0.003 J	U	U	U	U	U	U	U	0.0008 J	U	U	U	U	U	U	U	0.008 B[ab]	0.051 B[ab]	U	U	U	U	U	U	0.0007 J	0.014 B[ab]	U
o-Xylene	-	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Styrene	0.1	1.6	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Tetrachloroethene	0.005	0.00011	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Toluene	1	2.3	0.004 J	U	U	U	U	U	U	U	0.002 J	U	U	U	U	U	U	U	0.007	U	U	U	U	U	U	U	0.0017 J	U	U
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.005	0.002	U	U	U	U	U	U	U	U	0.002 J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.087[ab]	0.26[ab]	0.058[ab]
Vinyl chloride	0.002	0.000016	U	U	U	U	U	U	U	U	0.001 J[b]	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Xylene (total)	10	0.2	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Semi-Volatiles																													
1,2,4-Trichlorobenzene	0.07	0.0023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	0.6	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	0.075	0.00043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	0.0061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	0.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	0.073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.00022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	0.037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3-Dichlorobenzidine	-	0.00015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-210*	*MW-210*	*MW-210*
Sample ID:			*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW210*	*MW210*	*MW210*
Sample Date:			*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*	*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/3/2005*	*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/18/1999*	*11/11/1999*	*5/10/2000*
	USEPA Regional Screening Levels																												
Parameter	*MCL a*	*TapWater b*																											
Semi-Volatiles (continued)																													
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	0.0037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	-	0.00034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	0.0034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	0.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.000012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	0.035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	0.037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.00086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	0.05	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	0.0048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	0.071	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.00014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.00012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0000096	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	0.001	0.00056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-210*	*MW-210*	*MW-210*
Sample ID:			*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW210*	*MW210*	*MW210*
Sample Date:			*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*	*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/3/2005*	*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/18/1999*	*11/11/1999*	*5/10/2000*
	USEPA Regional Screening Levels																												
Parameter	*MCL a*	*TapWater b*																											
Metals																													
Aluminum	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	0.006	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	0.01	0.000045	0.012[ab]	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	0.032[ab]	-	-	-	-	-	-	-	U	-	-
Barium	2	7.3	U	-	-	-	-	-	-	-	0.23	-	-	-	-	-	-	-	0.63	-	-	-	-	-	-	-	U	-	-
Beryllium	0.004	0.073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	0.005	0.018	U	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	U	-	-
Calcium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	-	-	U	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	0.065	-	-	-	-	-	-	-	0.034	-	-
Cobalt	-	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	1.3	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	0.2	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (dissolved)	-	26	2.5	-	-	-	-	-	-	-	1.3	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	2.7	-	-
Lead	0.015	-	U	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	0.1[a]	-	-	-	-	-	-	-	U	-	-
Magnesium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	0.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	0.002	0.00057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	-	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	0.05	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]ium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]llium	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs																													
Aroclor-1016 (PCB-1016)	-	0.00096	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	0.0000068	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	-	0.0000068	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides																													
4,4'-DDD	-	0.00028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	-	0.000004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	-	0.000011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
beta-BHC	-	0.000037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	-	0.0000042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	0.002	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (lindane)	0.0002	0.000061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	0.0004	0.000015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	0.0002	0.0000074	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	0.04	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]phene	0.003	0.000061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-207*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-208*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-209*	*MW-210*	*MW-210*	*MW-210*
Sample ID:			*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW207*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW208*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW209*	*MW210*	*MW210*	*MW210*
Sample Date:			*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/2/2005*	*2/18/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/14/2004*	*8/3/2005*	*2/22/1999*	*11/11/1999*	*5/9/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/18/1999*	*11/11/1999*	*5/10/2000*
	USEPA Regional Screening Levels																												
Parameter	*MCL a*	*TapWater b*																											
Gases																													
Ethane	-	-	0.0014	-	-	-	-	-	-	-	0.002	-	-	-	-	-	-	-	0.004	-	-	-	-	-	-	-	0.001	-	-
Ethene	-	-	U	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	U	-	-
Methane	-	-	0.0047	-	-	-	-	-	-	-	0.059	-	-	-	-	-	-	-	0.28 E/0.59 D	-	-	-	-	-	-	-	0.082 D/0.088 E	-	-
General Chemistry																													
Alkalinity, total (as CaCO3)	-	-	350	-	-	-	-	-	-	-	500	-	-	-	-	-	-	-	340	-	-	-	-	-	-	-	510	-	-
Ammonia-N	-	-	U	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	U	-	-
Chloride	-	-	19.5	-	-	-	-	-	-	-	111	-	-	-	-	-	-	-	39.1	-	-	-	-	-	-	-	198	-	-
Nitrate (as N)	10	58	8.4	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	0.9	-	-
Sulfate	-	-	46.1	-	-	-	-	-	-	-	59.6	-	-	-	-	-	-	-	78	-	-	-	-	-	-	-	58.9	-	-
Total organic carbon (TOC)	-	-	5	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	2	-	-

Notes:
All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).

B - Compound is found in the associated blank as well as in the sample (Organics).

D - Result was obtained from the analysis of a dilution.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.

J - Indicates an estimated value.

P - Indicates there is a greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported.

U - Compound was analyzed for but not detected.

-- Not applicable.

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-210*	*MW-210*	*MW-210*	*MW-210*	*MW-210*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*SD001*	*SD001*	*SD002*	*SD002*	*SD004A*	*SD004A*	*SD004A*	*SD005*	*SD005*
Sample ID:			*MW210*	*MW210*	*MW210*	*MW210*	*MW210*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*SDGW001*	*SDGW004*	*SDGW002*	*SDGW003*	*SDGW005*	*SDGW006*	*SDGW007*	*SDGW008*	*SDGW009*
Sample Date:			6/6/2001	6/14/2002	7/1/2004	10/15/2004	8/4/2005	2/18/1999	11/11/1999	5/10/2000	6/6/2001	6/14/2002	7/2/2004	10/14/2004	8/3/2005	2/19/1996	2/21/1996	2/20/1996	2/20/1996	2/23/1996	2/23/1996	2/23/1996	2/26/1996	2/26/1996
	USEPA Regional Screening Levels																					*Duplicate*		
Parameter	*MCL a*	*TapWater b*																						
Volatiles																								
1,1,1-Trichloroethane	0.2	9.1	U	U	U	U	U	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	-	0.000067	U	U	U	U	U	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	0.005	0.00024	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	0.0024	U	U	U	U	U	U	U	U	U	U	U	U	U	0.0005	0.0008	0.0012	0.0028[b]	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
1,1-Dichloroethene	0.007	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	-	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0006	0.0005 U	0.0005 U	0.0005 U	0.0005
1,2-Dichloroethane	0.005	0.00015	U	U	U	U	U	U	U	U	U	U	U	U	U	0.0005 U	0.0009[b]	0.0005[b]	0.0005 U	0.0009[b]	0.0005 U	0.0008[b]	0.0005 U	0.0005 U
1,2-Dichloroethene (total)	-	0.33	U	0.013	0.041	0.045	0.033	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	0.005	0.00039	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Hexanone	-	0.047	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetone	-	22	U	U	U	U	U	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
Benzene	0.005	0.00041	U	U	U	U	U	U	U	U	U	U	U	U	U	0.0012[b]	0.0009[b]	0.0008[b]	0.0019[b]	0.0008[b]	0.0006[b]	0.0005[b]	0.0007[b]	0.0016[b]
Bromodichloromethane	-	0.00012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bromoform	-	0.0085	U	U	U	U	U	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
Bromomethane (Methyl bromide)	-	0.0087	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon disulfide	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	0.005	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	0.1	0.091	U	U	U	U	U	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
Chloroethane	-	21	U	U	U	U	U	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
Chloroform (Trichloromethane)	-	0.00019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloromethane (Methyl chloride)	-	0.19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
cis-1,2-Dichloroethene	0.07	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0005 U	0.0005 U	0.0009	0.0016	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
cis-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	0.00015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	0.7	0.0015	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0008	0.0005 U	0.0005 U	0.0006	0.0007
m&p-Xylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00005 U	0.0005 U	0.0006	0.0005 U	0.0012	0.0007	0.0007	0.0009	0.0009
Methylene chloride	0.005	0.0048	U	U	U	U	U	U	0.0054 B[ab]	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
o-Xylene	-	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005	0.0005 U	0.0005 U	0.0005 U	0.0007
Styrene	0.1	1.6	U	U	U	U	U	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
Tetrachloroethene	0.005	0.00011	U	U	U	U	U	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
Toluene	1	2.3	U	U	U	U	U	0.002 J	0.0058	0.0066	U	U	U	U	U	0.0015	0.0015	0.0019	0.0023	0.0024	0.0015	0.0015	0.0021	0.0029
trans-1,3-Dichloropropene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	0.005	0.002	0.03[ab]	0.076[ab]	0.17[ab]	0.25[ab]	0.19[ab]	U	U	U	U	U	U	U	U	0.0046[b]	0.0028[b]	0.0005 U	0.0005 U	0.0015	0.0020	0.0022[b]	0.0005 U	0.0024[b]
Vinyl chloride	0.002	0.000016	U	U	U	U	U	U	U	U	U	U	U	U	U	0.0005 U	0.0005 U	0.0005 U	0.0009[b]	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U
Xylene (total)	10	0.2	U	U	U	U	U	U	U	U	U	U	U	U	U	-	-	-	-	-	-	-	-	-
Semi-Volatiles																								
1,2,4-Trichlorobenzene	0.07	0.0023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	0.6	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	0.075	0.00043	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	0.0061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	0.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	0.073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.00022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	0.037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.00015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-210*	*MW-210*	*MW-210*	*MW-210*	*MW-210*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*SD001*	*SD001*	*SD002*	*SD002*	*SD004A*	*SD004A*	*SD004A*	*SD005*	*SD005*
Sample ID:			*MW210*	*MW210*	*MW210*	*MW210*	*MW210*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*SDGW001*	*SDGW004*	*SDGW002*	*SDGW003*	*SDGW005*	*SDGW006*	*SDGW007*	*SDGW008*	*SDGW009*
Sample Date:			*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/15/2004*	*8/4/2005*	*2/18/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/19/1996*	*2/21/1996*	*2/20/1996*	*2/20/1996*	*2/23/1996*	*2/23/1996*	*2/23/1996*	*2/26/1996*	*2/26/1996*
	USEPA Regional Screening Levels																					*Duplicate*		
Parameter	*MCL a*	*TapWater b*																						
Semi-Volatiles (continued)																								
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	0.0037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	-	0.00034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	0.0034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.0002	0.0000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.00029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	0.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.000012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	0.006	0.0048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	0.035	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	0.037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	0.001	0.000042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.00086	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	0.05	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	0.0048	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.000029	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	0.071	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.00014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.00012	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0000096	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	0.014	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	0.001	0.00056	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-210*	*MW-210*	*MW-210*	*MW-210*	*MW-210*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*SD001*	*SD001*	*SD002*	*SD002*	*SD004A*	*SD004A*	*SD004A*	*SD005*	*SD005*
Sample ID:			*MW210*	*MW210*	*MW210*	*MW210*	*MW210*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*SDGW001*	*SDGW004*	*SDGW002*	*SDGW003*	*SDGW005*	*SDGW006*	*SDGW007*	*SDGW008*	*SDGW009*
Sample Date:			*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/15/2004*	*8/4/2005*	*2/18/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/19/1996*	*2/21/1996*	*2/20/1996*	*2/20/1996*	*2/23/1996*	*2/23/1996*	*2/23/1996*	*2/26/1996*	*2/26/1996*
	USEPA Regional Screening Levels																					*Duplicate*		
Parameter	*MCL a*	*TapWater b*																						
Metals																								
Aluminum	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antimony	0.006	0.015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	0.01	0.000045	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Barium	2	7.3	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beryllium	0.004	0.073	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	0.005	0.018	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	-	-	-	-	-	-	-	0.013	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cobalt	-	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Copper	1.3	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyanide (total)	0.2	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	-	26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron (dissolved)	-	26	-	-	-	-	-	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Lead	0.015	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Magnesium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	-	0.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	0.002	0.00057	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	-	0.73	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Potassium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	0.05	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Silver	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Thallium	0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vanadium	-	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PCBs																								
Aroclor-1016 (PCB-1016)	-	0.00096	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	-	0.0000068	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	-	0.0000068	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	-	0.000034	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pesticides																								
4,4'-DDD	-	0.00028	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	-	0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	-	0.000004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	-	0.000011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
beta-BHC	-	0.000037	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	-	0.0000042	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	0.002	0.011	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (lindane)	0.0002	0.000061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	0.0004	0.000015	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	0.0002	0.0000074	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	0.04	0.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene	0.003	0.000061	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A1.3

HISTORIC GROUNDWATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-210*	*MW-210*	*MW-210*	*MW-210*	*MW-210*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*MW-212*	*SD001*	*SD001*	*SD002*	*SD002*	*SD004A*	*SD004A*	*SD004A*	*SD005*	*SD005*
Sample ID:			*MW210*	*MW210*	*MW210*	*MW210*	*MW210*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*MW212*	*SDGW001*	*SDGW004*	*SDGW002*	*SDGW003*	*SDGW005*	*SDGW006*	*SDGW007*	*SDGW008*	*SDGW009*
Sample Date:			*6/6/2001*	*6/14/2002*	*7/1/2004*	*10/15/2004*	*8/4/2005*	*2/18/1999*	*11/11/1999*	*5/10/2000*	*6/6/2001*	*6/14/2002*	*7/2/2004*	*10/14/2004*	*8/3/2005*	*2/19/1996*	*2/21/1996*	*2/20/1996*	*2/20/1996*	*2/23/1996*	*2/23/1996*	*2/23/1996*	*2/26/1996*	*2/26/1996*
	USEPA Regional Screening Levels																					*Duplicate*		
Parameter	*MCL*	*TapWater*																						
	a	*b*																						
Gases																								
Ethane	-	-	-	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ethene	-	-	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methane	-	-	-	-	-	-	-	0.3 E/1.3 D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry																								
Alkalinity, total (as CaCO3)	-	-	-	-	-	-	-	270	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ammonia-N	-	-	-	-	-	-	-	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	-	-	-	-	-	-	-	96.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrate (as N)	10	58	-	-	-	-	-	U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sulfate	-	-	-	-	-	-	-	94.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total organic carbon (TOC)	-	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).
B - Compound is found in the associated blank as well as in the sample (Organics).
D - Result was obtained from the analysis of a dilution.
E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.
J - Indicates an estimated value.
P - Indicates there is a greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported.
U - Compound was analyzed for but not detected.
-- Not applicable.

TABLE A1.4

HISTORIC SURFACE WATER ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*SW-1-99*	*SW-1-00*	*SW-2-99*	*SW-2-00*	*SW-3-99*	*SW-3-00*
Sample ID:			*SW-1*	*SW-1*	*SW-2*	*SW-2*	*SW-3*	*SW-3*
Sample Date:			*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*	*4/16/1999*	*5/12/2000*
Sampling Company:			*Payne*	*Payne*	*Payne*	*Payne*	*Payne*	*Payne*
	USEPA Regional Screening Levels							
Parameter	*MCL* *a*	*TapWater* *b*						
Volatiles								
1,1,1-Trichloroethane	0.2	9.1	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1,2,2-Tetrachloroethane	-	0.000067	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1,2-Trichloroethane	0.005	0.00024	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1-Dichloroethane	-	0.0024	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1-Dichloroethene	0.007	0.34	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloroethane	0.005	0.00015	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloroethene (total)	-	0.33	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloropropane	0.005	0.00039	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7.1	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
2-Hexanone	-	0.047	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone	-	22	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Benzene	0.005	0.00041	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromodichloromethane	-	0.00012	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromoform	-	0.0085	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromomethane (Methyl bromide)	-	0.0087	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon disulfide	-	1	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Carbon tetrachloride	0.005	0.0002	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chlorobenzene	0.1	0.091	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chloroethane	-	21	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform (Trichloromethane)	-	0.00019	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chloromethane (Methyl chloride)	-	0.19	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	-	-	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Dibromochloromethane	-	0.00015	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Ethylbenzene	0.7	0.0015	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Methylene chloride	0.005	0.0048	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Styrene	0.1	1.6	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Tetrachloroethene	0.005	0.00011	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Toluene	1	2.3	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
trans-1,3-Dichloropropene	-	-	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Trichloroethene	0.005	0.002	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Vinyl chloride	0.002	0.000016	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Xylene (total)	10	0.2	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U

Notes:
All concentrations are expressed in units of milligrams per litre (mg/L) unless otherwise noted.

U - Compound was analyzed for but not detected.

TABLE A1.5

HISTORIC SEDIMENT ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S15(OEPA)*	*S16(OEPA)*	*S17(OEPA)*	*S17(OEPA)*	*S18(OEPA)*	*S19(OEPA)*	*SED-1*	*SED-2*	*SED-3*	*SEDIMENT-1*	*SEDIMENT-2*	*SEDIMENT-3*
Sample ID:			*96-DV-03-S15*	*96-DV-03-S16*	*96-DV-03-S17*	*96-DV-03-D17*	*96-DV-03-S18*	*96-DV-03-S19*	*SED-1*	*SED-2*	*SED-3*	*SEDIMENT-1*	*SEDIMENT-2*	*SEDIMENT-3*
Sample Date:			*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*5/12/2000*	*5/12/2000*	*5/12/2000*	*4/16/1999*	*4/16/1999*	*4/16/1999*
Sample Depth:			*15-18 ft BGS*	*15-18 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	-	-	-	-	-	-
						Duplicate								
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*												
Volatiles														
1,1,1-Trichloroethane	8700	38000	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1,2,2-Tetrachloroethane	0.56	2.8	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1,2-Trichloroethane	1.1	5.3	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1-Dichloroethane	3.3	17	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,1-Dichloroethene	240	1100	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloroethane	0.43	2.2	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloroethene (total)	700	9200	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
1,2-Dichloropropane	0.89	4.5	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
2-Butanone (Methyl ethyl ketone) (MEK)	28000	200000	0.026 U	0.01 J	0.015 U	0.014 U	0.005 J	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
2-Hexanone	210	1400	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	5300	53000	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Acetone	61000	630000	0.047	0.043	0.015 U	0.014 U	0.033	0.019	0.02 U	0.02 U	0.037	0.02 U	0.02 U	0.02 U
Benzene	1.1	5.4	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromodichloromethane	0.27	1.4	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromoform	61	220	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Bromomethane (Methyl bromide)	7.3	32	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carbon disulfide	820	3700	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Carbon tetrachloride	0.25	1.2	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chlorobenzene	290	1400	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chloroethane	15000	61000	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chloroform (Trichloromethane)	0.29	1.5	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Chloromethane (Methyl chloride)	120	500	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
cis-1,3-Dichloropropene	-	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Dibromochloromethane	0.68	3.3	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Ethylbenzene	5.4	27	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Methylene chloride	11	53	0.026 BJU	0.029 BJU	0.015 BJU	0.014 BJU	0.018 BJU	0.018 BJU	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Styrene	6300	36000	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Tetrachloroethene	0.55	2.6	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Toluene	5000	45000	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.001 J	0.0050 U	0.0050 U	0.014	0.0050 U	0.0050 U	0.0050 U
trans-1,3-Dichloropropene	-	-	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Trichloroethene	2.8	14	0.0008 J	0.029 U	0.0007 J	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Vinyl chloride	0.06	1.7	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Xylene (total)	630	2700	0.026 U	0.029 U	0.015 U	0.014 U	0.018 U	0.018 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
Semi-Volatiles														
1,2,4-Trichlorobenzene	22	99	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
1,2-Dichlorobenzene	1900	9800	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
1,3-Dichlorobenzene	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
1,4-Dichlorobenzene	2.4	12	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,4,5-Trichlorophenol	6100	62000	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
2,4,6-Trichlorophenol	44	160	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,4-Dichlorophenol	180	1800	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,4-Dimethylphenol	1200	12000	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,4-Dinitrophenol	120	1200	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
2,4-Dinitrotoluene	1.6	5.5	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2,6-Dinitrotoluene	61	620	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-

TABLE A1.5

HISTORIC SEDIMENT ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S15(OEPA)*	*S16(OEPA)*	*S17(OEPA)*	*S17(OEPA)*	*S18(OEPA)*	*S19(OEPA)*	*SED-1*	*SED-2*	*SED-3*	*SEDIMENT-1*	*SEDIMENT-2*	*SEDIMENT-3*
Sample ID:			*96-DV-03-S15*	*96-DV-03-S16*	*96-DV-03-S17*	*96-DV-03-D17*	*96-DV-03-S18*	*96-DV-03-S19*	*SED-1*	*SED-2*	*SED-3*	*SEDIMENT-1*	*SEDIMENT-2*	*SEDIMENT-3*
Sample Date:			*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*5/12/2000*	*5/12/2000*	*5/12/2000*	*4/16/1999*	*4/16/1999*	*4/16/1999*
Sample Depth:			*15-18 ft BGS*	*15-18 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	-	-	-	-	-	-
						Duplicate								
Parameter	*Residential Soil Criteria* *a*	*Industrial Soil Criteria* *b*												
2-Chloronaphthalene	6300	82000	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2-Chlorophenol	390	5100	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2-Methylnaphthalene	310	4100	0.12 J	0.075 J	0.023 J	0.019 J	0.016 J	0.031 J	-	-	-	-	-	-
2-Methylphenol	3100	31000	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
2-Nitroaniline	610	6000	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
2-Nitrophenol	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
3,3'-Dichlorobenzidine	1.1	3.8	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
3-Nitroaniline	-	-	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	6.1	62	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Chloro-3-methylphenol	6100	62000	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Chloroaniline	2.4	8.6	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Methylphenol	310	3100	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
4-Nitroaniline	24	86	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
4-Nitrophenol	-	-	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
Acenaphthene	3400	39000	0.059 J	0.092 J	0.021 J	0.013 J	0.04 J	0.089 J	-	-	-	-	-	-
Acenaphthylene	-	-	0.85 U	0.061 J	0.16 J	0.15 J	0.014 J	0.022 J	-	-	-	-	-	-
Anthracene	17000	170000	0.11 J	0.23 J	0.4 J	0.39 J	0.075 J	0.17 J	-	-	-	-	-	-
Benzo(a)anthracene	0.15	2.1	0.49 J*	1.5*	2.2**	2.1*	0.6*	1.3*	-	-	-	-	-	-
Benzo(a)pyrene	0.015	0.21	0.46 J**	1.8**	2.1**	2.1**	0.58**	1.1**	-	-	-	-	-	-
Benzo(b)fluoranthene	0.15	2.1	0.8 J*	2.5**	2.7**	2.3**	1*	1.8*	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	0.49 J	2	2.2	1.6	0.66	1.4	-	-	-	-	-	-
Benzo(k)fluoranthene	1.5	21	0.3 J	0.95	0.93	0.93	0.41 J	0.69	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	180	1800	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
bis(2-Chloroethyl)ether	0.21	1	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	35	120	0.85 U	0.47 J	0.5 U	0.084 J	0.33 J	0.36 J	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	260	910	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.084 J	-	-	-	-	-	-
Carbazole	-	-	0.085 J	0.11 J	0.02 J	0.015 J	0.084 J	0.19 J	-	-	-	-	-	-
Chrysene	15	210	0.55 J	1.5	2.5	2.1	0.71	1.5	-	-	-	-	-	-
Dibenz(a,h)anthracene	0.015	0.21	0.12 J*	0.48 J**	0.43 J**	0.32 J**	0.15 J*	0.31 J**	-	-	-	-	-	-
Dibenzofuran	78	1000	0.07 J	0.095 J	0.011 J	0.007 J	0.034 J	0.1 J	-	-	-	-	-	-
Diethyl phthalate	49000	490000	0.85 U	0.039 J	0.024 J	0.027 J	0.051 J	0.033 J	-	-	-	-	-	-
Dimethyl phthalate	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	6100	62000	0.85 BJU	0.94 BJU	0.5 BJU	0.46 BJU	0.58 BJU	0.6 BJU	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Fluoranthene	2300	22000	1.1	2.6	2	2	1.4	2.2	-	-	-	-	-	-
Fluorene	2300	22000	0.076 J	0.16 J	0.053 J	0.043 J	0.06 J	0.13 J	-	-	-	-	-	-
Hexachlorobenzene	0.3	1.1	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Hexachlorobutadiene	6.2	22	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Hexachlorocyclopentadiene	370	3700	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Hexachloroethane	35	120	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	0.15	2.1	0.46 J*	1.9*	1.9*	1.6*	0.65*	1.4*	-	-	-	-	-	-
Isophorone	510	1800	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Naphthalene	3.6	18	0.07 J	0.077 J	0.031 J	0.025 J	0.018 J	0.063 J	-	-	-	-	-	-
Nitrobenzene	4.8	24	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-

TABLE A1.5

HISTORIC SEDIMENT ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S15(OEPA)*	*S16(OEPA)*	*S17(OEPA)*	*S17(OEPA)*	*S18(OEPA)*	*S19(OEPA)*	*SED-1*	*SED-2*	*SED-3*	*SEDIMENT-1*	*SEDIMENT-2*	*SEDIMENT-3*
Sample ID:			*96-DV-03-S15*	*96-DV-03-S16*	*96-DV-03-S17*	*96-DV-03-D17*	*96-DV-03-S18*	*96-DV-03-S19*	*SED-1*	*SED-2*	*SED-3*	*SEDIMENT-1*	*SEDIMENT-2*	*SEDIMENT-3*
Sample Date:			*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*5/12/2000*	*5/12/2000*	*5/12/2000*	*4/16/1999*	*4/16/1999*	*4/16/1999*
Sample Depth:			*15-18 ft BGS*	*15-18 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	-	-	-	-	-	-
						Duplicate								
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*												
N-Nitrosodi-n-propylamine	0.069	0.25	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
N-Nitrosodiphenylamine	99	350	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Pentachlorophenol	3	9	2.1 U	2.4 U	1.3 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
Phenanthrene	-	-	0.89	1.5	0.7	0.61	0.83	1.9	-	-	-	-	-	-
Phenol	18000	180000	0.85 U	0.94 U	0.5 U	0.46 U	0.58 U	0.6 U	-	-	-	-	-	-
Pyrene	1700	17000	1.3	3	4.7 E	3.7 E	1.4	2.7	-	-	-	-	-	-
Metals														
Aluminum	77000	990000	2750	6590	9750	8450	8940	8600	-	-	-	-	-	-
Antimony	31	410	9.1 U	13.5 U	7.9 U	8.1 U	10 U	10.1 U	-	-	-	-	-	-
Arsenic	0.39	1.6	10.3[ab]	12.6[ab]	9.2[ab]	9.2[ab]	6.0[ab]	9[ab]	-	-	-	-	-	-
Barium	15000	190000	73.0	137	128	125	117	130	-	-	-	-	-	-
Beryllium	160	2000	0.28 B	0.35 B	0.54 B	0.48 B	0.5 B	0.47 B	-	-	-	-	-	-
Cadmium	70	800	1.0 U	1.5 U	0.89 U	0.91 U	1.1 U	1.1 U	-	-	-	-	-	-
Calcium	-	-	53600	11800	61700	58100	81900	74900	-	-	-	-	-	-
Chromium	-	-	23.1	17.2	14.9	13.7	18	22.3	-	-	-	-	-	-
Cobalt	23	300	3.7 B	6.7 B	6.6 B	6.2 B	6.5 B	7.2 B	-	-	-	-	-	-
Copper	3100	41000	29.3	24.7	29.3	29.0	26	33.5	-	-	-	-	-	-
Cyanide (total)	1600	20000	0.27 B	0.17 U	0.19 B	0.21 B	0.23 B	0.32 B	-	-	-	-	-	-
Iron	55000	720000	11300	13500	16400	15500	15000	15800	-	-	-	-	-	-
Lead	400	800	33.7	42.0	51.6	47.2	30.5	47.9	-	-	-	-	-	-
Magnesium	-	-	13600	21600	17200	16100	24200	20600	-	-	-	-	-	-
Manganese	1800	23000	205	545	299	258	330	420	-	-	-	-	-	-
Mercury	5.6	34	0.08 U	0.12 U	0.63	0.65	0.09 U	0.13 B	-	-	-	-	-	-
Nickel	1500	20000	13.4	18.7 B	16.2	17.9	19.9	23.7	-	-	-	-	-	-
Potassium	-	-	297 B	736 B	812 B	709 B	1090 B	991 B	-	-	-	-	-	-
Selenium	390	5100	1.1 B	0.59 B	0.4 B	0.59 B	0.73 B	0.59 B	-	-	-	-	-	-
Silver	390	5100	1.4 U	2.1 U	1.2 U	1.2 U	1.5 U	1.5 U	-	-	-	-	-	-
Sodium	-	-	165 B	206 B	144 B	131 B	191 B	183 B	-	-	-	-	-	-
Thallium	-	-	0.68 B	0.98 U	1.0 B	0.66 B	0.84 B	0.9 B	-	-	-	-	-	-
Vanadium	390	5200	9.6 B	16.8 B	21.8	19.2	20.2	20	-	-	-	-	-	-
Zinc	23000	310000	80.7	143	93.6 B	80.4	114	132	-	-	-	-	-	-
PCBs														
Aroclor-1016 (PCB-1016)	3.9	21	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	0.14	0.54	0.18 U	0.19 U	0.1 U	0.093 U	0.12 U	0.12 U	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	0.14	0.54	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	0.22	0.74	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	0.22	0.74	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	0.22	0.74	0.66[a]	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	0.22	0.74	0.087 U	0.094 U	0.05 U	0.046 U	0.058 U	0.06 U	-	-	-	-	-	-

TABLE A1.5

HISTORIC SEDIMENT ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*S15(OEPA)*	*S16(OEPA)*	*S17(OEPA)*	*S17(OEPA)*	*S18(OEPA)*	*S19(OEPA)*	*SED-1*	*SED-2*	*SED-3*	*SEDIMENT-1*	*SEDIMENT-2*	*SEDIMENT-3*
Sample ID:			*96-DV-03-S15*	*96-DV-03-S16*	*96-DV-03-S17*	*96-DV-03-D17*	*96-DV-03-S18*	*96-DV-03-S19*	*SED-1*	*SED-2*	*SED-3*	*SEDIMENT-1*	*SEDIMENT-2*	*SEDIMENT-3*
Sample Date:			*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*7/9/1996*	*5/12/2000*	*5/12/2000*	*5/12/2000*	*4/16/1999*	*4/16/1999*	*4/16/1999*
Sample Depth:			*15-18 ft BGS*	*15-18 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	*0-0.5 ft BGS*	-	-	-	-	-	-
	Residential Soil	*Industrial Soil*				*Duplicate*								
Parameter	*Criteria*	*Criteria*												
	a	*b*												
Pesticides														
4,4'-DDD	2	7.2	0.0017 JP	0.0094 U	0.0022 JP	0.0049	0.0034 JP	0.0036 JP	-	-	-	-	-	-
4,4'-DDE	1.4	5.1	0.0087 U	0.0022 JP	0.0050 U	0.0046 U	0.0026 JP	0.0024 JP	-	-	-	-	-	-
4,4'-DDT	1.7	7	0.0044 JP	0.0024 JP	0.0021 JP	0.0022 JP	0.0027 JP	0.0023 JP	-	-	-	-	-	-
Aldrin	0.029	0.1	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0013 JP	-	-	-	-	-	-
alpha-BHC	0.077	0.27	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
alpha-Chlordane	-	-	0.012	0.0018 JP	0.00072 JP	0.0024 U	0.0070 P	0.0066 P	-	-	-	-	-	-
beta-BHC	0.27	0.96	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
delta-BHC	-	-	0.0045 U	0.0049 U	0.0014 JP	0.0015 JP	0.0030 U	0.0031 U	-	-	-	-	-	-
Dieldrin	0.03	0.11	0.0096 P	0.0026 JP	0.00086 JP	0.0046 U	0.0025 JP	0.0040 JP	-	-	-	-	-	-
Endosulfan I	-	-	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
Endosulfan II	-	-	0.0087 U	0.0094 U	0.0050 U	0.0046 U	0.0058 U	0.0060 U	-	-	-	-	-	-
Endosulfan sulfate	-	-	0.0037 JP	0.0094 U	0.0050 U	0.0046 U	0.0030 JP	0.0060 U	-	-	-	-	-	-
Endrin	18	180	0.034	0.0094 U	0.0034 JP	0.0048 P	0.0024 JP	0.0060 U	-	-	-	-	-	-
Endrin aldehyde	-	-	0.0079 JP	0.0094 U	0.0050 U	0.0046 U	0.0058 U	0.0060 U	-	-	-	-	-	-
Endrin ketone	-	-	0.0087 U	0.0049 J	0.0032 JP	0.0040 JP	0.0058 U	0.0025 JP	-	-	-	-	-	-
gamma-BHC (lindane)	0.52	2.1	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
gamma-Chlordane	-	-	0.0049 P	0.0032 J	0.0014 J	0.0024 U	0.0069	0.0056 P	-	-	-	-	-	-
Heptachlor	0.11	0.38	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
Heptachlor epoxide	0.053	0.19	0.0045 U	0.0049 U	0.0026 U	0.0024 U	0.0030 U	0.0031 U	-	-	-	-	-	-
Methoxychlor	310	3100	0.018 J	0.017 JP	0.05	0.065	0.0089 JP	0.012 JP	-	-	-	-	-	-
Toxaphene	0.44	1.6	0.45 U	0.49 U	0.26 U	0.24 U	0.3 U	0.31 U	-	-	-	-	-	-
General Chemistry														
Percent moisture (%)	-	-	-	-	-	-	-	-	15	13	32	13.5	15.0	20.3
Total organic carbon (TOC)	-	-	-	-	-	-	-	-	-	-	-	390	550	100 U

Notes:
All concentrations are expressed in units of milligrams per kilogram (mg/kg) unless otherwise noted.

B - Value is real, but above instrument detection limit and below contract-required detection limit (Inorganics).
B - Compound is found in the associated blank as well as in the sample (Organics).

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument.
J - Indicates an estimated value.

P - Indicates there is a greater than 25% difference for detected concentrations between two GC columns. The lower of the two values is reported.
U - Compound was analyzed for but not detected.
- - Not applicable.

TABLE A4.1

CRA SOIL SAMPLING ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*BH8-09*	*Construction Debris area*	*MW-219*	*NEFormerAirCurtainDestructorFromAshPile*	*NW of MW101A; from ash pile*	*NW of MW101A; from ash pile*	*VAS-4*	*VAS-5*	*VAS-21B*
Sample ID:			*S-38443-062009-DR-002*	*S-038433-071108-GL-004*	*S-38443-120409-DR-001*	*S-034443-071108-GL-001*	*S-038433-071108-GL-002*	*S-038443-071108-GL-003*	*S-38443-110608-KMV-201*	*S-38443-121508-KMV-096*	*S-38443-060209-DR-001*
Sample Date:			*6/20/2009*	*7/11/2008*	*12/4/2009*	*7/11/2008*	*7/11/2008*	*7/11/2008*	*11/6/2008*	*12/15/2008*	*6/2/2009*
Sample Depth:			*3-5 ft BGS*	-	-	-	-	-	*24-25 ft BGS*	*7 ft BGS*	*3-5 ft BGS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*									
Volatiles											
1,1,1-Trichloroethane	8700000	38000000	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
1,1,2,2-Tetrachloroethane	560	2800	6.0 UJ	-	750 U	-	-	-	240 UJ	-	4.3 U
1,1,2-Trichloroethane	1100	5300	8.3	-	750 U	-	-	-	240 UJ	-	4.3 U
1,1-Dichloroethane	3300	17000	0.46 J	-	750 U	-	-	-	240 U	-	4.3 U
1,1-Dichloroethene	240000	1100000	14	-	750 U	-	-	-	240 U	-	4.3 U
1,2,4-Trichlorobenzene	22000	99000	6.0 UJ	-	38 J	-	-	-	240 U	-	4.3 U
1,2-Dibromo-3-chloropropane (DBCP)	5.4	69	12 UJ	-	1500 U	-	-	-	480 U	-	8.6 U
1,2-Dibromoethane (Ethylene dibromide)	34	170	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
1,2-Dichlorobenzene	1900000	9800000	6.0 UJ	-	57 J	-	-	-	190 J	-	4.3 U
1,2-Dichloroethane	430	2200	49	-	750 U	-	-	-	240 U	-	4.3 U
1,2-Dichloropropane	890	4500	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
1,3-Dichlorobenzene	-	-	6.0 UJ	-	750 U	-	-	-	240 U	-	4.3 U
1,4-Dichlorobenzene	2400	12000	6.0 UJ	-	750 U	-	-	-	45 J	-	4.3 U
2-Butanone (Methyl ethyl ketone) (MEK)	28000000	200000000	2.8 J	-	3000 U	-	-	-	970 U	-	17 U
2-Hexanone	210000	1400000	24 U	-	3000 U	-	-	-	970 U	-	17 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	5300000	53000000	24 U	-	3000 U	-	-	-	970 UJ	-	17 U
Acetone	61000000	630000000	24 UJ	-	3000 U	-	-	-	970 U	-	17 U
Benzene	1100	5400	1.5 J	-	750 U	-	-	-	240 U	-	4.3 U
Bromodichloromethane	270	1400	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Bromoform	61000	220000	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Bromomethane (Methyl bromide)	7300	32000	6.0 U	-	750 U	-	-	-	240 UJ	-	4.3 U
[illegible]rbon disulfide	820000	3700000	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
[illegible]bon tetrachloride	250	1200	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
[illegible]lorobenzene	290000	1400000	6.0 U	-	51 J	-	-	-	240 U	-	4.3 U
Chloroethane	15000000	61000000	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Chloroform (Trichloromethane)	290	1500	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Chloromethane (Methyl chloride)	120000	500000	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
cis-1,2-Dichloroethene	780000	10000000	7.4	-	750 U	-	-	-	240 U	-	4.3 U
cis-1,3-Dichloropropene	-	-	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Cyclohexane	7000000	29000000	12 UJ	-	56 J	-	-	-	480 U	-	8.6 U
Dibromochloromethane	680	3300	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Dichlorodifluoromethane (CFC-12)	180000	780000	6.0 U	-	750 UJ	-	-	-	240 U	-	4.3 U
Ethylbenzene	5400	27000	6.0 U	-	44 J	-	-	-	240 U	-	4.3 U
Isopropyl benzene	2100000	11000000	6.0 U	-	1800	-	-	-	240 U	-	4.3 U
Methyl acetate	78000000	1000000000	12 U	-	1500 U	-	-	-	480 U	-	8.6 U
Methyl cyclohexane	-	-	4.9 J	-	2800	-	-	-	230 J	-	8.6 U
Methyl tert butyl ether (MTBE)	43000	220000	24 U	-	3000 U	-	-	-	970 U	-	17 U
Methylene chloride	11000	53000	0.84 J	-	750 U	-	-	-	240 U	-	4.3 U
Styrene	6300000	36000000	6.0 U	-	750 U	-	-	-	240 UJ	-	4.3 U
Tetrachloroethene	550	2600	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Toluene	5000000	45000000	2.1 J	-	750 U	-	-	-	240 U	-	4.3 U
trans-1,2-Dichloroethene	150000	690000	0.95 J	-	750 U	-	-	-	240 U	-	4.3 U
trans-1,3-Dichloropropene	-	-	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Trichloroethene	2800	14000	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Trichlorofluoromethane (CFC-11)	790000	3400000	6.0 U	-	750 UJ	-	-	-	240 U	-	4.3 U
Trifluorotrichloroethane (Freon 113)	43000000	180000000	6.0 U	-	750 U	-	-	-	240 U	-	4.3 U
Vinyl chloride	60	1700	54	-	750 U	-	-	-	240 U	-	4.3 U
Xylene (total)	630000	2700000	1.9 J	-	950 J	-	-	-	480 U	-	8.6 U
Semi-Volatiles											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	4600	22000	120 UJ	-	1100 U	-	-	-	-	-	1100 U
2,4,5-Trichlorophenol	6100000	62000000	180 UJ	-	1600 U	-	-	-	-	-	1700 U
2,4,6-Trichlorophenol	44000	160000	180 UJ	-	1600 U	-	-	-	-	-	1700 U
2,4-Dichlorophenol	180000	1800000	180 UJ	-	1600 U	-	-	-	-	-	1700 U
2,4-Dimethylphenol	1200000	12000000	180 UJ	-	1600 U	-	-	-	-	-	1700 U
2,4-Dinitrophenol	120000	1200000	400 UJ	-	3500 U	-	-	-	-	-	3700 U
[illegible]-Dinitrotoluene	1600	5500	240 UJ	-	2100 U	-	-	-	-	-	2200 U
[illegible]-Dinitrotoluene	61000	620000	240 UJ	-	2100 U	-	-	-	-	-	2200 U
[illegible]-Chloronaphthalene	6300000	82000000	60 UJ	-	530 U	-	-	-	-	-	550 U
2-Chlorophenol	390000	5100000	60 UJ	-	530 U	-	-	-	-	-	550 U

TABLE A4.1

CRA SOIL SAMPLING ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*BHB-09*	*Construction Debris area*	*MW-219*	*NEFormerAirCurtainDestructorFromAshPile*	*NW of MW101A; from ash pile*	*NW of MW101A; from ash pile*	*VAS-4*	*VAS-5*	*VAS-21B*
Sample ID:			*S-38443-062009-DR-002*	*S-038433-071108-GL-004*	*S-38443-120409-DR-001*	*S-034443-071108-GL-001*	*S-038433-071108-GL-002*	*S-038443-071108-GL-003*	*S-38443-110608-KMV-201*	*S-38443-121508-KMV-096*	*S-38443-062209-DR-001*
Sample Date:			*6/20/2009*	*7/11/2008*	*12/4/2009*	*7/11/2008*	*7/1/2008*	*7/1/2008*	*11/6/2008*	*12/15/2008*	*6/2/2009*
Sample Depth:			*3-5 ft BGS*	-	-	-	-	-	*24-25 ft BGS*	*7 ft BGS*	*3-5 ft BGS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*									
2-Methylnaphthalene	310000	4100000	38 J	-	660	-	-	-	-	-	74 U
2-Methylphenol	3100000	31000000	240 UJ	-	2100 U	-	-	-	-	-	2200 U
2-Nitroaniline	610000	6000000	240 UJ	-	2100 U	-	-	-	-	-	2200 U
2-Nitrophenol	-	-	60 UJ	-	530 U	-	-	-	-	-	550 U
3,3'-Dichlorobenzidine	1100	3800	120 UJ	-	1100 U	-	-	-	-	-	1100 U
3-Nitroaniline	-	-	240 UJ	-	2100 U	-	-	-	-	-	2200 U
4,6-Dinitro-2-methylphenol	6100	62000	180 UJ	-	1600 U	-	-	-	-	-	1700 U
4-Bromophenyl phenyl ether	-	-	60 UJ	-	530 U	-	-	-	-	-	550 U
4-Chloro-3-methylphenol	6100000	62000000	180 UJ	-	1600 U	-	-	-	-	-	1700 U
4-Chloroaniline	2400	8600	180 UJ	-	1600 U	-	-	-	-	-	1700 U
4-Chlorophenyl phenyl ether	-	-	60 UJ	-	530 U	-	-	-	-	-	550 U
4-Methylphenol	310000	3100000	240 UJ	-	2100 U	-	-	-	-	-	2200 U
Semi-Volatiles (continued)											
4-Nitroaniline	24000	86000	240 UJ	-	2100 U	-	-	-	-	-	2200 U
4-Nitrophenol	-	-	400 UJ	-	3500 U	-	-	-	-	-	3700 U
Acenaphthene	3400000	33000000	8.0 UJ	-	71 U	-	-	-	-	-	74 U
Acenaphthylene	-	-	8.0 UJ	-	71 U	-	-	-	-	-	74 U
Acetophenone	7800000	100000000	120 UJ	-	1100 U	-	-	-	-	-	1100 U
Anthracene	17000000	170000000	8.0 UJ	-	71 U	-	-	-	-	-	280
Atrazine	2100	7500	240 UJ	-	2100 U	-	-	-	-	-	2200 U
Benzaldehyde	7800000	100000000	120 UJ	-	1100 U	-	-	-	-	-	1100 U
Benzo(a)anthracene	150	2100	11 J	-	71 U	-	-	-	-	-	360*
Benzo(a)pyrene	15	210	8.0 UJ	-	71 U	-	-	-	-	-	410**
Benzo(b)fluoranthene	150	2100	9.0 J	-	71 U	-	-	-	-	-	480*
Benzo(g,h,i)perylene	-	-	8.0 UJ	-	71 U	-	-	-	-	-	320
Benzo(k)fluoranthene	1500	21000	8.0 UJ	-	71 U	-	-	-	-	-	310
Biphenyl (1,1-Biphenyl)	3900000	51000000	60 UJ	-	530 U	-	-	-	-	-	550 U
bis(2-Chloroethoxy)methane	180000	1800000	120 UJ	-	1100 U	-	-	-	-	-	1100 U
bis(2-Chloroethyl)ether	210	1000	120 UJ	-	1100 U	-	-	-	-	-	1100 U
bis(2-Ethylhexyl)phthalate (DEHP)	35000	120000	60 UJ	-	240 J	-	-	-	-	-	550 U
Butyl benzylphthalate (BBP)	260000	910000	60 UJ	-	530 U	-	-	-	-	-	550 U
Caprolactam	31000000	310000000	400 UJ	-	3500 U	-	-	-	-	-	3700 U
Carbazole	-	-	60 UJ	-	530 U	-	-	-	-	-	550 U
Chrysene	15000	210000	11 J	-	71 U	-	-	-	-	-	380
Dibenz(a,h)anthracene	15	210	8.0 UJ	-	71 U	-	-	-	-	-	74 U
Dibenzofuran	78000	1000000	60 UJ	-	530 U	-	-	-	-	-	550 U
Diethyl phthalate	49000000	490000000	60 UJ	-	530 U	-	-	-	-	-	550 U
Dimethyl phthalate	-	-	60 UJ	-	530 U	-	-	-	-	-	550 U
Di-n-butylphthalate (DBP)	6100000	62000000	60 UJ	-	530 U	-	-	-	-	-	550 U
Di-n-octyl phthalate (DnOP)	-	-	60 UJ	-	530 U	-	-	-	-	-	550 U
Fluoranthene	2300000	22000000	21 J	-	130	-	-	-	-	-	690
Fluorene	2300000	22000000	8.0 UJ	-	71 U	-	-	-	-	-	74 U
Hexachlorobenzene	300	1100	8.0 UJ	-	71 U	-	-	-	-	-	74 U
Hexachlorobutadiene	6200	22000	60 UJ	-	530 U	-	-	-	-	-	550 U
Hexachlorocyclopentadiene	370000	3700000	R	-	3500 U	-	-	-	-	-	3700 U
Hexachloroethane	35000	120000	60 UJ	-	530 U	-	-	-	-	-	550 U
Indeno(1,2,3-cd)pyrene	150	2100	8.0 UJ	-	71 U	-	-	-	-	-	300*
Isophorone	510000	1800000	60 UJ	-	530 U	-	-	-	-	-	550 U
Naphthalene	3600	18000	44 J	-	600	-	-	-	-	-	74 U
Nitrobenzene	4800	24000	120 UJ	-	1100 U	-	-	-	-	-	1100 U
N-Nitrosodi-n-propylamine	69	250	60 UJ	-	530 U	-	-	-	-	-	550 U
N-Nitrosodiphenylamine	99000	350000	60 UJ	-	530 U	-	-	-	-	-	550 U
Pentachlorophenol	3000	9000	180 UJ	-	1600 U	-	-	-	-	-	1700 U
Phenanthrene	-	-	42 J	-	210	-	-	-	-	-	360
Phenol	18000000	180000000	60 UJ	-	530 U	-	-	-	-	-	550 U
Pyrene	1700000	17000000	15 J	-	100	-	-	-	-	-	520

TABLE A4.1

CRA SOIL SAMPLING ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*BH8-09*	*Construction Debris area*	*MW-219*	*NEFormerAirCurtainDestructorFromAshPile*	*NW of MW101A; from ash pile*	*NW of MW101A; from ash pile*	*VAS-4*	*VAS-5*	*VAS-21B*
Sample ID:			*S-38443-062009-DR-002*	*S-038433-071108-GL-004*	*S-38443-120409-DR-001*	*S-034443-071108-GL-001*	*S-038433-071108-GL-002*	*S-038443-071108-GL-003*	*S-38443-110608-KMV-201*	*S-38443-121508-KMV-096*	*S-38443-060209-DR-001*
Sample Date:			*6/20/2009*	*7/11/2008*	*12/4/2009*	*7/11/2008*	*7/11/2008*	*7/11/2008*	*11/6/2008*	*12/15/2008*	*6/2/2009*
Sample Depth:			*3-5 ft BGS*	-	-	-	-	-	*24-25 ft BGS*	*7 ft BGS*	*3-5 ft BGS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*									
Metals (mg/kg)											
Aluminum	77000	990000	3650	-	-	-	-	-	-	-	5450
Antimony	31	410	0.67 J	-	-	-	-	-	-	-	0.68 J
Arsenic	0.39	1.6	6.6**	-	5.5 J**	-	-	-	-	-	7.6**
Barium	15000	190000	23.7 J	-	-	-	-	-	-	-	106 J
Beryllium	160	2000	0.25 J	-	-	-	-	-	-	-	0.54 J
Cadmium	70	800	0.60 U	-	-	-	-	-	-	-	0.91
Calcium	-	-	2650	-	-	-	-	-	-	-	108000
Chromium	-	-	105	-	-	-	-	-	-	-	12.7
Cobalt	23	300	5.5 J	-	-	-	-	-	-	-	4.7 J
Copper	3100	41000	70.6 J	-	-	-	-	-	-	-	66.7 J
Iron	55000	720000	69100*	-	-	-	-	-	-	-	11300
Lead	400	800	9.4 J	-	7.0 J	-	-	-	-	-	124 J
Magnesium	-	-	722	-	-	-	-	-	-	-	32800
Manganese	1800	23000	1140	-	-	-	-	-	-	-	362
Mercury	5.6	34	0.12 U	-	-	-	-	-	-	-	0.096 J
Nickel	1500	20000	42.6	-	-	-	-	-	-	-	12.8
Potassium	-	-	262 J	-	-	-	-	-	-	-	785
Selenium	390	5100	1.1 J	-	-	-	-	-	-	-	27.7 U
Silver	390	5100	1.2 U	-	-	-	-	-	-	-	1.1 U
Sodium	-	-	599 U	-	-	-	-	-	-	-	554 U
Thallium	-	-	0.12 U	-	-	-	-	-	-	-	0.19
Vanadium	390	5200	11.0	-	-	-	-	-	-	-	17.1
[illegible]	23000	310000	26.9	-	-	-	-	-	-	-	291
PCBs											
Aroclor-1016 (PCB-1016)	3900	21000	40 U	-	35 U	-	-	-	-	-	37 U
Aroclor-1221 (PCB-1221)	140	540	40 U	-	35 U	-	-	-	-	-	37 U
Aroclor-1232 (PCB-1232)	140	540	40 U	-	35 U	-	-	-	-	-	37 U
Aroclor-1242 (PCB-1242)	220	740	40 U	-	35 U	-	-	-	-	-	37 U
Aroclor-1248 (PCB-1248)	220	740	40 U	-	35 U	-	-	-	-	-	37 U
Aroclor-1254 (PCB-1254)	220	740	40 U	-	40	-	-	-	-	-	37 U
Aroclor-1260 (PCB-1260)	220	740	40 U	-	35 U	-	-	-	-	-	37 U
Pesticides											
4,4'-DDD	2000	7200	-	-	1.8 U	-	-	-	-	-	-
4,4'-DDE	1400	5100	-	-	1.6 J	-	-	-	-	-	-
4,4'-DDT	1700	7000	-	-	1.8 U	-	-	-	-	-	-
Aldrin	29	100	-	-	1.8 U	-	-	-	-	-	-
alpha-BHC	77	270	-	-	1.8 U	-	-	-	-	-	-
alpha-Chlordane	-	-	-	-	1.8 U	-	-	-	-	-	-
beta-BHC	270	960	-	-	1.8 U	-	-	-	-	-	-
delta-BHC	-	-	-	-	1.8 U	-	-	-	-	-	-
Dieldrin	30	110	-	-	1.8 U	-	-	-	-	-	-
Endosulfan I	-	-	-	-	1.8 U	-	-	-	-	-	-
Endosulfan II	-	-	-	-	1.8 U	-	-	-	-	-	-
Endosulfan sulfate	-	-	-	-	1.8 U	-	-	-	-	-	-
Endrin	18000	180000	-	-	1.8 U	-	-	-	-	-	-
Endrin aldehyde	-	-	-	-	1.8 U	-	-	-	-	-	-
Endrin ketone	-	-	-	-	1.8 U	-	-	-	-	-	-
gamma-BHC (lindane)	520	2100	-	-	1.8 U	-	-	-	-	-	-
gamma-Chlordane	-	-	-	-	1.8 U	-	-	-	-	-	-
Heptachlor	110	380	-	-	1.8 U	-	-	-	-	-	-
Heptachlor epoxide	53	190	-	-	1.8 U	-	-	-	-	-	-
Methoxychlor	310000	3100000	-	-	3.5 U	-	-	-	-	-	-
Toxaphene	440	1600	-	-	71 U	-	-	-	-	-	-

TABLE A4.1

CRA SOIL SAMPLING ANALYTICAL RESULTS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				*Construction Debris area*	*MW-219*	*NEFormerAirCurtainDestructorFromAshPile*	*NW of MW101A; from ash pile*	*NW of MW101A; from ash pile*	*VAS-4*	*VAS-5*	*VAS-21B*
Sample ID:			*BH8-09*								
			S-38443-062009-DR-002	*S-038433-071108-GL-004*	*S-38443-120409-DR-001*	*S-034443-071108-GL-001*	*S-038433-071108-GL-002*	*S-038443-071108-GL-003*	*S-38443-110608-KMV-201*	*S-38443-121508-KMV-096*	*S-38443-060209-DR-001*
Sample Date:			*6/20/2009*	*7/11/2008*	*12/4/2009*	*7/11/2008*	*7/11/2008*	*7/11/2008*	*11/6/2008*	*12/15/2008*	*6/2/2009*
Sample Depth:			*3-5 ft BGS*	-	-	-	-	-	*24-25 ft BGS*	*7 ft BGS*	*3-5 ft BGS*
Parameter	*Residential Soil Criteria a*	*Industrial Soil Criteria b*									
Herbicides											
2,4,5-TP (Silvex)	490000	4900000	-	-	21 U	-	-	-	-	-	-
2,4-Dichlorophenoxyacetic acid (2,4-D)	690000	7700000	-	-	85 U	-	-	-	-	-	-
Dioxins/Furans (pg/g)											
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	-	-	-	-	-	22	-	19	-	-	-
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	-	-	-	-	-	460	-	16	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	-	-	-	-	-	21	-	16	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	-	-	-	-	-	86	-	7.7	-	-	-
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	-	-	-	-	-	1.4 U	-	0.59 U	-	-	-
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	-	-	-	-	-	8.3	-	4.8 J	-	-	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	-	-	-	-	-	9.8	-	1.3 U	-	-	-
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	-	-	-	-	-	3.6 J	-	1.0 U	-	-	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	-	-	-	-	-	9.4	-	1.2 U	-	-	-
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	-	-	-	-	-	0.22 U	-	0.17 U	-	-	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	-	-	-	-	-	13	-	2.3 U	-	-	-
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	-	-	-	-	-	2.2 U	-	0.30 U	-	-	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	-	-	-	-	-	5.5 J	-	1.0 U	-	-	-
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	-	-	-	-	-	3.0 U	-	0.81 U	-	-	-
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	-	-	-	-	-	3.6 J	-	0.62 U	-	-	-
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	-	-	-	-	-	3.9 CON	-	0.31 U CON	-	-	-
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	-	-	-	-	-	0.97 J	-	0.19 U	-	-	-
Total heptachlorodibenzofuran (HpCDF)	-	-	-	-	-	36	-	16	-	-	-
Total heptachlorodibenzo-p-dioxin (HpCDD)	-	-	-	-	-	160	-	12	-	-	-
Total hexachlorodibenzofuran (HxCDF)	-	-	-	-	-	22	-	4.8	-	-	-
Total hexachlorodibenzo-p-dioxin (HxCDD)	-	-	-	-	-	120	-	3.7	-	-	-
Total pentachlorodibenzofuran (PeCDF)	-	-	-	-	-	14	-	1.3	-	-	-
Total pentachlorodibenzo-p-dioxin (PeCDD)	-	-	-	-	-	23	-	1.2 U	-	-	-
Total TEQ (ND=0.5)	-	-	-	-	-	12	-	0.8	-	-	-
Total tetrachlorodibenzofuran (TCDF)	-	-	-	-	-	36	-	1.2 U	-	-	-
Total tetrachlorodibenzo-p-dioxin (TCDD)	-	-	-	-	-	17	-	1.5	-	-	-
Petroleum Products											
Total Petroleum Hydrocarbons - Extractable (DRO) (mg/kg)	-	-	-	-	1400	-	-	-	-	-	-
Total Petroleum Hydrocarbons - Purgeable (GRO)	-	-	-	-	410000 J	-	-	-	-	-	-
General Chemistry											
Asbestos (%)	-	-	-	ND	-	-	ND	-	-	-	-
Cellulose (%)	-	-	-	-	-	-	-	-	-	20	-
Chrysotile asbestos (%)	-	-	-	-	-	-	-	-	-	60	-
Total solids (%)	-	-	83.5	-	94.0	80.8	-	80.0	94.9	-	90.3

Notes:

All concentrations are expressed in units of micrograms per kilogram (µg/kg) unless otherwise noted.

CON - Confirmation analysis.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

ND - Not detected.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

TABLE A4.2

SUMMARY OF MAXIMUM RADIATION READINGS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Date	*Location*	*Maximum Radiation Reading (μR/h)*
11/07/2008	Outside entrance gate to 2139 Dryden Road (Background)	41
11/07/2008	Busy Bee Property	240
11/07/2008	Air Curtain Destructor	181
11/07/2008	Remaining Site	50 - 93
06/08/2008	Site Walk with USEPA Site personnel (CH2M Hill)	0.4
06/11/2008	VAS 4 background reading	61
07/11/2008	VAS 12 background reading	37
28/10/2008	VAS 21	49
01/10/2008	TT-18 (used dust control during excavation to reduce dust emissions from site)	22
01/10/2008	Stockpile	19
02/10/2008	TT-12	22
03/10/2008	TT-10	42
03/10/2008	Stockpile (foundry-type sand)	68
06/10/2008	TT-18 (used dust control during excavation to reduce dust emissions from site)	27
06/10/2008	TP-5	42
06/10/2008	TP-6	12
07/10/2008	TT-19 Hillside	43
07/10/2008	TT-20	11
07/10/2008	TT-7	10
07/10/2008	TT-6	10
08/10/2008	TT-22	42

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TP-1	TP-1	TP-1	TP-1	TP-2	TP-2	TP-3	TP-3	TP-3	TP-3	TP-4	TP-4	TP-4	TP-5	TP-5
Sample ID:				S-38443-082308-KMV-004	S-38443-082308-KMV-003	S-38443-082308-KMV-002	S-38443-082308-KMV-001	S-38443-082408-KMV-005	S-38443-082408-KMV-006	S-38443-082408-KMV-007	S-38443-082408-KMV-008	S-38443-082408-KMV-009	S-38443-082408-KMV-011	S-38443-082408-KMV-012	S-38443-082408-KMV-013	S-38443-082408-KMV-014	S-38443-100608-KMV-055	S-38443-100608-KMV-056
Sample Date:				9/23/2008	9/23/2008	9/23/2008	9/23/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	10/6/2008	10/6/2008
Sample Depth:				4 ft BGS	6 ft BGS	8 ft BGS	13 ft BGS	1 ft BGS	5 ft BGS	4 ft BGS	8.7 ft BGS	10.4 ft BGS	16 ft BGS	5 ft BGS	10 ft BGS	18.6 ft BGS	12 ft BGS	17 ft BGS
Parameter	Units	Residential Soil Criteria a	Industrial Soil Criteria b															
Volatiles																		
1,1,1-Trichloroethane	µg/kg	8700000	38000000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	2.1 J	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
1,1,2,2-Tetrachloroethane	µg/kg	560	2800	5.2 U	6.2 U	7.0 U	6.0 UJ	4.8 U	R	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
1,1,2-Trichloroethane	µg/kg	1100	5300	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
1,1-Dichloroethane	µg/kg	3300	17000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	220 J	18000 U	11 U	11 U	1.0 J	300 U	4.5 U
1,1-Dichloroethene	µg/kg	240000	1100000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
1,2,4-Trichlorobenzene	µg/kg	22000	99000	5.2 U	6.2 U	7.0 U	6.0 UJ	4.8 U	R	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	24 J	4.5 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	5.4	69	10 U	12 U	14 U	12 UJ	9.6 U	R	9.9 U	640 U	770 UJ	36000 U	23 U	21 U	14 U	600 U	8.9 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	34	170	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
1,2-Dichlorobenzene	µg/kg	1900000	9800000	5.2 U	6.2 U	7.0 U	6.0 UJ	4.8 U	R	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	42 J	4.5 U
1,2-Dichloroethane	µg/kg	430	2200	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
1,2-Dichloropropane	µg/kg	890	4500	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
1,3-Dichlorobenzene	µg/kg	-	-	5.2 U	6.2 U	7.0 U	6.0 UJ	4.8 U	R	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	44 J	4.5 U
1,4-Dichlorobenzene	µg/kg	2400	12000	5.2 U	6.2 U	7.0 U	0.87 J	4.8 U	2.0 J	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	24 J	4.5 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	28000000	200000000	21 U	3.4 J	4.4 J	24 U	19 U	34 UJ	20 U	1900	250 J	72000 U	46 U	43 U	27 U	1200 U	2.2 J
2-Hexanone	µg/kg	210000	1400000	21 U	25 U	28 U	24 U	19 U	34 UJ	20 U	1300 U	1500 UJ	72000 U	46 U	43 U	27 U	1200 U	18 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (I	µg/kg	5300000	53000000	21 U	25 U	28 U	24 U	19 U	34 UJ	20 U	1300 U	1500 UJ	72000 U	46 U	43 U	27 U	1200 U	18 U
Acetone	µg/kg	61000000	630000000	21 U	9.3 J	13 J	24 U	19 U	34 UJ	20 U	1300 U	1500 UJ	72000 U	46 U	43 U	19 J	1200 U	6.4 J
Benzene	µg/kg	1100	5400	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	23 J	21 J	18000 U	11 U	11 U	6.9 U	260 J	0.67 J
Bromodichloromethane	µg/kg	270	1400	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Bromoform	µg/kg	61000	220000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Bromomethane (Methyl bromide)	µg/kg	7300	32000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Carbon disulfide	µg/kg	820000	3700000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Carbon tetrachloride	µg/kg	250	1200	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Chlorobenzene	µg/kg	290000	1400000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	3.3 J	930	8500 J	540000	11 U	11 U	6.9 U	9800	26
Chloroethane	µg/kg	15000000	61000000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Chloroform (Trichloromethane)	µg/kg	290	1500	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Chloromethane (Methyl chloride)	µg/kg	120000	500000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
cis-1,2-Dichloroethene	µg/kg	780000	10000000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
cis-1,3-Dichloropropene	µg/kg	-	-	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Cyclohexane	µg/kg	7000000	29000000	10 U	12 U	14 U	12 U	9.6 U	17 UJ	9.9 U	78 J	71 J	36000 U	23 U	21 U	14 U	230 J	1.7 J
Dibromochloromethane	µg/kg	680	3300	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Dichlorodifluoromethane (CFC-12)	µg/kg	180000	780000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Ethylbenzene	µg/kg	5400	27000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	25 J	31 J	18000 U	11 U	11 U	6.9 U	2400	22
Isopropyl benzene	µg/kg	2100000	11000000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	75 J	390 UJ	18000 U	11 U	11 U	6.9 U	680	3.9 J
Methyl acetate	µg/kg	78000000	1000000000	10 U	12 U	14 U	12 U	9.6 U	17 UJ	9.9 U	220 J	170 J	36000 U	23 U	21 U	14 U	290 J	8.9 U
Methyl cyclohexane	µg/kg	-	-	10 U	12 U	14 U	12 U	9.6 U	17 UJ	9.9 U	130 J	110 J	36000 U	23 U	21 U	1.1 J	2400	14
Methyl tert butyl ether (MTBE)	µg/kg	43000	220000	21 U	25 U	28 U	24 U	19 U	34 UJ	20 U	1300 U	1500 UJ	72000 U	46 U	43 U	27 U	1200 U	18 U
Methylene chloride	µg/kg	11000	53000	5.2 U	6.2 U	2.6 J	6.0 U	4.8 U	7.7 J	4.9 U	320 U	390 UJ	18000 U	11 U	3.6 J	1.5 J	300 U	4.5 U
Styrene	µg/kg	6300000	36000000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 UJ	390 UJ	18000 UJ	11 U	11 U	6.9 U	300 U	4.5 U
Tetrachloroethene	µg/kg	550	2600	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	25 J	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Toluene	µg/kg	5000000	45000000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	69 J	54 J	18000 U	11 U	1.2 J	6.9 U	1100	8.2
trans-1,2-Dichloroethene	µg/kg	150000	690000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
trans-1,3-Dichloropropene	µg/kg	-	-	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Trichloroethene	µg/kg	2800	14000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	16 J	4.5 U
Trichlorofluoromethane (CFC-11)	µg/kg	790000	3400000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Trifluorotrichloroethane (Freon 113)	µg/kg	43000000	180000000	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	21 J	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Vinyl chloride	µg/kg	60	1700	5.2 U	6.2 U	7.0 U	6.0 U	4.8 U	8.5 UJ	4.9 U	320 U	390 UJ	18000 U	11 U	11 U	6.9 U	300 U	4.5 U
Xylene (total)	µg/kg	630000	2700000	10 U	12 U	14 U	12 U	9.6 U	17 UJ	9.9 U	290 J	260 J	36000 U	23 U	2.6 J	14 U	12000	130

TABLE A4.3

TEST FIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TP-1	TP-1	TP-1	TP-1	TP-2	TP-2	TP-3	TP-3	TP-3	TP-3	TP-4	TP-4	TP-4	TP-5	TP-5
Sample ID:				S-38443-092308-KMV-004	S-38443-092308-KMV-005	S-38443-092308-KMV-002	S-38443-092308-KMV-001	S-38443-092408-KMV-005	S-38443-092408-KMV-006	S-38443-092408-KMV-007	S-38443-092408-KMV-008	S-38443-092408-KMV-009	S-38443-092408-KMV-011	S-38443-092408-KMV-012	S-38443-092408-KMV-013	S-38443-092408-KMV-014	S-38443-100608-KMV-055	S-38443-100608-KMV-056
Sample Date:				9/23/2008	9/23/2008	9/23/2008	9/23/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	10/6/2008	10/6/2008
Sample Depth:				4 ft BGS	6 ft BGS	8 ft BGS	13 ft BGS	1 ft BGS	5 ft BGS	6 ft BGS	8.7 ft BGS	10.4 ft BGS	16 ft BGS	5 ft BGS	10 ft BGS	18.5 ft BGS	12 ft BGS	17 ft BGS
Parameter	*Units*	*Residential Soil Criteria a*	*Industrial Soil Criteria b*															
Semi-Volatiles																		
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopro	µg/kg	4600	23000	110 U	110 U	130 U	120 U	110 U	160 U	110 U	2800 U	2800 U	170 U	110 U	110 U	600 U	2600 U	100 U
2,4,5-Trichlorophenol	µg/kg	6100000	62000000	160 U	170 U	190 U	180 U	160 U	240 U	170 U	4200 U	4200 U	250 U	160 U	170 U	900 U	3800 U	160 U
2,4,6-Trichlorophenol	µg/kg	44000	160000	160 U	170 U	190 U	180 U	160 U	240 U	170 U	4200 U	4200 U	250 U	160 U	170 U	900 U	3800 U	160 U
2,4-Dichlorophenol	µg/kg	180000	1800000	160 U	170 U	190 U	180 U	160 U	240 U	170 U	4200 U	4200 U	250 U	160 U	170 U	900 U	3800 U	160 U
2,4-Dimethylphenol	µg/kg	1200000	12000000	160 U	170 U	190 U	180 U	160 U	240 U	170 U	4200 U	4200 U	250 U	160 U	170 U	900 U	3800 U	160 U
2,4-Dinitrophenol	µg/kg	120000	1200000	360 U	370 U	430 U	R	360 U	520 U	370 U	9200 U	9200 U	550 U	360 U	370 U	2000 U	8400 U	340 U
2,4-Dinitrotoluene	µg/kg	1600	5900	220 U	230 U	260 U	240 U	220 U	320 U	220 U	5600 U	5600 U	330 U	220 U	230 U	1200 U	5100 U	210 U
2,6-Dinitrotoluene	µg/kg	61000	620000	220 U	230 U	260 U	240 U	220 U	320 U	220 U	5600 U	5600 U	330 U	220 U	230 U	1200 U	5100 U	210 U
2-Chloronaphthalene	µg/kg	6300000	62000000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
2-Chlorophenol	µg/kg	390000	5100000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	50 J	55 U	56 U	300 U	1300 U	52 U
2-Methylnaphthalene	µg/kg	310000	4100000	13	12	16	28	7.3 U	11 U	13	190 U	190 U	31	36	1100	120	1700	27
2-Methylphenol	µg/kg	3100000	31000000	220 U	230 U	260 U	240 U	220 U	320 U	220 U	5600 U	5600 U	330 U	220 U	230 U	1200 U	5100 UJ	210 UJ
2-Nitroaniline	µg/kg	610000	6000000	220 U	230 U	260 U	240 U	220 U	320 U	220 U	5600 U	5600 U	330 U	220 U	230 U	1200 U	5100 U	210 U
2-Nitrophenol	µg/kg	-	-	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
3,3'-Dichlorobenzidine	µg/kg	1100	3800	110 U	110 U	130 U	120 U	110 U	160 U	110 U	2800 U	2800 U	170 U	110 U	110 U	600 U	2600 U	100 U
3-Nitroaniline	µg/kg	-	-	220 U	230 U	260 U	240 U	220 U	320 U	220 U	5600 U	5600 U	330 U	220 U	230 U	1200 U	5100 U	210 U
4,6-Dinitro-2-methylphenol	µg/kg	6100	62000	160 U	170 U	190 U	R	160 U	240 U	170 U	4200 U	4200 U	250 U	160 U	170 U	900 U	3800 U	160 U
4-Bromophenyl phenyl ether	µg/kg	-	-	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
4-Chloro-3-methylphenol	µg/kg	6100000	62000000	160 U	170 U	190 U	180 U	160 U	240 U	170 U	4200 U	4200 U	250 U	160 U	170 U	900 U	3800 U	160 U
4-Chloroaniline	µg/kg	2600	8600	160 U	170 U	190 U	180 U	160 U	240 U	170 U	4200 U	4200 U	250 U	160 U	170 U	900 U	3800 U	160 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
4-Methylphenol	µg/kg	310000	3100000	220 U	230 U	260 U	240 U	220 U	320 U	220 U	5600 U	5600 U	330 U	220 U	230 U	1200 U	5100 U	210 U
4-Nitroaniline	µg/kg	24000	86000	220 U	230 U	260 U	240 U	220 U	320 U	220 U	5600 U	5600 U	330 U	220 U	230 U	1200 U	5100 U	210 U
4-Nitrophenol	µg/kg	-	-	360 U	370 U	430 U	400 U	360 U	520 U	370 U	9200 U	9200 U	550 U	360 U	370 U	2000 U	8400 U	340 U
Acenaphthene	µg/kg	3400000	33000000	9.7	7.5 U	8.6 U	14	7.3 U	11 U	18	190 U	190 U	11 U	7.3 U	7.5 U	40 U	170 U	6.9 U
Acenaphthylene	µg/kg	-	-	22	7.5 U	8.6 U	37	7.3 U	11 U	7.4 U	190 U	190 U	11 U	7.3 U	7.5 U	40 U	170 U	6.9 U
Acetophenone	µg/kg	7800000	100000000	110 U	110 U	130 U	120 U	110 U	160 U	110 U	2800 U	2800 U	170 U	110 U	110 U	600 U	2600 U	100 U
Anthracene	µg/kg	17000000	170000000	83	8.6	8.6 U	39	7.3 U	11 U	45	430	500	57	7.3 U	7.5 U	40 U	170 U	6.9 U
Atrazine	µg/kg	2100	7500	220 U	230 U	260 U	240 U	220 U	320 U	220 U	5600 U	5600 U	330 U	220 U	230 U	1200 U	5100 U	210 U
Benzaldehyde	µg/kg	7800000	100000000	110 U	110 U	130 U	120 U	110 U	160 U	110 U	2800 U	2800 U	170 U	110 U	110 U	600 U	2600 U	100 U
Benzo(a)anthracene	µg/kg	150	2100	1100*	7.5 U	8.6 U	140	33	11 U	140*	490*	190 U	120	16	100	40 U	170 U	22
Benzo(a)pyrene	µg/kg	15	210	980*	7.5 U	8.6 U	140*	35*	11 U	150*	350*	190 U	88*	13	44*	40 U	170 U	14
Benzo(b)fluoranthene	µg/kg	150	2100	1800*	7.5 U	8.6 U	180 J*	46	11 U	180*	530*	190 U	120	21	110	68	170 U	23
Benzo(g,h,i)perylene	µg/kg	-	-	920	7.5 U	8.6 U	120 J	22	11 U	97	200	190 U	55	11	47	40 U	170 U	8.7
Benzo(k)fluoranthene	µg/kg	1500	21000	710	7.5 U	8.6 U	52	21	11 U	85	200	190 U	41	7.3 U	7.5 U	40 U	170 U	10
Biphenyl (1,1-Biphenyl)	µg/kg	3900000	51000000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
bis(2-Chloroethoxy)methane	µg/kg	180000	1800000	110 U	110 U	130 U	120 U	110 U	160 U	110 U	2800 U	2800 U	170 U	110 U	110 U	600 U	2600 U	100 U
bis(2-Chloroethyl)ether	µg/kg	210	1000	110 U	110 U	130 U	120 U	110 U	160 U	110 U	2800 U	2800 U	170 U	110 U	110 U	600 U	2600 U	100 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/kg	35000	120000	55 U	57 U	46 J	110	55 U	79 U	32 J	3800	6200	82 J	55 U	56 U	160 J	4100 U	84 U
Butyl benzylphthalate (BBP)	µg/kg	260000	910000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
Caprolactam	µg/kg	31000000	310000000	360 U	370 U	430 U	400 U	360 U	520 U	370 U	9200 U	9200 U	550 U	360 U	370 U	2000 U	8400 U	340 U
Carbazole	µg/kg	-	-	22 J	57 U	65 U	60 U	55 U	79 U	31 J	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
Chrysene	µg/kg	15000	210000	1300	7.5 U	11	150	41	11 U	140	620	360	110	18	120	40 U	530	22
Dibenz(a,h)anthracene	µg/kg	15	210	270*	7.5 U	8.6 U	22*	7.3 U	11 U	25*	190 U	190 U	12	7.3 U	7.5 U	40 U	170 U	6.9 U
Dibenzofuran	µg/kg	78000	1000000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	310	300 U	1300 U	52 U
Diethyl phthalate	µg/kg	490000000	490000000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	53 U	56 U	300 U	1300 U	52 U
Dimethyl phthalate	µg/kg	-	-	55 U	57 U	65 U	60 U	55 U	79 U	56 U	2000	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
Di-n-butylphthalate (DBP)	µg/kg	6100000	62000000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	910 J	52 U
Di-n-octyl phthalate (DnOP)	µg/kg	-	-	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
Fluoranthene	µg/kg	2300000	23000000	1400	18	15	230 J	73	11 U	360	1600	720	270	30	120	110	970	31
Fluorene	µg/kg	2300000	23000000	8.2	9.3	8.6 U	23	7.3 U	11 U	16	1700	3900	11 U	7.3 U	7.5 U	40 U	400	6.9 U
Hexachlorobenzene	µg/kg	300	1100	7.3 U	7.5 U	8.6 U	8.0 U	7.3 U	11 U	7.4 U	190 U	190 U	11 U	7.3 U	7.5 U	40 U	170 U	6.9 U
Hexachlorobutadiene	µg/kg	6200	22000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
Hexachlorocyclopentadiene	µg/kg	370000	3700000	360 U	370 U	430 U	R	360 U	520 U	370 U	9200 U	9200 U	550 U	360 U	370 U	2000 U	8400 U	340 U
Hexachloroethane	µg/kg	35000	120000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
Indeno(1,2,3-cd)pyrene	µg/kg	150	2100	850*	7.5 U	8.6 U	73 J	26	11 U	78	190 U	190 U	41	8.1	19	40 U	170 U	7.3
Isophorone	µg/kg	510000	1800000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
Naphthalene	µg/kg	3600	18000	13	7.5 U	8.7	21	7.3 U	11 U	10	190 U	190 U	22	27	620	64	3500*	38
Nitrobenzene	µg/kg	4800	24000	110 U	110 U	130 U	120 U	110 U	160 U	110 U	2800 U	2800 U	170 U	110 U	110 U	600 U	2600 U	100 U
N-Nitrosodi-n-propylamine	µg/kg	69	250	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
N-Nitrosodiphenylamine	µg/kg	99000	360000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
Pentachlorophenol	µg/kg	3000	9000	160 U	170 U	190 U	180 U	160 U	240 U	170 U	4200 U	4200 U	250 U	160 U	170 U	900 U	3800 U	160 U
Phenanthrene	µg/kg	-	-	370	25	14	140	26	11 U	210	2100	2700	180	32	610	110	1100	25
Phenol	µg/kg	18000000	180000000	55 U	57 U	65 U	60 U	55 U	79 U	56 U	1400 U	1400 U	84 U	55 U	56 U	300 U	1300 U	52 U
Pyrene	µg/kg	1700000	17000000	1100	15	16	250	61	11 U	270	1000	630	210	24	120	110	680	34

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TP-1	TP-1	TP-1	TP-1	TP-2	TP-2	TP-3	TP-3	TP-3	TP-3	TP-4	TP-4	TP-4	TP-5	TP-5
Sample ID:				S-38443-092308-KMV-004	S-38443-092308-KMV-003	S-38443-092308-KMV-002	S-38443-092308-KMV-001	S-38443-092408-KMV-005	S-38443-092408-KMV-006	S-38443-092408-KMV-007	S-38443-092408-KMV-008	S-38443-092408-KMV-009	S-38443-092408-KMV-011	S-38443-092408-KMV-012	S-38443-092408-KMV-013	S-38443-092408-KMV-014	S-38443-100608-KMV-055	S-38443-100608-KMV-056
Sample Date:				9/23/2008	9/23/2008	9/23/2008	9/23/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	9/24/2008	10/6/2008	10/6/2008
Sample Depth				4 ft BGS	6 ft BGS	8 ft BGS	12 ft BGS	1 ft BGS	5 ft BGS	4 ft BGS	8.7 ft BGS	10.4 ft BGS	16 ft BGS	5 ft BGS	10 ft BGS	18.5 ft BGS	12 ft BGS	17 ft BGS
Parameter	*Units*	*Residential Soil Criteria a*	*Industrial Soil Criteria b*															
Metals																		
Aluminum	mg/kg	77000	990000	4380	7780	7800	5540	6250	5620	4610	4500	3740	3640	1050	2210	5440	10700	2260
Antimony	mg/kg	31	410	0.44 J	0.78 J	4.2 J	1.1 J	6.6 U	9.5 U	6.7 U	6.7 U	16.1	10.0 U	6.6 U	6.8 U	56.8*	12.2 J	6.2 UJ
Arsenic	mg/kg	0.39	1.6	5.2 J**	35.4 J**	43.2 J**	14.9 J**	8.3**	22.6**	8.9**	9.1**	8.6**	10**	2.4**	5.5**	14.3**	14.2**	2.9**
Barium	mg/kg	15000	190000	49.1	172	215	98.8	56.7	173	54.7	180	279	215	59.4	189	1180	7810	50.8
Beryllium	mg/kg	160	2000	0.27 J	1.8 J	2.1 J	1.1 J	0.32 J	2.7 J	0.18 J	0.38 J	0.73 J	1.5 J	0.18 J	0.46 J	0.57 J	0.62 J	0.52 U
Cadmium	mg/kg	70	800	0.28 J	0.35 J	0.39 J	0.42 J	0.29 J	0.20 J	0.89	6.2	4.7	0.22 J	0.069 J	0.096 J	11.4	7.8 J	0.28 J
Calcium	mg/kg	-	-	47600	16800	12500	57500	38700	1360	55100	55700	36500	2350	6700	1980	47100	42900	117000
Chromium	mg/kg	-	-	8.7 J	20.0 J	21.8 J	15.0 J	9.9	14.9	73.2	59.6	28.5	4.3	2.5	6.2	65.8	185 J	8.4 J
Cobalt	mg/kg	23	300	2.9 J	6.6 J	6.4 J	4.8 J	5.1 J	8.1	7.4	6.7	7.1	4.2 J	2.4 J	5.6	14.2	9.3	3.5 J
Copper	mg/kg	3100	41000	22.8	28.0	34.5	25.8	15.8	34.4	147	446	4050*	31.7	7.9	20.8	626	2590 J	15.2 J
Iron	mg/kg	55800	720000	8520	13400	16000	12500	13500	4960	49400	36700	33800	11200	2190	1860	38900	63600*	8000
Lead	mg/kg	400	800	32.2	15.5	23.1	17.7	17.3	14.3 J	47.0	316	1360**	7.8 J	3.7 J	7.6 J	549*	5020**	59.1
Magnesium	mg/kg	-	-	15800	6050	4540	33400	18600	480 J	19300	31900	11500	587 J	2770	419 J	9910	37100	42100
Manganese	mg/kg	1800	23000	321	66.4	79.3	136	445	64.0	542	386	222	22.2	36.8	6.9	364	561 J	226 J
Mercury	mg/kg	5.6	34	0.048 J	0.072 J	0.054 J	0.068 J	0.079 J	0.16	0.084 J	0.068 J	0.089 J	0.17 U	0.11 U	0.058 J	0.17	0.24	0.10 U
Nickel	mg/kg	1500	20000	9.1	14.6	16.3	11.9	11.8	16.6	46.7	52.1	58.5	14.3	4.5	11.3	95.8	241 J	10.1 J
Potassium	mg/kg	-	-	533 J	1290	1220	908	735	1250	788	747	624 J	781 J	160 J	980	683	1200	378 J
Selenium	mg/kg	390	5100	27.3 U	6.6 J	8.9 J	7.2 J	27.5 U	7.9 J	27.8 U	27.9 U	34.9 U	41.9 U	27.5 U	1.1 J	0.64 J	31.9 U	26.0 U
Silver	mg/kg	390	5100	1.1 U	1.1 U	1.3 U	1.2 U	1.1 U	1.6 U	0.15 J	0.20 J	0.78 J	1.7 U	0.11 J	1.1 U	1.9	1.2 J	1.0 U
Sodium	mg/kg	-	-	547 U	566 U	646 U	602 U	550 U	791 U	103 J	131 J	185 J	175 J	580 U	92.4 J	527 J	1510	256 J
Thallium	mg/kg	-	-	0.15	1.8	2.0	1.2	0.17	0.61	0.15	0.17	0.70 U	0.19	0.11 U	0.27	0.16	0.64 U	0.10 U
Vanadium	mg/kg	390	5200	10.9	39.7	41.9	30.2	17.1	48.6	16.0	19.4	22.5	15.6	6.4	16.6	19.0	34.0	11.9
Zinc	mg/kg	23000	310000	60.0 J	30.8 J	37.6 J	40.1 J	53.7 J	20.7 J	97.6 J	189 J	259 J	18.4 J	7.7 J	12.7 J	1030 J	2990	32.9
PCBs																		
Aroclor-1016 (PCB-1016)	µg/kg	3900	21000	36 U	190 U	210 U	200 U	36 U	52 U	37 U	37 U	46 U	55 U	36 U	37 U	40 U	2100 U	34 U
Aroclor-1221 (PCB-1221)	µg/kg	140	540	36 U	190 U	210 U	200 U	36 U	52 U	37 U	37 U	46 U	55 U	36 U	37 U	40 U	2100 U	34 U
Aroclor-1232 (PCB-1232)	µg/kg	140	540	36 U	190 U	210 U	200 U	36 U	52 U	37 U	37 U	46 U	55 U	36 U	37 U	40 U	2100 U	34 U
Aroclor-1242 (PCB-1242)	µg/kg	220	740	36 U	190 U	210 U	200 U	36 U	52 U	37 U	37 U	46 U	55 U	36 U	37 U	40 U	10000*	35
Aroclor-1248 (PCB-1248)	µg/kg	220	740	36 U	1000**	990**	2200**	36 U	52 U	37 U	37 U	46 U	55 U	36 U	37 U	40 U	2100 U	34 U
Aroclor-1254 (PCB-1254)	µg/kg	220	740	36 U	190 U	210 U	200 U	36 U	52 U	37 U	37 U	80	55 U	36 U	37 U	140	2800**	23 J
Aroclor-1260 (PCB-1260)	µg/kg	220	740	36 U	160 J	180 J	270*	23 J	47 J	86	110 J	46 U	55 U	36 U	37 U	40 U	2100 U	34 U
Pesticides																		
4,4'-DDD	µg/kg	2000	7200	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
4,4'-DDE	µg/kg	1400	5100	93 U	46 J	27 J	69 J	9.3 U	2.7 U	8.4 J	95 U	12 J	16 J	12 J	17 J	17 J	220 U	18 U
4,4'-DDT	µg/kg	1700	7000	93 UJ	96 UJ	110 UJ	100 UJ	9.3 UJ	2.7 UJ	19 UJ	95 U	24 UJ	28 UJ	37 UJ	38 U	41 UJ	110 J	18 UJ
Aldrin	µg/kg	29	100	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
alpha-BHC	µg/kg	77	270	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
alpha-Chlordane	µg/kg	-	-	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
beta-BHC	µg/kg	270	960	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
delta-BHC	µg/kg	-	-	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
Dieldrin	µg/kg	30	110	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	24 J	41 U	68 J*	18 U
Endosulfan I	µg/kg	-	-	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
Endosulfan II	µg/kg	-	-	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	22 J	41 U	220 U	18 U
Endosulfan sulfate	µg/kg	-	-	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
Endrin	µg/kg	18000	180000	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
Endrin aldehyde	µg/kg	-	-	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
Endrin ketone	µg/kg	-	-	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
gamma-BHC (lindane)	µg/kg	520	2100	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
gamma-Chlordane	µg/kg	-	-	93 U	43 J	36 J	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
Heptachlor	µg/kg	110	380	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
Heptachlor epoxide	µg/kg	53	190	93 U	96 U	110 U	100 U	9.3 U	2.7 U	19 U	95 U	24 U	28 U	37 U	38 U	41 U	220 U	18 U
Methoxychlor	µg/kg	310000	3100000	180 U	190 U	210 U	200 U	18 UJ	5.2 UJ	37 UJ	180 U	46 UJ	55 UJ	73 UJ	74 U	80 UJ	420 U	34 U
Toxaphene	µg/kg	440	1600	3700 UJ	3800 UJ	4300 UJ	4000 UJ	370 UJ	110 UJ	740 UJ	3700 UJ	940 UJ	1100 UJ	1500 UJ	1500 U	1600 UJ	8600 U	700 U
Herbicides																		
2,4,5-TP (Silvex)	µg/kg	490000	4900000	22 U	23 U	26 U	24 U	22 U	32 U	22 U	22 U	28 U	170 U	22 U	23 U	24 U	26 U	21 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	µg/kg	690000	7700000	87 U	91 U	100 U	96 U	88 U	130 U	89 U	89 U	110 UJ	670 U	88 UJ	90 UJ	96 UJ	100 U	83 U
General Chemistry																		
Cyanide (total)	mg/kg	1600	20000	0.55 U	0.57 U	0.65 U	0.60 U	0.55 U	0.79 U	0.56 U	0.28 J	0.58 J	0.84 U	0.55 U	0.56 U	0.60 U	6.0	0.74
Total solids	%	-	-	91.5	88.4	77.4	83.0	91.0	63.3	90.1	89.6	71.6	59.7	91.0	88.7	83.0	78.3	96.3

Notes:

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical value is the estimated sample quantitation limit.

- not applicable.

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TP-6	TP-6	TT-1	TT-1	TT-2	TT-2	TT-3	TT-3	TT-4	TT-4	TT-4	TT-4	TT-4	TT-4	TT-5	TT-5
Sample ID:				S-38443-100608-KMV-057	S-38443-100608-KMV-058	S-38443-092608-KMV-018	S-38443-092608-KMV-019	S-38443-092608-KMV-020	S-38443-092608-KMV-021	S-38443-092908-KMV-022	S-38443-092908-KMV-023	S-38443-092908-KMV-024	S-38443-092908-KMV-025	S-38443-092908-KMV-026	S-38443-092908-KMV-027	S-38443-092908-KMV-028	S-38443-093008-KMV-029	S-38443-093008-KMV-030
Sample Date:				10/6/2008	10/6/2008	9/26/2008	9/26/2008	9/26/2008	9/26/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/30/2008	9/30/2008
Sample Depth:				11 ft BGS	20 ft BGS	8 ft BGS	15 ft BGS	9 ft BGS	13.5 ft BGS	5 ft BGS	10 ft BGS	3 ft BGS	5 ft BGS	9 ft BGS	12 ft BGS	20 ft BGS	3 ft BGS	7 ft BGS
Parameter	*Units*	*Residential Soil Criteria a*	*Industrial Soil Criteria b*															
Volatiles																		
1,1,1-Trichloroethane	µg/kg	8700000	38000000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
1,1,2,2-Tetrachloroethane	µg/kg	560	2800	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	R	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 UJ
1,1,2-Trichloroethane	µg/kg	1100	5300	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
1,1-Dichloroethane	µg/kg	3300	17000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
1,1-Dichloroethene	µg/kg	240000	1100000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
1,2,4-Trichlorobenzene	µg/kg	22000	99000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	R	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 UJ
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	5.4	69	15 U	8.5 U	9.1 U	9.3 U	11 U	7.9 U	R	16 UJ	16 UJ	12 U	9.7 U	9.7 U	11 U	13 U	18 UJ
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	34	170	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
1,2-Dichlorobenzene	µg/kg	1900000	9800000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	R	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 UJ
1,2-Dichloroethane	µg/kg	430	2200	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
1,2-Dichloropropane	µg/kg	890	4500	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
1,3-Dichlorobenzene	µg/kg	-	-	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	R	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 UJ
1,4-Dichlorobenzene	µg/kg	2400	12000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	R	1.2 J	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 UJ
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	28000000	200000000	29 U	17 U	18 U	19 U	23 U	16 U	64 UJ	32 U	32 U	25 U	19 U	19 U	21 U	25 U	37 U
2-Hexanone	µg/kg	210000	1400000	29 U	17 U	18 U	19 U	23 U	16 U	64 UJ	32 UJ	32 UJ	25 U	19 U	19 U	21 U	25 U	37 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (M	µg/kg	5300000	53000000	29 U	17 U	18 U	19 U	23 U	16 U	64 UJ	32 U	32 U	25 U	19 U	19 U	21 U	25 U	37 U
Acetone	µg/kg	61000000	630000000	9.9 J	17 U	18 U	19 U	23 U	16 U	64 UJ	32 U	32 U	25 U	19 U	19 U	21 U	25 U	37 U
Benzene	µg/kg	1100	5400	7.3 U	0.36 J	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Bromodichloromethane	µg/kg	270	1400	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Bromoform	µg/kg	61000	220000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Bromomethane (Methyl bromide)	µg/kg	7300	32000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Carbon disulfide	µg/kg	820000	3700000	6.4 J	1.2 J	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Carbon tetrachloride	µg/kg	250	1200	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Chlorobenzene	µg/kg	290000	1400000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Chloroethane	µg/kg	15000000	61000000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Chloroform (Trichloromethane)	µg/kg	290	1500	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	0.66 J	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Chloromethane (Methyl chloride)	µg/kg	120000	500000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
cis-1,2-Dichloroethene	µg/kg	780000	10000000	7.3 U	1.7 J	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
cis-1,3-Dichloropropene	µg/kg	-	-	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Cyclohexane	µg/kg	7000000	29000000	15 U	8.5 U	9.1 U	9.3 U	11 U	7.9 U	32 UJ	16 U	16 U	12 U	9.7 U	9.7 U	11 U	13 U	18 U
Dibromochloromethane	µg/kg	680	3300	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Dichlorodifluoromethane (CFC-12)	µg/kg	180000	780000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Ethylbenzene	µg/kg	5400	27000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Isopropyl benzene	µg/kg	2100000	11000000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Methyl acetate	µg/kg	78000000	1000000000	15 U	8.5 U	9.1 U	9.3 U	11 U	7.9 U	32 UJ	16 U	16 U	12 U	9.7 U	9.7 U	11 U	13 U	18 U
Methyl cyclohexane	µg/kg	-	-	15 U	0.72 J	9.1 U	9.3 U	11 U	0.61 J	32 UJ	16 U	16 U	12 U	9.7 U	9.7 U	11 U	13 U	18 U
Methyl tert butyl ether (MTBE)	µg/kg	43000	220000	29 U	17 U	18 U	19 U	23 U	16 U	64 UJ	32 U	32 U	25 U	19 U	19 U	21 U	25 U	37 U
Methylene chloride	µg/kg	11000	53000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	29 J	7.9 U	9.3 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Styrene	µg/kg	6300000	36000000	7.3 U	4.2 UJ	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Tetrachloroethene	µg/kg	550	2600	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	4.5 J
Toluene	µg/kg	5000000	45000000	7.3 U	0.28 J	4.5 U	4.6 U	5.7 U	0.23 J	16 UJ	0.57 J	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
trans-1,2-Dichloroethene	µg/kg	150000	690000	7.3 U	0.53 J	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
trans-1,3-Dichloropropene	µg/kg	-	-	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 UJ	8.1 UJ	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Trichloroethene	µg/kg	2800	14000	7.3 U	0.68 J	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	1.0 J	4.9 J
Trichlorofluoromethane (CFC-11)	µg/kg	790000	3400000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Trifluorotrichloroethane (Freon 113)	µg/kg	43000000	180000000	7.3 U	4.2 U	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Vinyl chloride	µg/kg	60	1700	7.3 U	0.58 J	4.5 U	4.6 U	5.7 U	4.0 U	16 UJ	7.9 U	8.1 U	6.1 U	4.8 U	4.8 U	5.3 U	6.4 U	9.2 U
Xylene (total)	µg/kg	630000	2700000	15 U	1.1 J	9.1 U	1.2 J	11 U	0.98 J	32 UJ	16 UJ	16 UJ	12 U	9.7 U	9.7 U	11 U	13 U	18 U

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TP-6	TP-6	TT-1	TT-1	TT-2	TT-2	TT-3	TT-3	TT-4	TT-4	TT-4	TT-4	TT-4	TT-5	TT-5
Sample ID:				*S-39443-100608-KMV-857*	*S-39443-100608-KMV-858*	*S-39443-092608-KMV-818*	*S-39443-092608-KMV-819*	*S-39443-092608-KMV-820*	*S-39443-092608-KMV-821*	*S-39443-092908-KMV-822*	*S-39443-092908-KMV-823*	*S-39443-092908-KMV-824*	*S-39443-092908-KMV-825*	*S-39443-092908-KMV-826*	*S-39443-092908-KMV-827*	*S-39443-092908-KMV-828*	*S-39443-093008-KMV-829*	*S-39443-093008-KMV-830*
Sample Date:				10/6/2008	10/6/2008	9/26/2008	9/26/2008	9/26/2008	9/26/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/30/2008	9/30/2008
Sample Depth:				11 ft BGS	20 ft BGS	8 ft BGS	15 ft BGS	9 ft BGS	13.5 ft BGS	5 ft BGS	10 ft BGS	3 ft BGS	5 ft BGS	9 ft BGS	12 ft BGS	20 ft BGS	3 ft BGS	7 ft BGS
		Residential Soil	*Industrial Soil*															
Parameter	*Units*	*Criteria*	*Criteria*															
		a	*b*															
Semi-Volatiles																		
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopro	µg/kg	4600	22000	120 U	100 U	110 U	100 U	110 U	110 U	450 U	110 U	1100 U	270 U	100 U	110 U	110 U	1100 U	2600 U
2,4,5-Trichlorophenol	µg/kg	6100000	62000000	180 U	160 U	160 U	160 U	170 U	160 U	670 U	160 U	1700 U	400 U	160 U	170 U	160 U	1600 U	4000 U
2,4,6-Trichlorophenol	µg/kg	44000	160000	180 U	160 U	160 U	160 U	170 U	160 U	670 U	160 U	1700 U	400 U	160 U	170 U	160 U	1600 U	4000 U
2,4-Dichlorophenol	µg/kg	180000	1800000	180 U	160 U	160 U	160 U	170 U	160 U	670 U	160 U	1700 U	400 U	160 U	170 U	160 U	1600 U	4000 U
2,4-Dimethylphenol	µg/kg	1200000	12000000	180 U	160 U	160 U	160 U	170 U	160 U	670 U	160 U	1700 U	400 U	160 U	170 U	160 U	1600 U	4000 U
2,4-Dinitrophenol	µg/kg	120000	1200000	410 U	340 U	360 U	340 U	370 U	350 U	1500 U	360 U	3700 UJ	890 U	340 U	370 U	360 U	3500 U	8700 U
2,4-Dinitrotoluene	µg/kg	1600	5500	250 U	210 U	220 U	210 U	220 U	210 U	900 U	220 U	2200 U	540 U	210 U	220 U	220 U	2100 U	5300 U
2,6-Dinitrotoluene	µg/kg	61000	620000	250 U	210 U	220 U	210 U	220 U	210 U	900 U	220 U	2200 U	540 U	210 U	220 U	220 U	2100 U	5300 U
2-Chloronaphthalene	µg/kg	6300000	82000000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
2-Chlorophenol	µg/kg	390000	5100000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
2-Methylnaphthalene	µg/kg	310000	4100000	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	7.2 U	38	25	75 U	22	7.0 U	7.5 U	7.2 U	81	180 U
2-Methylphenol	µg/kg	3100000	31000000	250 UJ	210 UJ	220 U	210 U	220 U	210 U	900 U	220 U	2200 U	540 U	210 U	220 U	220 U	2100 U	5300 U
2-Nitroaniline	µg/kg	610000	6000000	250 U	210 U	220 U	210 U	220 U	210 U	900 U	220 U	2200 U	540 U	210 U	220 U	220 U	2100 U	5300 U
2-Nitrophenol	µg/kg	-	-	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
3,3'-Dichlorobenzidine	µg/kg	1100	3800	120 U	100 U	110 U	100 U	110 U	110 U	450 U	110 U	1100 U	270 U	100 U	110 U	110 U	1100 U	2600 U
3-Nitroaniline	µg/kg	-	-	250 U	210 U	220 U	210 U	220 U	210 U	900 U	220 U	2200 U	540 U	210 U	220 U	220 U	2100 U	5300 U
4,6-Dinitro-2-methylphenol	µg/kg	6100	62000	180 U	160 U	160 U	160 U	170 U	160 U	670 U	160 U	1700 U	400 U	160 U	170 U	160 U	1600 U	4000 U
4-Bromophenyl phenyl ether	µg/kg	-	-	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
4-Chloro-3-methylphenol	µg/kg	6100000	62000000	180 U	160 U	160 U	160 U	170 U	160 U	670 U	160 U	1700 U	400 U	160 U	170 U	160 U	1600 U	4000 U
4-Chloroaniline	µg/kg	2400	8600	180 U	160 U	160 U	160 U	170 U	160 U	670 U	160 U	1700 U	400 U	160 U	170 U	160 U	1600 U	4000 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
4-Methylphenol	µg/kg	310000	3100000	250 U	210 U	220 U	210 U	220 U	210 U	900 U	220 U	2200 U	540 U	210 U	220 U	220 U	2100 U	5300 U
4-Nitroaniline	µg/kg	24000	86000	250 U	210 U	220 U	210 U	220 U	210 U	900 U	220 U	2200 U	540 U	210 U	220 U	220 U	2100 U	5300 U
4-Nitrophenol	µg/kg	-	-	410 U	340 U	360 U	340 U	370 U	350 U	1500 U	360 U	3700 U	890 U	340 U	370 U	360 U	3500 U	8700 U
Acenaphthene	µg/kg	3400000	33000000	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	7.2 U	30 U	7.2 U	77	110	7.0 U	7.5 U	7.2 U	140	180 U
Acenaphthylene	µg/kg	-	-	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	7.2 U	30 U	9.5	100	18 U	7.0 U	7.5 U	7.2 U	180	180 U
Acetophenone	µg/kg	7800000	100000000	120 U	100 U	110 U	100 U	110 U	110 U	450 U	110 U	1100 U	270 U	100 U	110 U	110 U	1100 U	2600 U
Anthracene	µg/kg	17000000	170000000	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	7.2 U	30 U	22	620	470	7.0 U	7.5 U	8.3	800	180 U
Atrazine	µg/kg	2100	7500	250 U	210 U	220 U	210 U	220 U	210 U	900 U	220 U	2200 U	540 U	210 U	220 U	220 U	2100 U	5300 U
Benzaldehyde	µg/kg	7800000	100000000	120 U	100 U	110 U	100 U	110 U	110 U	450 U	110 U	1100 U	270 U	100 U	110 U	110 U	1100 U	2600 U
Benzo(a)anthracene	µg/kg	150	2100	8.2 U	6.9 U	15	6.9 U	18	22	30 U	85	1700*	790*	8.0	27	24	5300*	280*
Benzo(a)pyrene	µg/kg	15	210	8.2 U	6.9 U	15	6.9 U	16*	22*	30 U	88*	850*	540*	7.4	23*	22*	4000*	270*
Benzo(b)fluoranthene	µg/kg	150	2100	8.2 U	6.9 U	21	7.1	20	28	36	140	2900*	730*	12	61	33	8700*	590*
Benzo(g,h,i)perylene	µg/kg	-	-	8.2 U	6.9 U	15	6.9 U	13	16	30 U	91	950	330	7.0 U	31	17	3400	240
Benzo(k)fluoranthene	µg/kg	1500	21000	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	15	30 U	40	870	320	7.0 U	19	12	2900*	180 U
Biphenyl (1,1-Biphenyl)	µg/kg	3900000	51000000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
bis(2-Chloroethoxy)methane	µg/kg	180000	1800000	120 U	100 U	110 U	100 U	110 U	110 U	450 U	110 U	1100 U	270 U	100 U	110 U	110 U	1100 U	2600 U
bis(2-Chloroethyl)ether	µg/kg	210	1000	120 U	100 U	110 U	100 U	110 U	110 U	450 U	110 U	1100 U	270 U	100 U	110 U	110 U	1100 U	2600 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/kg	35000	120000	62 U	52 U	54 U	52 U	25 J	54 U	160 J	76	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
Butyl benzylphthalate (BBP)	µg/kg	260000	910000	62 U	52 U	54 U	52 U	56 U	54 U	690	630	1100	130 U	52 U	240	54 U	310 J	1300 U
Caprolactam	µg/kg	31000000	310000000	410 U	340 U	360 U	340 U	370 U	350 U	1500 U	360 U	3700 U	890 U	340 U	370 U	360 U	3500 U	8700 U
Carbazole	µg/kg	-	-	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	210 J	260	52 U	56 U	54 U	530 U	1300 U
Chrysene	µg/kg	15000	210000	8.2 U	6.9 U	19	6.9 U	19	27	34	120	2800	760	8.1	47	26	5700	240
Dibenz(a,h)anthracene	µg/kg	15	210	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	7.2 U	30 U	15	200*	68*	7.0 U	7.5 U	7.2 U	1250*	180 U
Dibenzofuran	µg/kg	78000	1000000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	80 J	52 U	56 U	54 U	530 U	1300 U
Diethyl phthalate	µg/kg	49000000	490000000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
Dimethyl phthalate	µg/kg	-	-	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
Di-n-butylphthalate (DBP)	µg/kg	6100000	62000000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	100	560	130 U	52 U	47 J	54 U	530 U	1300 U
Di-n-octyl phthalate (DnOP)	µg/kg	-	-	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
Fluoranthene	µg/kg	2300000	22000000	8.2 U	6.9 U	24	8.9	28	43	61	190	3000	2200	14	39	47	10000	320
Fluorene	µg/kg	2300000	22000000	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	7.2 U	30 U	7.3	90	140	7.0 U	7.5 U	7.2 U	94	180 U
Hexachlorobenzene	µg/kg	300	1100	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	7.2 U	30 U	7.2 U	75 U	18 U	7.0 U	7.5 U	7.2 U	70 U	180 U
Hexachlorobutadiene	µg/kg	6200	22000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
Hexachlorocyclopentadiene	µg/kg	370000	3700000	410 U	340 U	360 U	340 U	370 U	R	1500 U	360 U	3700 U	890 U	340 U	370 U	360 U	3500 U	8700 U
Hexachloroethane	µg/kg	35000	120000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
Indeno(1,2,3-cd)pyrene	µg/kg	150	2100	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	14	30 U	54	800*	270*	7.0 U	24	15	3800*	220*
Isophorone	µg/kg	510000	1800000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
Naphthalene	µg/kg	3600	18000	8.2 U	6.9 U	7.2 U	6.9 U	7.5 U	7.2 U	30 U	19	75 U	43	7.0 U	7.5 U	13	70 U	180 U
Nitrobenzene	µg/kg	4800	24000	120 U	100 U	110 U	100 U	110 U	110 U	450 U	110 U	1100 U	270 U	100 U	110 U	110 U	1100 U	2600 U
N-Nitrosodi-n-propylamine	µg/kg	69	250	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
N-Nitrosodiphenylamine	µg/kg	99000	350000	62 U	53	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
Pentachlorophenol	µg/kg	3000	9000	180 U	160 U	160 U	160 U	170 U	160 U	670 U	110 J	1700 U	400 U	160 U	170 U	160 U	1600 U	4000 U
Phenanthrene	µg/kg	-	-	8.2 U	6.9 U	10	6.9 U	7.9	20	39	100	970	1900	7.0 U	10	38	1900	180 U
Phenol	µg/kg	18000000	180000000	62 U	52 U	54 U	52 U	56 U	54 U	220 U	54 U	560 U	130 U	52 U	56 U	54 U	530 U	1300 U
Pyrene	µg/kg	1700000	17000000	8.2 U	6.9 U	23	7.9	30	39	75	160	2400	1600	12	36	39	9200	290

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TP-6	TP-6	TT-1	TT-1	TT-2	TT-2
Sample ID:				S-38443-100608-KMV-057	S-38443-100608-KMV-058	S-38443-092608-KMV-018	S-38443-092608-KMV-019	S-38443-092608-KMV-020	S-38443-092608-KMV-021
Sample Date:				10/6/2008	10/6/2008	9/26/2008	9/26/2008	9/26/2008	9/26/2008
Sample Depth:				11 ft BGS	20 ft BGS	8 ft BGS	15 ft BGS	9 ft BGS	13.5 ft BGS
Parameter	Units	Residential Soil Criteria a	Industrial Soil Criteria b						
Metals									
Aluminum	mg/kg	77000	990000	7400	2140	9680	2920	8230	6660
Antimony	mg/kg	31	410	1.7 J	6.2 UJ	1.0 J	12.8 J	0.51 J	1.6 J
Arsenic	mg/kg	0.39	1.6	11.7 [ab]	4.0 [ab]	8.4 J [ab]	14.1 J [ab]	8.1 J [ab]	7.3 J [ab]
Barium	mg/kg	15000	190000	1380	26.9	148	342	61.5	84.2
Beryllium	mg/kg	160	2000	0.26 J	0.52 U	0.40 J	0.52 U	0.30 J	0.24 J
Cadmium	mg/kg	70	800	4.2 J	0.35 J	0.26 J	0.14 J	0.27 J	0.31 J
Calcium	mg/kg	-	-	146000	131000	35600	110000	22700	51600
Chromium	mg/kg	-	-	36.8 J	5.2 J	12.8 J	5.6 J	13.4 J	11.2 J
Cobalt	mg/kg	23	300	2.9 J	2.5 J	3.2 J	2.1 J	6.9 J	4.6 J
Copper	mg/kg	3100	41000	900 J	13.4 J	14.2	19.1	13.8	15.4
Iron	mg/kg	55000	720000	25300	7220	15600	6340	15300	14300
Lead	mg/kg	400	800	546 [a]	25.1	12.9	5.4 J	15.3	11.4
Magnesium	mg/kg	-	-	40300	44600	14200	38300	14700	22900
Manganese	mg/kg	1800	23000	333 J	211 J	489	241	437	416
Mercury	mg/kg	5.6	34	1.3	0.030 J	0.021 J	0.33	0.043 J	0.016 J
Nickel	mg/kg	1500	20000	20.2 J	6.5 J	12.9	6.4	16.3	11.8
Potassium	mg/kg	-	-	1270	459 J	876	641	733	874
Selenium	mg/kg	390	5100	30.8 U	25.9 U	26.9 U	26.0 U	28.1 U	26.8 U
Silver	mg/kg	390	5100	1.7	1.0 U	1.1 U	1.0 U	1.1 U	1.1 U
Sodium	mg/kg	-	-	1120	175 J	539 U	520 U	562 U	536 U
Thallium	mg/kg	-	-	0.12 U	0.10 U	0.13	0.10 U	0.11 U	0.12
Vanadium	mg/kg	390	5200	20.9	8.2	22.8	8.6	23.1	18.7
Zinc	mg/kg	23000	310000	816	230	54.2 J	23.0 J	54.8 J	48.1 J
PCBs									
Aroclor-1016 (PCB-1016)	µg/kg	3900	21000	41 U	34 U	36 U	34 U	37 U	35 U
Aroclor-1221 (PCB-1221)	µg/kg	140	540	41 U	34 U	36 U	34 U	37 U	35 U
Aroclor-1232 (PCB-1232)	µg/kg	140	540	41 U	34 U	36 U	34 U	37 U	35 U
Aroclor-1242 (PCB-1242)	µg/kg	220	740	41 U	34 U	36 U	34 U	37 U	35 U
Aroclor-1248 (PCB-1248)	µg/kg	220	740	41 U	34 U	36 U	34 U	37 U	35 U
Aroclor-1254 (PCB-1254)	µg/kg	220	740	41 UJ	34 UJ	36 U	34 U	37 U	35 U
Aroclor-1260 (PCB-1260)	µg/kg	220	740	41 UJ	34 UJ	36 U	34 U	37 U	35 U
Pesticides									
4,4'-DDD	µg/kg	2000	7200	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
4,4'-DDE	µg/kg	1400	9100	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
4,4'-DDT	µg/kg	1700	7000	2.1 UJ	8.8 UJ	18 U	18 U	9.6 U	9.1 U
Aldrin	µg/kg	29	100	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
alpha-BHC	µg/kg	77	270	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
alpha-Chlordane	µg/kg	-	-	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
beta-BHC	µg/kg	270	960	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
delta-BHC	µg/kg	-	-	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Dieldrin	µg/kg	30	110	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Endosulfan I	µg/kg	-	-	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Endosulfan II	µg/kg	-	-	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Endosulfan sulfate	µg/kg	-	-	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Endrin	µg/kg	18000	180000	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Endrin aldehyde	µg/kg	-	-	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Endrin ketone	µg/kg	-	-	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
gamma-BHC (lindane)	µg/kg	520	2100	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
gamma-Chlordane	µg/kg	-	-	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Heptachlor	µg/kg	110	380	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Heptachlor epoxide	µg/kg	53	190	2.1 U	8.8 U	18 U	18 U	9.6 U	9.1 U
Methoxychlor	µg/kg	310000	3100000	4.1 U	17 U	36 U	34 U	19 U	18 U
Toxaphene	µg/kg	440	1600	82 U	350 U	720 U	700 U	380 U	360 U
Herbicides									
2,4,5-TP (Silvex)	µg/kg	490000	4900000	25 U	21 U	22 U	21 U	22 U	21 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	µg/kg	690000	7700000	98 U	83 U	86 UJ	83 UJ	90 UJ	86 UJ
General Chemistry									
Cyanide (total)	mg/kg	1600	20000	0.62 U	0.52 U	0.54 U	0.52 U	0.56 U	0.54 U
Total solids	%	-	-	81.2	96.7	92.8	96.1	89.0	93.3

Sample Location:	TT-3	TT-3	TT-4	TT-4	TT-4	TT-4	TT-4	TT-5	TT-5
Sample ID:	S-38443-092908-KMV-022	S-38443-092908-KMV-023	S-38443-092908-KMV-024	S-38443-092908-KMV-025	S-38443-092908-KMV-026	S-38443-092908-KMV-027	S-38443-092908-KMV-028	S-38443-093008-KMV-029	S-38443-093008-KMV-030
Sample Date:	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/29/2008	9/30/2008	9/30/2008
Sample Depth:	5 ft BGS	10 ft BGS	3 ft BGS	5 ft BGS	9 ft BGS	12 ft BGS	20 ft BGS	3 ft BGS	7 ft BGS
Parameter									
Metals									
Aluminum	5080	4190	6760	4300	3330	7310	2000	2640	9700
Antimony	4.0 J	1.5 J	199 J [a]	8.2 J	1.1 J	1.8 J	0.85 J	29.1 J	449 J [ab]
Arsenic	22.7 [ab]	11.3 [ab]	37.3 [ab]	17.3 [ab]	5.5 [ab]	8.3 [ab]	3.5 [ab]	8.6 [ab]	29.7 [ab]
Barium	535	224	1030	139	47.9	124	23.7	159	423
Beryllium	3.9 J	0.89 J	1.5 J	0.55 J	0.058 J	0.32 J	0.54 U	0.27 J	0.36 J
Cadmium	1.6	15.1	30.5	1.4	0.21 J	0.43 J	0.14 J	2.6	34.2
Calcium	11000 J	30300 J	39200 J	217000 J	95800 J	48900 J	108000 J	120000 J	7780 J
Chromium	11.0	19.5	74.0	12.9	7.5	11.2	4.6	20.2	138
Cobalt	8.1	4.8 J	14.7	4.8 J	3.6 J	5.7	2.5 J	4.7 J	22.5
Copper	186	181	43400 [ab]	69.1	49.8	34.6	17.7	2360	10800 [a]
Iron	8230	10500	82400 [a]	8180	10100	15700	6470	14300	121000 [a]
Lead	116 J	426 J [a]	3970 J [ab]	72.1 J	17.0 J	32.8 J	12.3 J	484 J [a]	14100 J [ab]
Magnesium	1750	13600	20800	9140	32900	22600	45700	58700	14000
Manganese	80.3 J	184 J	533 J	165 J	252 J	609 J	236 J	220 J	1490 J
Mercury	0.16	0.17	0.84	0.089 J	0.017 J	0.052 J	0.11 U	0.49	0.69
Nickel	17.9	19.1	129	13.6	9.7	16.4	5.8	56.8	475
Potassium	800 J	503 J	1020 J	637 J	543 J	990 J	335 J	541 J	1850 J
Selenium	1.7 J	0.85 J	20.1 J	0.90 J	26.1 U	28.1 U	26.9 U	0.66 J	331 U
Silver	0.34 J	0.22 J	3.1	0.37 J	1.0 U	1.1 U	1.1 U	0.50 J	5.5
Sodium	135 J	99.1 J	592	112 J	81.1 J	561 U	125 J	242 J	3110
Thallium	0.63	0.29	5.6 U	0.41	0.11 U	0.20 U	0.11 U	0.13 U	26.4 U
Vanadium	28.2 J	15.2 J	35.7 J	17.2 J	12.8 J	18.8 J	9.6 J	12.1 J	51.8 J
Zinc	165 J	230 J	3070 J	115 J	38.6 J	67.6 J	30.1 J	640 J	21900 J
PCBs									
Aroclor-1016 (PCB-1016)	36 U	36 U	37 U	35 U	34 UJ	37 UJ	36 UJ	35 U	44 U
Aroclor-1221 (PCB-1221)	36 U	36 U	37 U	35 U	34 UJ	37 UJ	36 UJ	35 U	44 U
Aroclor-1232 (PCB-1232)	36 U	36 U	37 U	35 U	34 UJ	37 UJ	36 UJ	35 U	44 U
Aroclor-1242 (PCB-1242)	36 U	36 U	37 U	35 U	34 UJ	37 UJ	36 UJ	35 U	44 U
Aroclor-1248 (PCB-1248)	36 U	36 U	37 U	35 U	34 UJ	37 UJ	36 UJ	35 U	44 U
Aroclor-1254 (PCB-1254)	36 U	36 U	37 U	52	34 UJ	37 UJ	36 UJ	230 [a]	516 [a]
Aroclor-1260 (PCB-1260)	280 [a]	230 [a]	530 J [a]	35 U	34 UJ	23 J	36 UJ	35 U	44 U
Pesticides									
4,4'-DDD	37 UJ	92 U	190 U	91 U	18 UJ	38 U	18 UJ	180 UJ	110 UJ
4,4'-DDE	10 J	40 J	51 J	24 J	18 U	38 U	18 U	52 J	110 U
4,4'-DDT	37 UJ	36 J	820	43 J	18 UJ	22 J	18 UJ	180 UJ	110 UJ
Aldrin	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
alpha-BHC	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
alpha-Chlordane	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
beta-BHC	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
delta-BHC	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
Dieldrin	20 J	92 U	65 J [a]	91 U	18 U	38 U	18 U	180 U	110 U
Endosulfan I	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
Endosulfan II	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
Endosulfan sulfate	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
Endrin	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
Endrin aldehyde	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
Endrin ketone	37 U	92 U	89 J	91 U	18 U	38 U	18 U	180 U	110 U
gamma-BHC (lindane)	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
gamma-Chlordane	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
Heptachlor	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
Heptachlor epoxide	37 U	92 U	190 U	91 U	18 U	38 U	18 U	180 U	110 U
Methoxychlor	72 UJ	180 U	370 U	180 U	34 UJ	74 U	36 UJ	360 UJ	220 UJ
Toxaphene	1500 UJ	3600 U	7500 U	3600 U	700 UJ	1500 U	720 UJ	7100 UJ	4400 UJ
Herbicides									
2,4,5-TP (Silvex)	4.6 J	22 U	22 U	22 U	21 U	22 U	22 U	21 U	26 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	87 U	86 U	90 U	86 U	83 U	90 U	86 U	84 U	110 U
General Chemistry									
Cyanide (total)	0.46 J	0.37 J	0.90	2.1	0.52 U	0.56 U	0.45 J	0.31 J	0.79 J
Total solids	92.2	92.6	88.9	93.0	95.9	89.1	93.0	95.0	75.6

Notes:

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TT-5	TT-5	TT-5	TT-7	TT-7	TT-8	TT-8	TT-8	TT-9	TT-9	TT-9	TT-10	TT-10	TT-10
Sample ID:				S-38443-083008-KMV-031	S-38443-083008-KMV-031-D	S-38443-083008-KMV-032	S-38443-100708-KMV-061	S-38443-100708-KMV-063	S-38443-100608-KMV-059	S-38443-100608-KMV-059-D	S-38443-100608-KMV-057	S-38443-100308-KMV-047	S-38443-100308-KMV-048	S-38443-100308-KMV-049	S-38443-100308-KMV-044	S-38443-100308-KMV-045	S-38443-100308-KMV-046
Sample Date:				9/30/2008	9/30/2008	9/30/2008	10/7/2008	10/7/2008	10/6/2008	10/6/2008	10/6/2008	10/3/2008	10/3/2008	10/3/2008	10/3/2008	10/3/2008	10/3/2008
Sample Depth:				14 ft BGS	14 ft BGS	17 ft BGS	6 ft BGS	14 ft BGS	4 ft BGS	4 ft BGS	15 ft BGS	7 ft BGS	17 ft BGS	22 ft BGS	5 ft BGS	10 ft BGS	15 ft BGS
		Residential Soil	*Industrial Soil*		*Duplicate*					*Duplicate*							
Parameter	*Units*	*Criteria*	*Criteria*														
		a	*b*														
Volatiles																	
1,1,1-Trichloroethane	µg/kg	8700000	38000000	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
1,1,2,2-Tetrachloroethane	µg/kg	560	2800	9.2 UJ	7.7 UJ	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	R	R
1,1,2-Trichloroethane	µg/kg	1100	5300	9.2 UJ	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	14 UJ	13 UJ
1,1-Dichloroethane	µg/kg	3300	17000	9.2 U	7.7 U	5.3 U	1800 U	280 U	5.8 J	36 J	1.1 J	240 J	46 J	2600 U	12 U	14 UJ	13 UJ
1,1-Dichloroethene	µg/kg	240000	1100000	9.2 U	7.7 U	5.3 U	1800 U	280 U	0.89 J	4.6 J	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
1,2,4-Trichlorobenzene	µg/kg	22000	99000	9.2 UJ	7.7 UJ	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	R	R
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	5.4	69	18 UJ	15 UJ	11 U	3600 U	560 U	12 U	13 UJ	9.4 U	1200 U	1400 U	5300 U	24 UJ	R	R
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	34	170	9.2 UJ	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	14 UJ	13 UJ
1,2-Dichlorobenzene	µg/kg	1900000	9800000	9.2 UJ	7.7 UJ	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	R	R
1,2-Dichloroethane	µg/kg	430	2200	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
1,2-Dichloropropane	µg/kg	890	4500	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
1,3-Dichlorobenzene	µg/kg	-	-	9.2 UJ	7.7 UJ	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	2.4 J	R
1,4-Dichlorobenzene	µg/kg	2400	12000	9.2 UJ	7.7 UJ	5.3 U	89 J	19 J	6.2 U	6.3 UJ	4.7 U	100 J	680 U	2600 U	2.6 J	8.6 J	4.2 J
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	28000000	200000000	37 U	31 U	21 U	7100 U	1100 U	12 J	25 U	2.8 J	130 J	200 J	11000 U	48 U	57 UJ	53 UJ
2-Hexanone	µg/kg	210000	1400000	37 UJ	31 U	21 U	7100 U	1100 U	25 U	25 UJ	19 U	2300 U	2700 U	11000 U	48 UJ	57 UJ	53 UJ
4-Methyl-2-pentanone (Methyl isobutyl ketone) (M	µg/kg	5300000	53000000	37 U	31 U	21 U	7100 U	1100 U	25 U	25 U	19 U	1000 J	860 J	11000 U	48 U	57 UJ	53 UJ
Acetone	µg/kg	61000000	630000000	37 U	31 U	21 U	7100 U	1100 U	62	25 UJ	14 J	2300 U	2700 U	11000 U	R	38 J	33 J
Benzene	µg/kg	1100	5400	9.2 U	7.7 U	5.3 U	1800 U	94 J	1.3 J	2.0 J	4.7 U	150 J	130 J	2600 U	12 U	14 UJ	13 UJ
Bromodichloromethane	µg/kg	270	1400	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
Bromoform	µg/kg	61000	220000	9.2 UJ	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	14 UJ	13 UJ
Bromomethane (Methyl bromide)	µg/kg	7300	32000	9.2 U	7.7 U	5.3 U	1800 UJ	280 UJ	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
Carbon disulfide	µg/kg	820000	3700000	9.2 U	7.7 U	5.3 U	1800 U	280 U	2.7 J	0.83 J	4.7 U	580 U	110 J	2600 U	12 U	14 UJ	13 UJ
Carbon tetrachloride	µg/kg	250	1200	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
Chlorobenzene	µg/kg	290000	1400000	9.2 UJ	7.7 U	5.3 U	47000	1900	6.2 U	6.3 UJ	4.7 U	4000	2000	720 J	12 UJ	14 UJ	13 UJ
Chloroethane	µg/kg	15000000	61000000	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	4.3 J	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
Chloroform (Trichloromethane)	µg/kg	290	1500	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
Chloromethane (Methyl chloride)	µg/kg	120000	500000	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
cis-1,2-Dichloroethene	µg/kg	780000	10000000	9.2 U	7.7 U	0.62 J	1800 U	20 J	4.5 J	21 J	0.63 J	890	590 J	330 J	12 U	14 UJ	13 UJ
cis-1,3-Dichloropropene	µg/kg	-	-	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
Cyclohexane	µg/kg	7000000	28000000	18 U	15 U	11 U	3600 U	560 U	12 U	0.74 J	9.4 U	1200 U	160 J	5300 U	24 U	29 UJ	27 UJ
Dichlorobromomethane	µg/kg	680	3300	9.2 UJ	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	14 UJ	13 UJ
Dichlorodifluoromethane (CFC-12)	µg/kg	180000	780000	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
Ethylbenzene	µg/kg	5400	27000	9.2 UJ	7.7 U	5.3 U	220 J	28 J	6.2 U	6.3 UJ	4.7 U	13000*	7600*	60000*	12 UJ	14 UJ	13 UJ
Isopropyl benzene	µg/kg	2100000	11000000	9.2 UJ	7.7 U	5.3 U	1800 U	81 J	6.2 U	6.3 UJ	4.7 U	110 J	2500	2800	12 UJ	14 UJ	13 UJ
Methyl acetate	µg/kg	78000000	1000000000	18 U	15 U	11 U	3600 U	140 J	12 U	13 U	9.4 U	190 J	1300 J	5300 U	24 U	29 UJ	27 UJ
Methyl cyclohexane	µg/kg	-	-	18 U	15 U	0.82 J	3600 U	59 J	5.5 J	42 J	0.84 J	250 J	1100 J	530 J	24 U	29 UJ	27 UJ
Methyl tert butyl ether (MTBE)	µg/kg	43000	220000	37 U	31 U	21 U	7100 U	1100 U	25 U	0.62 J	19 U	2300 U	2700 U	11000 U	48 U	57 UJ	53 UJ
Methylene chloride	µg/kg	11000	53000	9.2 U	7.7 U	5.3 U	1800 U	190 J	6.2 U	6.3 U	4.7 U	260 J	680 U	2600 U	1.9 J	18 J	18 J
Styrene	µg/kg	6300000	36000000	9.2 UJ	7.7 U	5.3 U	1800 UJ	280 UJ	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	14 UJ	13 UJ
Tetrachloroethene	µg/kg	550	2600	20 J	1.9 J	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	4.8 J	4.7 J
Toluene	µg/kg	5000000	45000000	9.2 UJ	7.7 U	0.61 J	1800 U	33 J	0.65 J	3.2 J	4.7 U	5300	990	450 J	1.1 J	1.7 J	1.0 J
trans-1,2-Dichloroethene	µg/kg	150000	690000	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
trans-1,3-Dichloropropene	µg/kg	-	-	9.2 UJ	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 UJ	4.7 U	580 U	680 U	2600 U	12 UJ	14 UJ	13 UJ
Trichloroethene	µg/kg	2800	14000	9.7	3.3 J	1.7 J	1800 U	240 J	6.7	5.3 J	4.7 U	350 J	670 J	420 J	12 U	14 UJ	13 UJ
Trichlorofluoromethane (CFC-11)	µg/kg	790000	3400000	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
Trifluorotrichloroethane (Freon 113)	µg/kg	43000000	180000000	9.2 U	7.7 U	5.3 U	1800 U	280 U	6.2 U	6.3 U	4.7 U	580 U	680 U	2600 U	12 U	14 UJ	13 UJ
Vinyl chloride	µg/kg	60	1700	9.2 U	7.7 U	5.3 U	1800 U	280 U	5.5 J	54 J	4.7 U	220 J*	180 J*	2600 U	12 U	14 UJ	13 UJ
Xylene (total)	µg/kg	630000	2700000	18 UJ	15 U	11 U	710 J	140 J	1.7 J	13 UJ	1.1 J	27000	17000	140000	24 UJ	29 UJ	27 UJ

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				*TT-5*	*TT-5*	*TT-5*	*TT-7*	*TT-7*	*TT-8*	*TT-8*	*TT-8*	*TT-8*	*TT-9*	*TT-9*	*TT-9*	*TT-10*	*TT-10*	*TT-10*
Sample ID:				*S-38443-003008-KMV-031*	*S-38443-003008-KMV-031-D*	*S-38443-003008-KMV-032*	*S-38443-100708-KMV-061*	*S-38443-100708-KMV-063*	*S-38443-100608-KMV-050*	*S-38443-100608-KMV-050-D*	*S-38443-100608-KMV-051*	*S-38443-100308-KMV-047*	*S-38443-100308-KMV-048*	*S-38443-100308-KMV-049*	*S-38443-100308-KMV-044*	*S-38443-100308-KMV-045*	*S-38443-100308-KMV-046*
Sample Date:				*9/30/2008*	*9/30/2008*	*9/30/2008*	*10/7/2008*	*10/7/2008*	*10/6/2008*	*10/6/2008*	*10/6/2008*	*10/3/2008*	*10/3/2008*	*10/3/2008*	*10/3/2008*	*10/3/2008*	*10/3/2008*
Sample Depth:		*Residential Soil*	*Industrial Soil*	*14 ft BGS*	*14 ft BGS*	*17 ft BGS*	*6 ft BGS*	*16 ft BGS*	*4 ft BGS*	*4 ft BGS*	*15 ft BGS*	*7 ft BGS*	*17 ft BGS*	*22 ft BGS*	*5 ft BGS*	*10 ft BGS*	*15 ft BGS*
					Duplicate					*Duplicate*							
Parameter	*Units*	*Criteria a*	*Criteria b*														
Semi-Volatiles																	
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopro	µg/kg	4600	22000	1400 U	2200 U	110 U	2600 U	840 U	290 U	450 U	100 U	1300 U	190 U	2800 U	120 U	150 U	160 U
2,4,5-Trichlorophenol	µg/kg	6100000	62000000	2100 U	3300 U	170 U	3900 U	1300 U	440 U	680 U	160 U	1900 U	290 U	4200 U	180 U	230 U	230 U
2,4,6-Trichlorophenol	µg/kg	44000	160000	2100 U	3300 U	170 U	3900 U	1300 U	440 U	680 U	160 U	1900 U	290 U	4200 U	180 U	230 U	230 U
2,4-Dichlorophenol	µg/kg	180000	1800000	2100 U	3300 U	170 U	3900 U	1300 U	440 U	680 U	160 U	1900 U	290 U	4200 U	180 U	230 U	230 U
2,4-Dimethylphenol	µg/kg	1200000	12000000	2100 U	3300 U	170 U	3900 U	1300 U	440 U	680 U	160 U	1900 U	290 U	4200 U	180 U	230 U	R
2,4-Dinitrophenol	µg/kg	120000	1200000	4600 U	7400 U	370 U	8500 U	2800 U	960 U	1500 U	340 U	4200 U	630 U	9300 U	400 U	500 U	510 U
2,4-Dinitrotoluene	µg/kg	1600	5500	2800 U	4500 U	220 U	5100 U	1700 U	580 U	910 U	210 U	2600 U	380 U	5600 U	240 U	300 U	310 U
2,6-Dinitrotoluene	µg/kg	61000	620000	2800 U	4500 U	220 U	5100 U	1700 U	580 U	910 U	210 U	2600 U	380 U	5600 U	240 U	300 U	310 U
2-Chloronaphthalene	µg/kg	6300000	82000000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
2-Chlorophenol	µg/kg	390000	5100000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
2-Methylnaphthalene	µg/kg	310000	4100000	210	170	7.4 U	300	56 U	19 U	30 U	6.9 U	470	13 U	5400	36	10 U	19
2-Methylphenol	µg/kg	3100000	31000000	2800 U	4500 U	220 U	5100 UJ	1700 U	580 UJ	910 UJ	210 UJ	2600 U	380 U	5600 U	240 U	300 U	310 U
2-Nitroaniline	µg/kg	610000	6000000	2800 U	4500 U	220 U	5100 U	1700 U	580 U	910 U	210 U	2600 U	380 U	5600 U	240 U	300 U	310 U
2-Nitrophenol	µg/kg	-	-	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
3,3'-Dichlorobenzidine	µg/kg	1100	3800	1400 U	2200 U	110 U	2600 U	840 U	290 U	450 U	100 U	1300 U	190 U	2800 U	120 U	150 U	160 U
3-Nitroaniline	µg/kg	-	-	2800 U	4500 U	220 U	5100 U	1700 U	580 U	910 U	210 U	2600 U	380 U	5600 U	240 U	300 U	310 U
4,6-Dinitro-2-methylphenol	µg/kg	6100	62000	2100 U	3300 U	170 U	3900 U	1300 U	440 U	680 U	160 U	1900 U	290 U	4200 U	180 U	230 U	230 U
4-Bromophenyl phenyl ether	µg/kg	-	-	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
4-Chloro-3-methylphenol	µg/kg	6100000	62000000	2100 U	3300 U	170 U	3900 U	1300 U	440 U	680 U	160 U	1900 U	290 U	4200 U	180 U	230 U	230 U
4-Chloroaniline	µg/kg	2400	8600	2100 U	3300 U	170 U	3900 U	1300 U	440 U	680 U	160 U	1900 U	290 U	4200 U	180 U	230 U	230 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
4-Methylphenol	µg/kg	310000	3100000	2800 U	4500 U	220 U	5100 U	1700 U	580 U	910 U	210 U	2600 U	380 U	5600 U	240 U	300 U	310 U
4-Nitroaniline	µg/kg	24000	86000	2800 U	4500 U	220 U	5100 U	1700 U	580 U	910 U	210 U	2600 U	380 U	5600 U	240 U	300 U	310 U
4-Nitrophenol	µg/kg	-	-	4600 U	7400 U	370 U	8500 U	2800 U	960 U	1500 U	340 U	4200 U	630 U	9300 U	400 U	500 U	510 U
Acenaphthene	µg/kg	3400000	33000000	1500	1400	7.4 U	2600	1700	19 U	30 U	6.9 U	85 U	13 U	190 U	8.1 U	10 U	10 U
Acenaphthylene	µg/kg	-	-	92 U	150 U	7.4 U	170 U	56 U	19 U	30 U	6.9 U	85 U	13 U	190 U	8.1 U	10 U	10 U
Acetophenone	µg/kg	7800000	100000000	1400 U	2200 U	110 U	2600 U	840 U	290 U	450 U	100 U	1300 U	190 U	2800 U	120 U	150 U	160 UJ
Anthracene	µg/kg	17000000	170000000	3300	3200	7.4 U	2900	2000	19 U	30 U	6.9 U	85 U	13 U	190 U	8.1 U	10 U	10 U
Atrazine	µg/kg	2100	7500	2800 U	4500 U	220 U	5100 U	1700 U	580 U	910 U	210 U	2600 U	380 U	5600 U	240 U	300 U	310 U
Benzaldehyde	µg/kg	7800000	100000000	1400 U	2200 U	110 U	2600 U	840 U	290 U	450 U	100 U	1300 U	190 U	2800 U	120 U	150 U	160 U
Benzo(a)anthracene	µg/kg	150	2100	7100	6350	8.0	4400	2600	170	30 U	6.9 U	85 U	13 U	190 U	33	10 U	10 U
Benzo(a)pyrene	µg/kg	15	210	4400	4450	7.7	4500	2500	200 J	49 J	6.9 U	85 U	13 U	190 U	23	10 U	10 U
Benzo(b)fluoranthene	µg/kg	150	2100	6000	5800	11	4200	3300	280 J	88 J	6.9 U	85 U	13 U	190 U	34	10 U	10 U
Benzo(g,h,i)perylene	µg/kg	-	-	1800	1900	7.4 U	2300	1400	140	49	6.9 U	85 U	13 U	190 U	14	10 U	10 U
Benzo(k)fluoranthene	µg/kg	1500	21000	2800	2600	7.4 U	2400	1400	120	30 U	6.9 U	85 U	13 U	190 U	16	10 U	10 U
Biphenyl (1,1-Biphenyl)	µg/kg	3900000	51000000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
bis(2-Chloroethoxy)methane	µg/kg	180000	1800000	1400 U	2200 U	110 U	2600 U	840 U	290 U	450 U	100 U	1300 U	190 U	2800 U	120 U	150 U	160 U
bis(2-Chloroethyl)ether	µg/kg	210	1000	1400 U	2200 U	110 U	2600 U	840 U	290 U	450 U	100 U	1300 U	190 U	2800 U	120 U	150 U	160 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/kg	35000	120000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	720	74 J	3000	61 U	76 U	54 J
Butyl benzylphthalate (BBP)	µg/kg	260000	910000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	200	1400 U	61 U	76 U	78 U
Caprolactam	µg/kg	31000000	310000000	4600 U	7400 U	370 U	8500 U	2800 U	960 U	1500 U	340 U	4200 U	630 U	9300 U	400 U	500 U	510 U
Carbazole	µg/kg	-	-	1700	1500	56 U	1300 U	250 J	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Chrysene	µg/kg	15000	210000	6200	5900	7.4 U	5700	2800	210	180	6.9 U	85 U	13 U	190 U	38	10 U	10 U
Dibenz(a,h)anthracene	µg/kg	15	210	590	680	7.4 U	170 U	540	19 U	30 U	6.9 U	85 U	13 U	190 U	8.1 U	10 U	10 U
Dibenzofuran	µg/kg	78000	1000000	890	770 J	56 U	860 J	760	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Diethyl phthalate	µg/kg	49000000	490000000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Dimethyl phthalate	µg/kg	-	-	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Di-n-butylphthalate (DBP)	µg/kg	6100000	62000000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	45 J	2600	61 U	76 U	78 U
Di-n-octyl phthalate (DnOP)	µg/kg	-	-	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Fluoranthene	µg/kg	2300000	22000000	16000	15000	13	21000	12000	340 J	940 J	6.9 U	85 U	13 U	370	70	10 U	10 U
Fluorene	µg/kg	2300000	22000000	1500	1300	7.4 U	2000	1600	19 U	30 U	6.9 U	85 U	13 U	190 U	8.1 U	10 U	10 U
Hexachlorobenzene	µg/kg	300	1100	92 U	150 U	7.4 U	170 U	56 U	19 U	30 U	6.9 U	85 U	13 U	190 U	8.1 U	10 U	10 U
Hexachlorobutadiene	µg/kg	6200	22000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Hexachlorocyclopentadiene	µg/kg	370000	3700000	4600 U	7400 U	370 U	8500 U	2800 U	960 U	1500 U	340 U	4200 U	630 U	9300 U	400 U	500 U	510 U
Hexachloroethane	µg/kg	35000	120000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Indeno(1,2,3-cd)pyrene	µg/kg	150	2100	3000	2800	7.4 U	2800	1500	150	30 U	6.9 U	85 U	13 U	190 U	12	10 U	10 U
Isophorone	µg/kg	510000	1800000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Naphthalene	µg/kg	3600	18000	380	310	7.4 U	270	56 U	19 U	30 U	6.9 U	810	28	3900	18	10 U	10 U
Nitrobenzene	µg/kg	4800	24000	1400 U	2200 U	110 U	2600 U	840 U	290 U	450 U	100 U	1300 U	190 U	2800 U	120 U	150 U	160 U
N-Nitrosodi-n-propylamine	µg/kg	69	250	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
N-Nitrosodiphenylamine	µg/kg	99000	350000	690 U	1100 U	56 U	1300 U	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Pentachlorophenol	µg/kg	3000	9000	2100 U	3300 U	170 U	3900 U	1300 U	440 U	680 U	160 U	1900 U	290 U	4200 U	180 U	230 U	230 U
Phenanthrene	µg/kg	-	-	13000	12000	7.4 U	6800	3700	110 J	390 J	6.9 U	85 U	13 U	430	53	10 U	11
Phenol	µg/kg	18000000	180000000	690 U	1100 U	56 U	970 J	420 U	150 U	230 U	52 U	640 U	95 U	1400 U	61 U	76 U	78 U
Pyrene	µg/kg	1700000	17000000	13000	12000	12	13000	8300	300	830	6.9 U	85 U	13 U	330	58	10 U	10 U

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TT-5		TT-5	TT-7		TT-7	TT-8		TT-8		TT-9		TT-9	TT-10		TT-10
Sample ID:				S-38443-093008-KMV-051	S-38443-093008-KMV-051-D	S-38443-093008-KMV-052	S-38443-100708-KMV-061		S-38443-100708-KMV-063	S-38443-100608-KMV-050	S-38443-100608-KMV-050-D	S-38443-100608-KMV-051		S-38443-100308-KMV-047	S-38443-100308-KMV-048	S-38443-100308-KMV-049	S-38443-100308-KMV-044	S-38443-100308-KMV-045	S-38443-100308-KMV-046
Sample Date:				9/30/2008	9/30/2008	9/30/2008	10/7/2008		10/7/2008	10/6/2008	10/6/2008	10/6/2008		10/3/2008	10/3/2008	10/3/2008	10/3/2008	10/3/2008	10/3/2008
Sample Depth:				14 ft BGS	14 ft BGS	17 ft BGS	6 ft BGS		16 ft BGS	4 ft BGS	4 ft BGS	15 ft BGS		7 ft BGS	17 ft BGS	22 ft BGS	5 ft BGS	10 ft BGS	15 ft BGS
Parameter	Units	Residential Soil Criteria a	Industrial Soil Criteria b		Duplicate						Duplicate								
Metals																			
Aluminum	mg/kg	77000	990000	5340	5760	1200	6160		8370	7270	7130	2100		5740	7220	5530	2120	3550	3910
Antimony	mg/kg	31	410	13.5 J	26.7 J	1.3 J	22.6 J		5.6 J	1.8 J	2.0 J	6.2 UJ		6.6 J	1.6 J	3.4 J	1.5 J	2.0 J	2.1 J
Arsenic	mg/kg	0.39	1.6	31.7	25.1	7.5	19.8		38.8	8.6	10.6	2.9		38.0	18.5	18.8	21.6	47.8	31.2
Barium	mg/kg	15000	190000	254	276	17.9 J	971		675	1150	450	10.1 J		197	162	829	343	735	761
Beryllium	mg/kg	160	2000	4.0 J	2.8	0.094 J	0.52 J		0.38 J	0.98	1.2	0.52 U		2.6	2.5	1.6	0.88	1.4	1.5
Cadmium	mg/kg	70	800	0.86 J	3.3 J	0.11 J	10.1 J		5.3 J	2.0 J	2.6 J	0.18 J		6.3	0.36 J	2.2	0.090 J	0.76 U	0.78 U
Calcium	mg/kg	-	-	19100 J	32500 J	139000 J	59700		50900	55500	52600	109000		1670 J	21200 J	39900 J	4100 J	1620 J	7160 J
Chromium	mg/kg	-	-	18.1	20.8	3.2	63.1 J		49.2 J	60.0 J	47.4 J	5.2 J		40.4	25.1	35.8	7.9	15.0	16.7
Cobalt	mg/kg	23	300	12.4	9.5	2.0 J	11.9		14.0	4.7 J	7.0	2.3 J		11.8	12.7	8.9	2.7 J	4.9 J	5.9 J
Copper	mg/kg	3100	41000	114	270	15.2	7548 J		659 J	176 J	173 J	8.1 J		389	56.4	597	39.1	48.1	55.9
Iron	mg/kg	55000	720000	8570	11400	7600	72100		83000	13700	20400	5820		16800	29300	23700	4410	4670	5880
Lead	mg/kg	400	800	82.3 J	178 J	6.4 J	2380		769	234	238	4.6 J		1200	15.0 J	357	27.5	45.2	48.3
Magnesium	mg/kg	-	-	6240	10400 J	84800	20500		15700	26200	20700	51300		652 J	3370 J	13400 J	1700 J	325 J	3720 J
Manganese	mg/kg	1800	23000	155 J	224	183 J	557 J		598 J	190 J	211 J	198 J		163	88.1	217	18.6	13.5	19.7
Mercury	mg/kg	5.6	34	0.15	0.22	0.11 U	2.6		0.25	0.12	0.13	0.10 U		0.40	0.12 J	0.25	0.039 J	0.087 J	0.096 J
Nickel	mg/kg	1500	20000	30.2	40.2	6.8	87.9 J		71.6 J	31.9 J	21.4 J	6.8 J		40.2	33.3	27.6	8.2	11.8	13.6
Potassium	mg/kg	-	-	852 J	799	277 J	1090		1350	746	596	313 J		415 J	937 J	686 J	339 J	547 J	590 J
Selenium	mg/kg	390	5100	0.83 J	0.82 J	27.8 U	161 U		158 U	0.61 J	28.4 U	25.9 U		7.2 J	1.6 J	7.0 J	5.5 J	7.7 J	7.1 J
Silver	mg/kg	390	5100	0.37 J	0.42 J	1.1 U	2.5		4.5	1.2 U	1.1 U	1.0 U		0.94 J	1.9 U	0.46 J	1.2 U	1.5 U	1.6 U
Sodium	mg/kg	-	-	136 J	194 J	194 J	833		882	596	543 J	191 J		106 J	272 J	169 J	608 U	757 U	776 U
Thallium	mg/kg	-	-	1.4	0.56 U	0.11 U	0.20		0.17	0.18	0.12 U	0.10 U		0.64 U	0.98	0.57	0.45	0.76 U	1.1
Vanadium	mg/kg	390	5200	29.3 J	25.4	5.0 J	22.1 J		18.2 J	18.9	19.3	8.4		37.3	39.2	30.5	23.4	44.6	47.2
Zinc	mg/kg	23000	310000	165 J	440	22.8 J	1790		1460	2460	2050	23.2		89.6	40.6	264	15.9	12.1	15.1
PCBs																			
Aroclor-1016 (PCB-1016)	µg/kg	3900	21000	36 U	37 U	37 UJ	210 U		4200 U	77 U	75 U	34 U		420 U	63 U	230 U	40 U	50 U	51 U
Aroclor-1221 (PCB-1221)	µg/kg	140	540	36 U	37 U	37 UJ	210 U		4200 U	77 U	75 U	34 U		420 U	63 U	230 U	40 U	50 U	51 U
Aroclor-1232 (PCB-1232)	µg/kg	140	540	36 U	37 U	37 UJ	210 U		4200 U	77 U	75 U	34 U		420 U	63 U	230 U	40 U	50 U	51 U
Aroclor-1242 (PCB-1242)	µg/kg	220	740	36 U	37 U	37 UJ	1700		13000	77 U	75 U	34 U		420 U	63 U	490	40 U	50 U	51 U
Aroclor-1248 (PCB-1248)	µg/kg	220	740	36 U	37 U	37 UJ	210 U		4200 U	77 U	430	34 U		420 U	63 U	230 U	40 U	50 U	51 U
Aroclor-1254 (PCB-1254)	µg/kg	220	740	170	160	37 UJ	1600		4900	77 U	75 U	34 UJ		3700	200	1000	40 U	50 U	51 U
Aroclor-1260 (PCB-1260)	µg/kg	220	740	36 U	37 U	37 UJ	210 U		4200 U	500	380	34 UJ		420 U	63 U	230 U	40 U	50 U	51 U
Pesticides																			
4,4'-DDD	µg/kg	2000	7200	94 U	190 U	9.4 UJ	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
4,4'-DDE	µg/kg	1400	5100	94 U	190 U	9.4 U	93 J		28 J	200 U	9.7 J	8.8 U		220	65 U	77 J	27 J	4.3 J	1.4 J
4,4'-DDT	µg/kg	1700	7000	47 J	190 U	9.4 UJ	220 UJ		110 UJ	200 UJ	21 J	8.8 UJ		44 UJ	65 UJ	240 UJ	41 UJ	13 UJ	2.6 UJ
Aldrin	µg/kg	29	100	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
alpha-BHC	µg/kg	77	270	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
alpha-Chlordane	µg/kg	-	-	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
beta-BHC	µg/kg	270	960	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
delta-BHC	µg/kg	-	-	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
Dieldrin	µg/kg	30	110	94 U	190 U	9.4 U	220 U		38 J	200 U	12 J	8.8 U		270 J	65 U	240 U	41 U	13 U	2.6 U
Endosulfan I	µg/kg	-	-	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
Endosulfan II	µg/kg	-	-	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
Endosulfan sulfate	µg/kg	-	-	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
Endrin	µg/kg	18000	180000	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
Endrin aldehyde	µg/kg	-	-	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		28 J	65 U	240 U	41 U	13 U	2.6 U
Endrin ketone	µg/kg	-	-	94 U	190 U	9.4 U	220 U		110 U	200 U	19 J	8.8 U		28 J	65 U	96 J	41 U	13 U	1.1 J
gamma-BHC (lindane)	µg/kg	520	2100	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
gamma-Chlordane	µg/kg	-	-	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		180 J	27 J	240 U	41 U	13 U	2.6 U
Heptachlor	µg/kg	110	380	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		44 U	65 U	240 U	41 U	13 U	2.6 U
Heptachlor epoxide	µg/kg	53	190	94 U	190 U	9.4 U	220 U		110 U	200 U	39 U	8.8 U		27 J	65 U	240 U	41 U	13 U	2.6 U
Methoxychlor	µg/kg	310000	3100000	180 U	370 U	18 UJ	420 U		210 U	380 U	75 U	17 U		85 UJ	130 UJ	460 UJ	80 UJ	25 UJ	5.1 UJ
Toxaphene	µg/kg	440	1600	3700 U	7500 UJ	370 UJ	8600 U		4200 U	7800 U	1500 U	350 U		1700 U	2600 U	9400 U	1600 U	510 U	100 U
Herbicides																			
2,4,5-TP (Silvex)	µg/kg	490000	4900000	22 U	22 U	22 U	2600 U		500 U	23 U	23 U	21 U		26 U	38 U	28 U	24 U	30 U	31 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	µg/kg	690000	7700000	88 U	89 U	89 U	10000 U		2000 U	93 U	91 U	83 U		100 UJ	150 UJ	110 UJ	97 UJ	120 UJ	120 UJ
General Chemistry																			
Cyanide (total)	mg/kg	1600	20000	0.55 U	0.56 U	0.56 U	0.64 U		1.4	0.27 J	0.57 U	0.52 U		0.64 U	1.4 J	1.9 J	0.61 U	0.76 U	0.78 U
Total solids	%	-	-	90.5	89.7	90.0	77.7		79.3	85.9	87.9	96.4		78.1	52.4	71.1	82.2	66.1	64.4

Notes:

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

[illegible] applicable.

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TT-11	TT-11	TT-11	TT-12	TT-12	TT-12	TT-13	TT-14	TT-15	TT-15	TT-16	TT-17	TT-17	TT-18	TT-18
Sample ID:				S-38443-100208-KMV-041	S-38443-100208-KMV-042	S-38443-100208-KMV-043	S-38443-100208-KMV-038	S-38443-100208-KMV-039	S-38443-100208-KMV-040	S-38443-092508-KMV-017	S-38443-092508-KMV-015	S-38443-092508-KMV-016	S-38443-092508-KMV-016-D	S-38443-093008-KMV-033	S-38443-093008-KMV-034	S-38443-093008-KMV-035	S-38443-100108-KMV-036	S-38443-100108-KMV-037
Sample Date:				10/2/2008	10/2/2008	10/2/2008	10/2/2008	10/2/2008	10/2/2008	9/25/2008	9/25/2008	9/25/2008	9/25/2008	9/30/2008	9/30/2008	9/30/2008	10/1/2008	10/1/2008
Sample Depth:		*Residential Soil*	*Industrial Soil*	5 ft BGS	10 ft BGS	21 ft BGS	5 ft BGS	10 ft BGS	21 ft BGS	7 ft BGS	3 ft BGS	8.6 ft BGS	8.5 ft BGS	2 ft BGS	5 ft BGS	14 ft BGS	5 ft BGS	12 ft BGS
													Duplicate					
Parameter	*Units*	*Criteria*	*Criteria*															
		a	*b*															
Volatiles																		
1,1,1-Trichloroethane	µg/kg	8700000	38000000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,1,2,2-Tetrachloroethane	µg/kg	560	2800	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,1,2-Trichloroethane	µg/kg	1100	5300	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,1-Dichloroethane	µg/kg	3300	17000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,1-Dichloroethene	µg/kg	240000	1100000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,2,4-Trichlorobenzene	µg/kg	22000	99000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	5.4	69	8.9 U	11 U	9.4 U	8.9 U	8.5 U	8.0 U	9.4 U	11 U	10 U	9.5 U	9.4 U	10 U	12 U	R	9.8 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	34	170	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,2-Dichlorobenzene	µg/kg	1900000	9800000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,2-Dichloroethane	µg/kg	430	2200	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,2-Dichloropropane	µg/kg	890	4500	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,3-Dichlorobenzene	µg/kg	-	-	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
1,4-Dichlorobenzene	µg/kg	2400	12000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	23 J	4.9 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	28000000	200000000	18 U	21 U	19 U	18 U	17 U	16 U	19 U	4.6 J	20 U	19 U	4.7 J	20 U	24 U	R	20 U
2-Hexanone	µg/kg	210000	1400000	18 U	21 U	19 U	18 U	17 U	16 U	19 U	21 U	20 U	19 U	19 U	20 U	24 U	R	20 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (M	µg/kg	5300000	53000000	18 U	21 U	19 U	18 U	17 U	16 U	19 U	21 U	20 U	19 U	19 U	20 U	24 U	R	20 U
Acetone	µg/kg	61000000	630000000	18 U	R	R	R	17 U	16 U	19 U	21 U	20 U	19 U	13 J	20 U	24 U	R	20 U
Benzene	µg/kg	1100	5400	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Bromodichloromethane	µg/kg	270	1400	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Bromoform	µg/kg	61000	220000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Bromomethane (Methyl bromide)	µg/kg	7300	32000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Carbon disulfide	µg/kg	820000	3700000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Carbon tetrachloride	µg/kg	250	1200	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Chlorobenzene	µg/kg	290000	1400000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	0.57 J	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Chloroethane	µg/kg	15000000	61000000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Chloroform (Trichloromethane)	µg/kg	290	1500	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Chloromethane (Methyl chloride)	µg/kg	120000	500000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
cis-1,2-Dichloroethene	µg/kg	780000	10000000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	0.30 J	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
cis-1,3-Dichloropropene	µg/kg	-	-	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Cyclohexane	µg/kg	7000000	29000000	8.9 U	11 U	9.4 U	8.9 U	8.5 U	8.0 U	9.4 U	11 U	10 U	9.5 U	9.4 U	10 U	12 U	210 J	9.8 U
Dibromochloromethane	µg/kg	680	3300	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Dichlorodifluoromethane (CFC-12)	µg/kg	180000	780000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Ethylbenzene	µg/kg	5400	27000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Isopropyl benzene	µg/kg	2100000	11000000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Methyl acetate	µg/kg	78000000	1000000000	8.9 U	11 U	9.4 U	8.9 U	8.5 U	8.0 U	9.4 U	11 U	10 U	9.5 U	9.4 U	10 U	12 U	R	9.8 U
Methyl cyclohexane	µg/kg	-	-	8.9 U	11 U	9.4 U	8.9 U	8.5 U	8.0 U	9.4 U	11 U	10 U	9.5 U	9.4 U	10 U	12 U	410 J	0.74 J
Methyl tert butyl ether (MTBE)	µg/kg	43000	220000	18 U	21 U	19 U	18 U	17 U	16 U	19 U	21 U	20 U	19 U	19 U	20 U	24 U	R	20 U
Methylene chloride	µg/kg	11000	53000	4.4 U	5.3 U	0.65 J	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	500 J	4.9 U
Styrene	µg/kg	6300000	36000000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Tetrachloroethene	µg/kg	550	2600	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Toluene	µg/kg	5000000	45000000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	0.75 J	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
trans-1,2-Dichloroethene	µg/kg	150000	690000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
trans-1,3-Dichloropropene	µg/kg	-	-	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Trichloroethene	µg/kg	2800	14000	4.4 U	5.3 U	10	4.4 U	4.2 U	1.3 J	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Trichlorofluoromethane (CFC-11)	µg/kg	790000	3400000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Trifluorotrichloroethane (Freon 113)	µg/kg	43000000	180000000	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Vinyl chloride	µg/kg	60	1700	4.4 U	5.3 U	4.7 U	4.4 U	4.2 U	4.0 U	4.7 U	5.3 U	5.0 U	4.8 U	4.7 U	5.0 U	6.1 U	R	4.9 U
Xylene (total)	µg/kg	630000	2700000	1.1 J	11 U	9.4 U	8.9 U	1.0 J	8.0 U	9.4 U	11 U	10 U	9.5 U	9.4 U	10 U	12 U	R	2.1 J

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TT-11	TT-11	TT-11	TT-12	TT-12	TT-12	TT-13	TT-14	TT-15	TT-15	TT-16	TT-17	TT-17	TT-18	TT-18
Sample ID:				S-38463-100208-KMV-041	S-38463-100208-KMV-042	S-38463-100208-KMV-043	S-38463-100208-KMV-038	S-38463-100208-KMV-039	S-38463-100208-KMV-040	S-38463-092508-KMV-017	S-38463-092508-KMV-015	S-38463-092508-KMV-016	S-38463-092508-KMV-016-D	S-38463-093008-KMV-053	S-38463-093008-KMV-054	S-38463-093008-KMV-055	S-38463-100108-KMV-056	S-38463-100108-KMV-057
Sample Date:				10/2/2008	10/2/2008	10/2/2008	10/2/2008	10/2/2008	10/2/2008	9/25/2008	9/25/2008	9/25/2008	9/25/2008	9/30/2008	9/30/2008	9/30/2008	10/1/2008	10/1/2008
Sample Depth:				5 ft BGS	10 ft BGS	21 ft BGS	5 ft BGS	10 ft BGS	21 ft BGS	7 ft BGS	3 ft BGS	8.6 ft BGS	8.6 ft BGS Duplicate	2 ft BGS	5 ft BGS	14 ft BGS	5 ft BGS	12 ft BGS
Parameter	*Units*	*Residential Soil Criteria a*	*Industrial Soil Criteria b*															
Semi-Volatiles																		
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopro	µg/kg	4600	22000	110 U	220 U	110 U	110 U	110 U	110 U	100 U	470 U	1100 U	1200 U	240 U	110 U	500 U	140 U	110 U
2,4,5-Trichlorophenol	µg/kg	6100000	62000000	160 U	330 U	160 U	170 U	160 U	170 U	160 U	700 U	1700 U	1700 U	360 U	160 U	750 U	200 U	160 U
2,4,6-Trichlorophenol	µg/kg	44000	160000	160 U	330 U	160 U	170 U	160 U	170 U	160 U	700 U	1700 U	1700 U	360 U	160 U	750 U	200 U	160 U
2,4-Dichlorophenol	µg/kg	180000	1800000	160 U	330 U	160 U	170 U	160 U	170 U	160 U	700 U	1700 U	1700 U	360 U	160 U	750 U	200 U	160 U
2,4-Dimethylphenol	µg/kg	1200000	12000000	160 U	330 U	160 U	170 U	160 U	170 U	160 U	700 U	1700 U	1700 U	360 U	160 U	750 U	200 U	160 U
2,4-Dinitrophenol	µg/kg	120000	1200000	360 U	720 U	360 U	370 U	360 U	370 U	350 U	1500 U	3800 U	3800 U	790 U	360 U	1600 U	450 U	350 U
2,4-Dinitrotoluene	µg/kg	1600	5500	220 U	430 U	220 U	220 U	220 U	220 U	210 U	940 U	2300 U	2300 U	480 U	220 U	1000 U	270 U	210 U
2,6-Dinitrotoluene	µg/kg	61000	620000	220 U	430 U	220 U	220 U	220 U	220 U	210 U	940 U	2300 U	2300 U	480 U	220 U	1000 U	270 U	210 U
2-Chloronaphthalene	µg/kg	6300000	82000000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
2-Chlorophenol	µg/kg	390000	5100000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
2-Methylnaphthalene	µg/kg	310000	4100000	7.2 U	18	7.2 U	7.4 U	7.2 U	7.4 U	7.0 U	31 U	77 U	77 U	16 U	7.3 U	42	10	62
2-Methylphenol	µg/kg	3100000	31000000	220 U	430 U	220 U	220 U	220 U	220 U	210 U	940 U	2300 U	2300 U	480 U	220 U	1000 U	270 U	210 U
2-Nitroaniline	µg/kg	610000	6000000	220 U	430 U	220 U	220 U	220 U	220 U	210 U	940 U	2300 U	2300 U	480 U	220 U	1000 U	270 U	210 U
2-Nitrophenol	µg/kg	-	-	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
3,3'-Dichlorobenzidine	µg/kg	1100	3800	110 U	220 U	110 U	110 U	110 U	110 U	100 U	470 U	1100 U	1200 U	240 U	110 U	500 U	140 U	110 U
3-Nitroaniline	µg/kg	-	-	220 U	430 U	220 U	220 U	220 U	220 U	210 U	940 U	2300 U	2300 U	480 U	220 U	1000 U	270 U	210 U
4,6-Dinitro-2-methylphenol	µg/kg	6100	62000	160 U	330 U	160 U	170 U	160 U	170 U	160 U	700 U	1700 U	1700 U	360 U	160 U	750 U	200 U	160 U
4-Bromophenyl phenyl ether	µg/kg	-	-	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
4-Chloro-3-methylphenol	µg/kg	6100000	62000000	160 U	330 U	160 U	170 U	160 U	170 U	160 U	700 U	1700 U	1700 U	360 U	160 U	750 U	200 U	160 U
4-Chloroaniline	µg/kg	2400	8600	160 U	330 U	160 U	170 U	160 U	170 U	160 U	700 U	1700 U	1700 U	360 U	160 U	750 U	200 U	160 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
4-Methylphenol	µg/kg	310000	3100000	220 U	430 U	220 U	220 U	220 U	220 U	210 U	940 U	2300 U	2300 U	480 U	220 U	1000 U	270 U	210 U
4-Nitroaniline	µg/kg	24000	86000	220 U	430 U	220 U	220 U	220 U	220 U	210 U	940 U	2300 U	2300 U	480 U	220 U	1000 U	270 U	210 U
4-Nitrophenol	µg/kg	-	-	360 U	720 U	360 U	370 U	360 U	370 U	350 U	1500 U	3800 U	3800 U	790 U	360 U	1600 U	450 U	350 U
Acenaphthene	µg/kg	3400000	33000000	7.4	56	7.2 U	7.4 U	7.2 U	7.4 U	7.1	200	77 U	77 U	45	8.5	250	9.1 U	140
Acenaphthylene	µg/kg	-	-	25	45	7.2 U	7.4 U	7.2 U	7.4 U	7.0 U	41	77 U	77 U	87	7.3 U	33 U	9.1 U	8.0
Acetophenone	µg/kg	7800000	100000000	110 U	220 U	110 U	110 U	110 U	110 U	100 U	470 U	1100 U	1200 U	240 U	110 U	500 U	140 U	110 U
Anthracene	µg/kg	17000000	170000000	40	180	7.2 U	7.4 U	7.2 U	7.4 U	21	570	77 U	77 U	190	18	370	9.1 U	50
Atrazine	µg/kg	2100	7500	220 U	430 U	220 U	220 U	220 U	220 U	210 U	940 U	2300 U	2300 U	480 U	220 U	1000 U	270 U	210 U
Benzaldehyde	µg/kg	7800000	100000000	110 U	220 U	110 U	110 U	110 U	110 U	100 U	470 U	1100 U	1200 U	240 U	110 U	500 U	140 U	110 U
[illegible]o(a)anthracene	µg/kg	150	2100	240*	760*	7.2 U	14	35	15	110	2800*	77 U	77 U	700*	84	1300*	9.1 U	78
[illegible]o(a)pyrene	µg/kg	15	210	220**	660**	7.2 U	13	34*	14	97*	1900**	77 U	77 U	870**	89*	950**	9.1 U	73*
[illegible]o(b)fluoranthene	µg/kg	150	2100	350*	850*	7.2 U	15	39	18	140	3000*	77 U	77 U	1100*	120	1300*	9.1 U	100
Benzo(g,h,i)perylene	µg/kg	-	-	200	420	7.2 U	14	21	11	71	900	77 U	77 U	630	67	560	9.1 U	50
Benzo(k)fluoranthene	µg/kg	1500	21000	170	360	7.2 U	7.6	18	7.7	52	960	77 U	77 U	400	59	600	9.1 U	42
Biphenyl (1,1-Biphenyl)	µg/kg	3900000	51000000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
bis(2-Chloroethoxy)methane	µg/kg	180000	1800000	110 U	220 U	110 U	110 U	110 U	110 U	100 U	470 U	1100 U	1200 U	240 U	110 U	500 U	140 U	110 U
bis(2-Chloroethyl)ether	µg/kg	210	1000	110 U	220 U	110 U	110 U	110 U	110 U	100 U	470 U	1100 U	1200 U	240 U	110 U	500 U	140 U	110 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/kg	35000	120000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	99 J	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Butyl benzylphthalate (BBP)	µg/kg	260000	910000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Caprolactam	µg/kg	31000000	310000000	360 U	720 U	360 U	370 U	360 U	370 U	350 U	1500 U	3800 U	3800 U	790 U	360 U	1600 U	450 U	350 U
Carbazole	µg/kg	-	-	54 U	78 J	54 U	55 U	54 U	55 U	52 U	130 J	570 U	580 U	90 J	55 U	400	68 U	53 U
Chrysene	µg/kg	15000	210000	250	770	7.2 U	13	32	15	110	2000	77 U	77 U	820	110	1400	9.1 U	80
Dibenz(a,h)anthracene	µg/kg	15	210	36*	110*	7.2 U	7.4 U	7.2 U	7.4 U	7.0 U	31 U	77 U	77 U	190*	14	140*	9.1 U	11
Dibenzofuran	µg/kg	78000	1000000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	100 J	570 U	580 U	120 U	55 U	180 J	68 U	84
Diethyl phthalate	µg/kg	49000000	490000000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Dimethyl phthalate	µg/kg	-	-	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Di-n-butylphthalate (DBP)	µg/kg	6100000	62000000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Di-n-octyl phthalate (DnOP)	µg/kg	-	-	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Fluoranthene	µg/kg	2300000	22000000	400	1500	7.2 U	24	43	25	210	4600	120	110	1700	230	3700	9.1 U	190
Fluorene	µg/kg	2300000	22000000	9.8	59	7.2 U	7.4 U	7.2 U	7.4 U	7.0 U	250	77 U	77 U	64	8.5	250	9.1 U	100
Hexachlorobenzene	µg/kg	300	1100	7.2 U	14 U	7.2 U	7.4 U	7.2 U	7.4 U	7.0 U	31 U	77 U	77 U	16 U	7.3 U	33 U	9.1 U	7.1 U
Hexachlorobutadiene	µg/kg	6200	22000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Hexachlorocyclopentadiene	µg/kg	370000	3700000	360 U	720 U	360 U	370 U	360 U	370 U	350 U	1500 U	3800 U	3800 U	790 U	360 U	1600 U	450 U	350 U
Hexachloroethane	µg/kg	35000	120000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Indeno(1,2,3-cd)pyrene	µg/kg	150	2100	190*	390*	7.2 U	8.8	20	8.8	59	810*	77 U	77 U	340*	55	330*	9.1 U	45
Isophorone	µg/kg	510000	1800000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Naphthalene	µg/kg	3600	18000	7.2 U	25	7.2 U	7.4 U	7.2 U	7.4 U	7.0 U	31 U	77 U	77 U	16 U	7.3 U	110	9.1 U	46
Nitrobenzene	µg/kg	4800	26000	110 U	220 U	110 U	110 U	110 U	110 U	100 U	470 U	1100 U	1200 U	240 U	110 U	500 U	140 U	110 U
N-Nitrosodi-n-propylamine	µg/kg	69	250	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
N-Nitrosodiphenylamine	µg/kg	99000	350000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Pentachlorophenol	µg/kg	3000	9000	160 U	330 U	160 U	170 U	160 U	170 U	160 U	700 U	1700 U	1700 U	360 U	160 U	750 U	200 U	160 U
Phenanthrene	µg/kg	-	-	130	850	7.2 U	11	15	13	95	1600	77 U	77 U	850	140	3400	9.1 U	250
Phenol	µg/kg	18000000	180000000	54 U	110 U	54 U	55 U	54 U	55 U	52 U	230 U	570 U	580 U	120 U	55 U	250 U	68 U	53 U
Pyrene	µg/kg	1700000	17000000	340	1300	7.2 U	21	40	24	200	3800	89	78	1400	180	2900	9.1 U	169

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TT-11	TT-11	TT-11	TT-12	TT-12	TT-12	TT-13	TT-14	TT-15	TT-15	TT-16	TT-17	TT-17	TT-18	TT-18
Sample ID:				S-38443-100208-KMV-041	S-38443-100208-KMV-042	S-38443-100208-KMV-043	S-38443-100208-KMV-038	S-38443-100208-KMV-039	S-38443-100208-KMV-040	S-38443-092508-KMV-017	S-38443-092508-KMV-015	S-38443-092508-KMV-016	S-38443-092508-KMV-016-D	S-38443-093008-KMV-033	S-38443-093008-KMV-034	S-38443-093008-KMV-035	S-38443-100108-KMV-036	S-38443-100108-KMV-037
Sample Date:				10/2/2008	10/2/2008	10/2/2008	10/2/2008	10/2/2008	10/2/2008	9/25/2008	9/25/2008	9/25/2008	9/25/2008	9/30/2008	9/30/2008	9/30/2008	10/1/2008	10/1/2008
Sample Depth:				5 ft BGS	10 ft BGS	21 ft BGS	5 ft BGS	10 ft BGS	21 ft BGS	7 ft BGS	3 ft BGS	8.6 ft BGS	8.6 ft BGS Duplicate	2 ft BGS	5 ft BGS	14 ft BGS	5 ft BGS	12 ft BGS
Parameter	Units	Residential Soil Criteria a	Industrial Soil Criteria b															
Metals																		
Aluminum	mg/kg	77000	990000	5640	6450	1420	5330	1980	1240	3720	5370	3670	3990	5270	6830	3180	5680	2310
Antimony	mg/kg	31	410	6.5 UJ	1.7 J	6.5 UJ	6.7 UJ	6.5 UJ	6.6 UJ	0.50 J	7.0 UJ	34.4 UJ	34.5 UJ	7.2 UJ	6.6 UJ	0.65 J	0.78 J	6.4 U
Arsenic	mg/kg	0.39	1.6	3.8[ab]	10.6[ab]	3.2[ab]	6.0[ab]	3.9[ab]	2.9[ab]	4.2 J[ab]	6.3 J[ab]	11.0 J[ab]	7.2 J[ab]	5.5[ab]	6.8[ab]	10.9[ab]	17.7[ab]	2.9[ab]
Barium	mg/kg	15000	190000	35.6	88.3	12.7 J	68.5	37.6	15.1 J	35.8	71.7	31.8	27.7	53.8	78.0	73.0	389	17.8 J
Beryllium	mg/kg	160	2000	0.21 J	0.34 J	0.54 U	0.22 J	0.12 J	0.051 J	0.52 U	0.22 J	0.088 J	0.089 J	0.24 J	0.33 J	0.36 J	0.97	0.099 J
Cadmium	mg/kg	70	800	0.54 U	0.74	0.54 U	0.18 J	0.099 J	0.057 J	0.21 J	0.39 J	4.5	3.4	0.29 J	0.18 J	0.11 J	0.68 U	0.10 J
Calcium	mg/kg	-	-	54000 J	28900 J	162000 J	54800 J	88900 J	74800 J	108000	108000	15100	20200	91200 J	50600 J	27500 J	5650	142000
Chromium	mg/kg	-	-	7.9	18.8	3.2	8.2	3.8	2.4	6.4 J	11.9 J	132 J	75.6 J	7.8	10.4	8.1	11.7	4.6
Cobalt	mg/kg	23	300	3.7 J	7.4	1.7 J	4.0 J	2.3 J	1.5 J	3.5 J	4.2 J	9.6 J	7.0 J	4.8 J	6.3	2.6 J	4.5 J	2.8 J
Copper	mg/kg	3100	41000	12.1	325	6.0	13.8	9.4	7.6	12.0	27.6	163	108	12.6	12.3	21.3	17.2	8.6
Iron	mg/kg	55000	720000	10100	63700[a]	4640	11700	6020	4060	7740	11700	134000[a]	77000[a]	11200	14200	12000	9890	6040
Lead	mg/kg	400	800	15.8 J	132 J	2.5 J	27.2 J	16.5 J	6.3 J	12.5	40.8	70.4	64.2	18.4 J	14.9 J	7.5 J	6.4 J	9.1 J
Magnesium	mg/kg	-	-	28100	11000	52800	27500	31900	30300	40800	34900	7050	11000	44300	13800	13400	1290	53600
Manganese	mg/kg	1800	23000	225 J	734 J	208 J	271 J	164 J	101 J	256	295	2500[a]	1690	624 J	441 J	76.0 J	84.9	297
Mercury	mg/kg	5.6	34	0.047 J	0.36	0.11 U	0.12	0.087 J	0.063 J	0.10 U	0.094 J	0.023 J	0.023 J	0.035 J	0.040 J	0.054 J	0.14 U	0.11 U
Nickel	mg/kg	1500	20000	10.4	17.8	4.2 J	11.6	6.0	4.0 J	8.1	12.9	105	57.8	10.7	11.0	7.5	8.8	7.4
Potassium	mg/kg	-	-	542 J	783 J	346 J	939 J	437 J	250 J	569	832	388 J	375 J	960 J	725 J	399 J	1070	365 J
Selenium	mg/kg	390	5100	27.0 U	27.1 U	27.0 U	27.7 U	27.1 U	27.7 U	26.1 U	29.3 U	143 U	144 U	30.0 U	27.5 U	1.1 J	3.7 J	26.6 U
Silver	mg/kg	390	5100	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.0 U	1.2 U	1.1 U	1.2 U	1.2 U	1.1 U	1.2 U	1.4 U	1.1 U
Sodium	mg/kg	-	-	101 J	543 U	145 J	883	683	291 J	523 U	586 U	574 U	575 U	162 J	530 U	625 U	130 J	177 J
Thallium	mg/kg	-	-	0.15 U	0.17 U	0.11 U	0.17 U	0.11 U	0.11 U	0.10 U	0.17	0.11 U	0.12 U	0.14 U	0.15 U	0.46	0.54	0.11 U
Vanadium	mg/kg	390	5200	14.3 J	36.2 J	5.5 J	14.0 J	6.4 J	4.6 J	12.3	15.1	11.8 J	13.1 J	14.5 J	18.1 J	13.8 J	28.2	6.2
Zinc	mg/kg	23000	310000	36.2 J	298 J	17.2 J	54.6 J	26.4 J	16.4 J	39.2 J	98.7 J	430 J	353 J	42.4 J	40.0 J	27.3 J	10.3	23.2
PCBs																		
Aroclor-1016 (PCB-1016)	µg/kg	3900	21000	36 U	36 U	36 U	37 U	36 U	37 U	35 U	39 U	38 U	38 U	40 UJ	36 UJ	41 U	45 UJ	35 UJ
Aroclor-1221 (PCB-1221)	µg/kg	140	540	36 U	36 U	36 U	37 U	36 U	37 U	35 U	39 U	38 U	38 U	40 UJ	36 UJ	41 U	45 UJ	35 UJ
Aroclor-1232 (PCB-1232)	µg/kg	140	540	36 U	36 U	36 U	37 U	36 U	37 U	35 U	39 U	38 U	38 U	40 UJ	36 UJ	41 U	45 UJ	35 UJ
Aroclor-1242 (PCB-1242)	µg/kg	220	740	36 U	36 U	36 U	37 U	36 U	37 U	35 U	39 U	38 U	38 U	40 UJ	36 UJ	41 U	45 UJ	35 UJ
Aroclor-1248 (PCB-1248)	µg/kg	220	740	36 U	36 U	36 U	37 U	36 U	37 U	35 U	39 U	38 U	38 U	40 UJ	36 UJ	59	45 UJ	35 UJ
Aroclor-1254 (PCB-1254)	µg/kg	220	740	36 U	20 J	36 U	37 U	36 U	37 U	35 U	130	38 U	38 U	40 UJ	36 UJ	41 U	45 UJ	35 UJ
Aroclor-1260 (PCB-1260)	µg/kg	220	740	36 U	36 U	36 U	37 U	36 U	37 U	35 U	39 U	35 J	38 U	40 UJ	36 UJ	41 U	45 UJ	35 UJ
Pesticides																		
4,4'-DDD	µg/kg	2000	7200	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 UJ	190 UJ	42 UJ	23 UJ	36 UJ
4,4'-DDE	µg/kg	1400	5100	24 J	43 J	9.2 U	19 U	18 U	9.4 U	18 U	12 J	39 U	39 U	100 U	190 U	42 U	23 U	36 U
4,4'-DDT	µg/kg	1700	7000	92 UJ	92 UJ	9.2 UJ	19 UJ	18 UJ	9.4 UJ	18 U	40 UJ	39 U	39 U	100 UJ	190 UJ	42 UJ	23 UJ	36 UJ
Aldrin	µg/kg	29	100	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
alpha-BHC	µg/kg	77	270	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
alpha-Chlordane	µg/kg	-	-	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
beta-BHC	µg/kg	270	960	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
delta-BHC	µg/kg	-	-	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Dieldrin	µg/kg	30	110	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Endosulfan I	µg/kg	-	-	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Endosulfan II	µg/kg	-	-	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Endosulfan sulfate	µg/kg	-	-	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Endrin	µg/kg	18000	180000	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Endrin aldehyde	µg/kg	-	-	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Endrin ketone	µg/kg	-	-	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
gamma-BHC (lindane)	µg/kg	520	2100	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
gamma-Chlordane	µg/kg	-	-	29 J	92 U	9.2 U	19 U	18 U	9.4 U	18 U	23 J	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Heptachlor	µg/kg	110	380	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Heptachlor epoxide	µg/kg	53	190	92 U	92 U	9.2 U	19 U	18 U	9.4 U	18 U	40 U	39 U	39 U	100 U	190 U	42 U	23 U	36 U
Methoxychlor	µg/kg	310000	3100000	180 UJ	180 UJ	18 UJ	37 UJ	36 UJ	18 UJ	35 U	77 UJ	76 U	76 U	200 UJ	360 UJ	82 UJ	45 UJ	70 UJ
Toxaphene	µg/kg	440	1600	3600 U	3600 U	360 U	740 U	730 U	370 U	700 U	1600 UJ	1500 U	1500 U	4000 UJ	7400 UJ	1700 UJ	910 UJ	1400 UJ
Herbicides																		
2,4,5-TP (Silvex)	µg/kg	490000	4900000	22 U	22 U	22 U	22 U	22 U	22 U	21 U	23 U	23 U	23 U	24 U	22 U	25 U	27 U	21 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	µg/kg	690000	7700000	87 UJ	87 UJ	87 UJ	89 UJ	87 UJ	89 UJ	84 UJ	94 UJ	92 UJ	92 UJ	96 U	88 U	100 U	110 U	85 U
General Chemistry																		
Cyanide (total)	mg/kg	1600	20000	0.54 U	0.54 U	0.54 U	0.55 U	0.51 J	0.55 U	0.52 U	0.13 J	0.57 U	0.58 U	0.60 U	0.55 U	0.25 J	0.68 U	0.52 J
Total solids	%	-	-	92.5	92.2	92.5	90.2	92.2	90.3	95.6	85.4	87.2	86.9	83.3	91.0	80.1	73.2	94.1

Notes:
J - The parameter was positively identified; however, the associated parameter concentration is estimated.
R - The parameter was rejected.
U - The parameter was not detected. The associated numerical value is the sample quantitation limit.
UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.
- - Not applicable.

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TT-19	TT-19	TT-20	TT-20	TT-20	TT-21	TT-21	TT-21	TT-21	TT-22	TT-22	TT-23	TT-23
Sample ID:				S-38443-100708-KMV-059	S-38443-100708-KMV-060	S-38443-100708-KMV-065	S-38443-100708-KMV-065-D	S-38443-100708-KMV-064	S-38443-100808-KMV-070	S-38443-100808-KMV-068	S-38443-100808-KMV-069	S-38443-100808-KMV-066	S-38443-100808-KMV-067	S-38443-100808-KMV-052	S-38443-100808-KMV-053
Sample Date:				10/7/2008	10/7/2008	10/7/2008	10/7/2008	10/7/2008	10/8/2008	10/8/2008	10/8/2008	10/8/2008	10/8/2008	10/8/2008	10/8/2008
Sample Depth:				7 ft BGS	9 ft BGS	7 ft BGS	7 ft BGS	15 ft BGS	7 ft BGS	8 ft BGS	21 ft BGS	6 ft BGS	21 ft BGS	7 ft BGS	18 ft BGS
Parameter	*Units*	*Residential Soil Criteria a*	*Industrial Soil Criteria b*													
Volatiles																
1,1,1-Trichloroethane	µg/kg	8700000	38000000	2.7 J	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
1,1,2,2-Tetrachloroethane	µg/kg	560	2800	6.4 UJ	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 UJ	4.7 U
1,1,2-Trichloroethane	µg/kg	1100	5300	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
1,1-Dichloroethane	µg/kg	3300	17000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	66 J	8.4 U	4.7 U
1,1-Dichloroethene	µg/kg	240000	1100000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
1,2,4-Trichlorobenzene	µg/kg	22000	99000	6.4 UJ	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 UJ	4.7 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	5.4	69	13 UJ	10 U	-	580 UJ	11 U	23000 U	650 U	2000 U	3600 U	720 U	17 UJ	9.4 U
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	34	170	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
1,2-Dichlorobenzene	µg/kg	1900000	9800000	6.4 UJ	5.2 U	-	290 UJ	5.4 U	11000 U	47 J	980 U	1800 U	360 U	8.4 UJ	4.7 U
1,2-Dichloroethane	µg/kg	430	2200	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
1,2-Dichloropropane	µg/kg	890	4500	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
1,3-Dichlorobenzene	µg/kg	-	-	6.4 UJ	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 UJ	4.7 U
1,4-Dichlorobenzene	µg/kg	2400	12000	6.4 UJ	5.2 U	-	290 UJ	5.4 U	11000 U	17 J	55 J	1800 U	360 U	8.4 UJ	4.7 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	28000000	200000000	26 U	21 U	-	1200 UJ	22 U	46000 U	1300 U	3900 U	7100 U	1400 U	33 U	19 U
2-Hexanone	µg/kg	210000	1400000	26 U	21 U	-	1200 UJ	22 U	46000 U	1300 U	3900 U	7100 U	1400 U	33 U	19 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (M	µg/kg	5300000	53000000	26 U	21 U	-	1200 UJ	22 U	46000 U	1300 U	3900 U	7100 U	530 J	33 U	19 U
Acetone	µg/kg	61000000	630000000	26 U	21 U	-	1200 UJ	22 U	9600 J	1300 UJ	3900 UJ	7100 UJ	1400 UJ	33 U	19 U
Benzene	µg/kg	1100	5400	1.0 J	5.2 U	-	290 UJ	5.4 U	12000*	210 J	360 J	530 J	290 J	8.4 U	4.7 U
Bromodichloromethane	µg/kg	270	1400	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Bromoform	µg/kg	61000	220000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Bromomethane (Methyl bromide)	µg/kg	7300	32000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Carbon disulfide	µg/kg	820000	3700000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Carbon tetrachloride	µg/kg	250	1200	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Chlorobenzene	µg/kg	290000	1400000	6.4 U	5.2 U	-	290 UJ	5.4 U	3100 J	14 J	42 J	1800 U	360 U	8.4 U	4.7 U
Chloroethane	µg/kg	15000000	61000000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Chloroform (Trichloromethane)	µg/kg	290	1500	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Chloromethane (Methyl chloride)	µg/kg	120000	500000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
cis-1,2-Dichloroethene	µg/kg	780000	10000000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	690	1400	150 J	360 U	16	4.7 U
cis-1,3-Dichloropropene	µg/kg	-	-	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Cyclohexane	µg/kg	7000000	29000000	13 U	10 U	-	580 UJ	11 U	9800 J	650 U	2000 U	3600 U	750	17 U	9.4 U
Dibromochloromethane	µg/kg	680	3300	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Dichlorodifluoromethane (CFC-12)	µg/kg	180000	780000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Ethylbenzene	µg/kg	5400	27000	6.4 U	5.2 U	-	290 UJ	5.4 U	170000*	2500	18000*	34000*	1500	8.4 U	4.7 U
Isopropyl benzene	µg/kg	2100000	11000000	6.4 U	5.2 U	-	290 UJ	5.4 U	8200 J	290 J	3300	2200	180 J	8.4 U	4.7 U
Methyl acetate	µg/kg	78000000	1000000000	13 U	10 U	-	580 UJ	11 U	23000 U	78 J	2000 U	3600 U	160 J	17 U	9.4 U
Methyl cyclohexane	µg/kg	-	-	13 U	0.85 J	-	580 UJ	11 U	64000	210 J	1400 J	4200	1700	17 U	9.4 U
Methyl tert butyl ether (MTBE)	µg/kg	43000	220000	26 U	21 U	-	1200 UJ	22 U	46000 U	1300 U	3900 U	7100 U	1400 U	33 U	19 U
Methylene chloride	µg/kg	11000	53000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Styrene	µg/kg	6300000	36000000	6.4 UJ	5.2 UJ	-	290 UJ	5.4 UJ	11000 UJ	320 UJ	980 UJ	1800 UJ	360 UJ	8.4 U	4.7 U
Tetrachloroethene	µg/kg	550	2600	1.6 J	5.2 U	-	2800 J*	57	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Toluene	µg/kg	5000000	45000000	1.6 J	0.41 J	-	24 J	5.4 U	50000	140 J	770 J	2900	540	8.4 U	4.7 U
trans-1,2-Dichloroethene	µg/kg	150000	690000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	56 J	130 J	1800 U	360 U	8.4 U	4.7 U
trans-1,3-Dichloropropene	µg/kg	-	-	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Trichloroethene	µg/kg	2800	14000	29	5.2 U	-	60 J	5.4 U	11000 U	400	790 J	1800 U	360 U	31	0.62 J
Trichlorofluoromethane (CFC-11)	µg/kg	790000	3400000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Trifluorotrichloroethane (Freon 113)	µg/kg	43000000	180000000	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	320 U	980 U	1800 U	360 U	8.4 U	4.7 U
Vinyl chloride	µg/kg	60	1700	6.4 U	5.2 U	-	290 UJ	5.4 U	11000 U	130 J*	490 J*	1800 U	61 J*	8.4 U	4.7 U
Xylene (total)	µg/kg	630000	2700000	2.0 J	1.4 J	-	380 UJ	1.4 J	480000	3600	61000	6300	1700	17 U	1.2 J

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				TT-19	TT-19	TT-20	TT-20	TT-20	TT-21	TT-21	TT-21	TT-22	TT-22	TT-22	TT-23	TT-23
Sample ID:				S-30443-100708-KMV-059	S-30443-100708-KMV-060	S-30443-100708-KMV-065	S-30443-100708-KMV-065-D	S-30443-100708-KMV-064	S-30443-100808-KMV-070	S-30443-100808-KMV-068	S-30443-100808-KMV-069	S-30443-100808-KMV-066	S-30443-100808-KMV-067	S-30443-100808-KMV-052	S-30443-100608-KMV-053
Sample Date:				10/7/2008	10/7/2008	10/7/2008	10/7/2008	10/7/2008	10/8/2008	10/8/2008	10/8/2008	10/8/2008	10/8/2008	10/6/2008	10/6/2008
Sample Depth:				7 ft BGS	9 ft BGS	7 ft BGS	7 ft BGS	15 ft BGS	7 ft BGS	8 ft BGS	21 ft BGS	6 ft BGS	21 ft BGS	7 ft BGS	18 ft BGS
		Residential Soil	*Industrial Soil*												
Parameter	*Units*	*Criteria*	*Criteria*												
		a	*b*												
Semi-Volatiles															
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopro	µg/kg	4600	22000	110 U	110 U	130 U	-	120 U	6800 U	1200 U	2400 U	3000 U	1400 U	150 U	110 U
2,4,5-Trichlorophenol	µg/kg	6100000	62000000	160 U	160 U	200 U	-	180 U	10000 U	1900 U	3600 U	4500 U	2100 U	220 U	160 U
2,4,6-Trichlorophenol	µg/kg	44000	160000	160 U	160 U	200 U	-	180 U	10000 U	1900 U	3600 U	4500 U	2100 U	220 U	160 U
2,4-Dichlorophenol	µg/kg	180000	1800000	160 U	160 U	200 U	-	180 U	10000 U	1900 U	3600 U	4500 U	2100 U	220 U	160 U
2,4-Dimethylphenol	µg/kg	1200000	12000000	160 U	160 U	200 U	-	180 U	10000 U	1900 U	3600 U	4500 U	2100 U	220 U	160 U
2,4-Dinitrophenol	µg/kg	120000	1200000	350 U	350 U	430 U	-	350 U	22000 U	4100 U	8000 U	9900 U	4600 U	490 U	350 U
2,4-Dinitrotoluene	µg/kg	1600	5900	210 U	210 U	260 U	-	240 U	14000 U	2500 U	4900 U	6000 U	2800 U	300 U	210 U
2,6-Dinitrotoluene	µg/kg	61000	620000	210 U	210 U	260 U	-	240 U	14000 U	2500 U	4900 U	6000 U	2800 U	300 U	210 U
2-Chloronaphthalene	µg/kg	6300000	82000000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
2-Chlorophenol	µg/kg	390000	5100000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
2-Methylnaphthalene	µg/kg	310000	4100000	7.1 U	7.0 U	16	-	8.0 U	11000	82 U	160 U	420	250	9.9 U	7.2 U
2-Methylphenol	µg/kg	3100000	31000000	210 UJ	210 UJ	260 U	-	240 UJ	14000 U	2500 U	4900 U	6000 U	2800 U	300 UJ	210 UJ
2-Nitroaniline	µg/kg	610000	6000000	210 U	210 U	260 U	-	240 U	14000 U	2500 U	4900 U	6000 U	2800 U	300 U	210 U
2-Nitrophenol	µg/kg	-	-	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
3,3'-Dichlorobenzidine	µg/kg	1100	3800	110 U	110 U	130 U	-	120 U	6800 U	1200 U	2400 U	3000 U	1400 U	150 U	110 U
3-Nitroaniline	µg/kg	-	-	210 U	210 U	260 U	-	240 U	14000 U	2500 U	4900 U	6000 U	2800 U	300 U	210 U
4,6-Dinitro-2-methylphenol	µg/kg	6100	62000	160 U	160 U	200 U	-	180 U	10000 U	1900 U	3600 U	4500 U	2100 U	220 U	160 U
4-Bromophenyl phenyl ether	µg/kg	-	-	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
4-Chloro-3-methylphenol	µg/kg	6100000	62000000	160 U	160 U	200 U	-	180 U	10000 U	1900 U	3600 U	4500 U	2100 U	220 U	160 U
4-Chloroaniline	µg/kg	2400	8600	160 U	160 U	200 U	-	180 U	10000 U	1900 U	3600 U	4500 U	2100 U	220 U	160 U
4-Chlorophenyl phenyl ether	µg/kg	-	-	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
4-Methylphenol	µg/kg	310000	3100000	210 U	210 U	260 U	-	240 U	14000 U	2500 U	4900 U	6000 U	2800 U	300 U	210 U
4-Nitroaniline	µg/kg	24000	86000	210 U	210 U	260 U	-	240 U	14000 U	2500 U	4900 U	6000 U	2800 U	300 U	210 U
4-Nitrophenol	µg/kg	-	-	350 U	350 U	430 U	-	390 U	22000 U	4100 U	8000 U	9900 U	4600 U	490 U	350 U
Acenaphthene	µg/kg	3400000	33000000	7.1 U	7.0 U	12	-	8.0 U	1000	82 U	160 U	200 U	93 U	9.9 U	7.2 U
Acenaphthylene	µg/kg	-	-	7.1 U	7.0 U	120	-	8.0 U	450 U	82 U	160 U	200 U	93 U	9.9 U	7.2 U
Acetophenone	µg/kg	7800000	100000000	110 U	110 U	130 U	-	120 U	6800 U	1200 U	2400 U	3000 U	1400 U	150 U	110 U
Anthracene	µg/kg	17000000	170000000	7.1 U	9.8	110	-	20	450 U	82 U	160 U	200 U	93 U	9.9 U	7.2 U
Atrazine	µg/kg	2100	7500	210 U	210 U	260 U	-	240 U	14000 U	2500 U	4900 U	6000 U	2800 U	300 U	210 U
Benzaldehyde	µg/kg	7800000	100000000	110 U	110 U	130 U	-	120 U	6800 U	1200 U	2400 U	3000 U	1400 U	150 U	110 U
Benzo(a)anthracene	µg/kg	150	2100	48	21	750*	-	57	450 U	82 U	160 U	200 U	260*	9.9 U	7.2 U
Benzo(a)pyrene	µg/kg	15	210	59*	18*	660*	-	51*	450 U	82 U	160 U	540*	250*	9.9 U	7.2 U
Benzo(b)fluoranthene	µg/kg	150	2100	78	20	950*	-	59	450 U	110*	160 U	690*	310*	9.9 U	7.2 U
Benzo(g,h,i)perylene	µg/kg	-	-	44	11	420	-	28	450 U	82 U	160 U	510	220	9.9 U	7.2 U
Benzo(k)fluoranthene	µg/kg	1500	21000	36	9.7	370	-	27	450 U	82 U	160 U	310	150	9.9 U	7.2 U
Biphenyl (1,1-Biphenyl)	µg/kg	3900000	51000000	53 U	53 U	66 U	-	60 U	1600 J	620 U	1200 U	1500 U	700 U	74 U	54 U
bis(2-Chloroethoxy)methane	µg/kg	180000	1800000	110 U	110 U	130 U	-	120 U	6800 U	1200 U	2400 U	3000 U	1400 U	150 U	110 U
bis(2-Chloroethyl)ether	µg/kg	210	1000	110 U	110 U	130 U	-	120 U	6800 U	1200 U	2400 U	3000 U	1400 U	150 U	110 U
bis(2-Ethylhexyl)phthalate (DEHP)	µg/kg	35000	120000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Butyl benzylphthalate (BBP)	µg/kg	260000	910000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Caprolactam	µg/kg	31000000	310000000	350 U	350 U	430 U	-	390 U	22000 U	4100 U	8000 U	9900 U	4600 U	490 U	350 U
Carbazole	µg/kg	-	-	53 U	53 U	69	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Chrysene	µg/kg	15000	210000	60	19	600	-	53	1200	82 U	160 U	510	250	9.9 U	7.2 U
Dibenz(a,h)anthracene	µg/kg	15	210	7.1 U	7.0 U	150*	-	8.0 U	450 U	82 U	160 U	200 U	93 U	9.9 U	7.2 U
Dibenzofuran	µg/kg	78000	1000000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Diethyl phthalate	µg/kg	49000000	490000000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Dimethyl phthalate	µg/kg	-	-	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Di-n-butylphthalate (DBP)	µg/kg	6100000	62000000	53 U	53 U	86	-	60 U	5100	620 U	1200 U	1500 U	700 U	74 U	54 U
Di-n-octyl phthalate (DnOP)	µg/kg	-	-	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Fluoranthene	µg/kg	2300000	22000000	78	43	1100	-	99	1800	230	160 U	880	570	9.9 U	7.2 U
Fluorene	µg/kg	2300000	22000000	7.1 U	7.0 U	20	-	8.0 U	450 U	82 U	160 U	200 U	93 U	9.9 U	7.2 U
Hexachlorobenzene	µg/kg	300	1100	7.1 U	7.0 U	8.8 U	-	8.0 U	450 U	82 U	160 U	200 U	93 U	9.9 U	7.2 U
Hexachlorobutadiene	µg/kg	6200	22000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Hexachlorocyclopentadiene	µg/kg	370000	3700000	350 U	350 U	430 U	-	390 U	22000 U	4100 U	8000 U	9900 U	4600 U	490 U	350 U
Hexachloroethane	µg/kg	35000	120000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Indeno(1,2,3-cd)pyrene	µg/kg	150	2100	37	7.0 U	390*	-	27	450 U	82 U	160 U	350*	190*	9.9 U	7.2 U
Isophorone	µg/kg	510000	1800000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Naphthalene	µg/kg	3600	18000	7.1 U	7.0 U	27	-	8.0 U	15000*	82 U	250	860	430	9.9 U	7.2 U
Nitrobenzene	µg/kg	4800	24000	110 U	110 U	130 U	-	120 U	6800 U	1200 U	2400 U	3000 U	1400 U	150 U	110 U
N-Nitrosodi-n-propylamine	µg/kg	69	250	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
N-Nitrosodiphenylamine	µg/kg	99000	350000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Pentachlorophenol	µg/kg	3000	9000	160 U	160 U	200 U	-	180 U	10000 U	1900 U	3600 U	4500 U	2100 U	220 U	160 U
Phenanthrene	µg/kg	-	-	29	31	250	-	33	2600	150	200	380	250	9.9 U	7.2 U
Phenol	µg/kg	18000000	180000000	53 U	53 U	66 U	-	60 U	3400 U	620 U	1200 U	1500 U	700 U	74 U	54 U
Pyrene	µg/kg	1700000	17000000	58	35	710	-	83	1300	210	240	700	420	9.9 U	7.2 U

TABLE A4.3

TEST PIT / TEST TRENCH ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:				*TT-19*	*TT-19*	*TT-20*	*TT-20*	*TT-20*	*TT-21*	*TT-21*	*TT-21*	*TT-22*	*TT-22*	*TT-23*	*TT-23*
Sample ID:				*S-38443-100708-KMV-059*	*S-38443-100708-KMV-060*	*S-38443-100708-KMV-063*	*S-38443-100708-KMV-065-D*	*S-38443-100708-KMV-064*	*S-38443-100808-KMV-070*	*S-38443-100808-KMV-068*	*S-38443-100808-KMV-069*	*S-38443-100808-KMV-066*	*S-38443-100808-KMV-067*	*S-38443-100608-KMV-052*	*S-38443-100608-KMV-053*
Sample Date:				*10/7/2008*	*10/7/2008*	*10/7/2008*	*10/7/2008*	*10/7/2008*	*10/8/2008*	*10/8/2008*	*10/8/2008*	*10/8/2008*	*10/8/2008*	*10/6/2008*	*10/6/2008*
Sample Depth:				*7 ft BGS*	*9 ft BGS*	*7 ft BGS*	*7 ft BGS*	*15 ft BGS*	*7 ft BGS*	*8 ft BGS*	*21 ft BGS*	*6 ft BGS*	*21 ft BGS*	*7 ft BGS*	*18 ft BGS*
Parameter	*Units*	*Residential Soil Criteria a*	*Industrial Soil Criteria b*												
Metals															
Aluminum	mg/kg	77000	990000	7420	2720	14800	-	4960	5410	6080	6420	20700	6400	21700	3450
Antimony	mg/kg	31	410	5.2 J	6.3 UJ	17.9 J	-	7.2 UJ	12.0 J	4.7 J	22.0 J	19.1 J*	4.1 J	70.1 J*	6.4 UJ
Arsenic	mg/kg	0.39	1.6	7.2**	4.0**	29.3**	-	5.1**	18.2**	13.6**	12.8**	13.4**	33.1**	39.1**	5.3**
Barium	mg/kg	15000	190000	1310	29.5	4370	-	94.1	1170	622	501	1400	377	3500	19.9 J
Beryllium	mg/kg	160	2000	0.30 J	0.53 U	0.62 J	-	0.24 J	0.83 J	1.0 J	0.59 J	0.50 J	2.5 J	0.60 J	0.54 U
Cadmium	mg/kg	70	800	46.1 J	0.39 J	39.1 J	-	0.33 J	37.7 J	2.1 J	64.0 J	11.2 J	21.7 J	3.3 J	0.22 J
Calcium	mg/kg	-	-	49000	119000	52700	-	56800	26000	36900	34200	50200	14700	13500	53100
Chromium	mg/kg	-	-	93.8 J	6.0 J	93.4 J	-	7.7 J	196 J	62.7 J	38.0 J	101 J	32.5 J	1080 J	7.8 J
Cobalt	mg/kg	23	300	14.9	2.5 J	38.9*	-	3.8 J	47.6 J*	6.1 J	11.6 J	11.9 J	14.1 J	317**	3.9 J
Copper	mg/kg	3100	41000	947 J	95.6 J	1000 J	-	23.2 J	21900*	209	1940	2290	518	841 J	9.6 J
Iron	mg/kg	55000	720000	27700	8770	135000*	-	11300	75900*	16800	25200	42100	9140	23600	9260
Lead	mg/kg	400	800	971**	10.2 J	3480**	-	8.0 J	2720**	604*	2210*	6180**	252	17700**	4.3 J
Magnesium	mg/kg	-	-	17100	48300	6120	-	19600	7090 J	14100 J	10300 J	18400 J	4680 J	3060	32800
Manganese	mg/kg	1800	23000	479 J	183 J	997 J	-	386 J	689	291	408	554	80.6	412 J	297 J
Mercury	mg/kg	5.6	34	0.088 J	0.11 U	2.2	-	0.022 J	0.33	0.22	0.20	0.32	0.37	0.084 J	0.11 U
Nickel	mg/kg	1500	20000	34.4 J	8.0 J	377 J	-	9.2 J	415 J	19.3 J	459 J	145 J	25.2 J	45.5 J	11.2 J
Potassium	mg/kg	-	-	1150	613	2150	-	484 J	775	936	2360	660 J	830	1680	560
Selenium	mg/kg	390	5100	26.6 U	26.3 U	164 U	-	29.9 U	3.9 J	3.3 J	0.91 J	37.5 U	7.6 J	3.7 J	26.8 U
Silver	mg/kg	390	5100	0.45 J	1.1 U	2.9	-	1.2 U	4.9 J	0.81 J	1.9 J	5.0 J	1.4 U	2.7	1.1 U
Sodium	mg/kg	-	-	500 J	129 J	1430	-	597 U	447 J	303 J	1060	683 J	193 J	2970	536 U
Thallium	mg/kg	-	-	0.17	0.13 U	0.13 U	-	0.12 U	0.68 U	0.23 U	0.61 U	3.0 U	0.53	3.7 U	0.20
Vanadium	mg/kg	390	5200	20.1	10.1	21.7 J	-	12.8	18.7	26.0	19.6	19.1	44.4	42.4	10.5
Zinc	mg/kg	23000	310000	922	42.7	6970	-	35.8	2330	739	1160	1630	513	19600	33.4
PCBs															
Aroclor-1016 (PCB-1016)	ug/kg	3900	21000	1800 U	35 U	43 U	-	39 U	4500 U	41 U	400 U	50 U	46 U	49 U	35 U
Aroclor-1221 (PCB-1221)	ug/kg	140	540	1800 U	35 U	43 U	-	39 U	4500 U	41 U	400 U	50 U	46 U	49 U	35 U
Aroclor-1232 (PCB-1232)	ug/kg	140	540	1800 U	35 U	43 U	-	39 U	4500 U	41 U	400 U	50 U	46 U	49 U	35 U
Aroclor-1242 (PCB-1242)	ug/kg	220	740	1800 U	35 U	43 U	-	39 U	4500 U	41 U	400 U	50 U	46 U	49 U	35 U
Aroclor-1248 (PCB-1248)	ug/kg	220	740	8100**	56 U	43 U	-	39 U	4500 U	41 U	400 U	50 U	46 U	49 U	35 U
Aroclor-1254 (PCB-1254)	ug/kg	220	740	1800 U	35 U	130	-	39 UJ	21000**	120 J	400 U	51	53	49 UJ	35 UJ
Aroclor-1260 (PCB-1260)	ug/kg	220	740	1300 J**	35 U	43 U	-	39 UJ	4500 U	41 U	400 U	50 U	46 U	49 UJ	35 UJ
Pesticides															
4,4'-DDD	ug/kg	2000	7200	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
4,4'-DDE	ug/kg	1400	5100	49	1.8 U	15 J	-	10 U	400	210 U	210 U	260 U	240 U	13 U	9.1 U
4,4'-DDT	ug/kg	1700	7000	36 UJ	1.8 UJ	45 U	-	10 UJ	230 U	210 U	210 U	260 U	240 U	13 UJ	9.1 UJ
Aldrin	ug/kg	29	100	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
alpha-BHC	ug/kg	77	270	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
alpha-Chlordane	ug/kg	-	-	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
beta-BHC	ug/kg	270	960	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
delta-BHC	ug/kg	-	-	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
Dieldrin	ug/kg	30	110	31 J*	1.8 U	45 U	-	10 U	190 J**	210 U	210 U	260 U	240 U	13 U	9.1 U
Endosulfan I	ug/kg	-	-	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
Endosulfan II	ug/kg	-	-	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
Endosulfan sulfate	ug/kg	-	-	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
Endrin	ug/kg	18000	180000	36 U	1.8 U	45 U	-	10 U	210 J	210 U	210 U	260 U	240 U	13 U	9.1 U
Endrin aldehyde	ug/kg	-	-	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
Endrin ketone	ug/kg	-	-	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
gamma-BHC (lindane)	ug/kg	520	2100	18 J	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
gamma-Chlordane	ug/kg	-	-	30 J	1.8 U	45 U	-	10 U	540 J	210 U	210 U	260 U	240 U	13 U	9.1 U
Heptachlor	ug/kg	110	380	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
Heptachlor epoxide	ug/kg	53	190	36 U	1.8 U	45 U	-	10 U	230 U	210 U	210 U	260 U	240 U	13 U	9.1 U
Methoxychlor	ug/kg	310000	3100000	70 U	3.5 U	87 U	-	20 U	400 J	410 U	400 U	500 U	460 U	24 U	18 U
Toxaphene	ug/kg	440	1600	1400 U	71 U	1800 U	-	400 U	9100 U	8300 U	8100 U	10000 U	9400 U	500 U	360 U
Herbicides															
2,4,5-TP (Silvex)	ug/kg	490000	4900000	21 U	21 U	26 U	-	24 U	2700 U	1200 U	490 U	30 U	1400 U	30 U	21 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	ug/kg	690000	7700000	85 U	84 U	110 U	-	96 U	11000 UJ	4900 UJ	1900 UJ	120 U	5600 UJ	120 U	86 U
General Chemistry															
Cyanide (total)	mg/kg	1600	20000	4.1	0.53 U	0.83	-	0.60 U	70.7	3.4	0.51 J	0.28 J	0.36 J	0.74 U	0.54 U
Total solids	%	-	-	94.0	95.0	76.2	81.5	83.7	73.7	81.0	82.2	66.6	71.5	67.6	93.3

Notes:

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- Not applicable.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*
Sample ID:			*GW-38443-060609-DR-029*	*GW-38443-060609-DR-030*	*GW-38443-060709-DR-031*	*GW-38443-060709-DR-032*	*GW-38443-060709-DR-033*	*GW-38443-060709-DR-034*	*GW-38443-060709-DR-035*	*GW-38443-060709-DR-036*	*GW-38443-060809-DR-038*	*GW-38443-060809-DR-039*	*GW-38443-060809-DR-040*	*GW-38443-060809-DR-041*
Sample Date:			*6/6/2009*	*6/6/2009*	*6/7/2009*	*6/7/2009*	*6/7/2009*	*6/7/2009*	*6/7/2009*	*6/7/2009*	*6/8/2009*	*6/8/2009*	*6/8/2009*	*6/8/2009*
Sample Depth:			*20-27 ft BGS*	*20-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*
	USEPA Regional Screening Levels			*Duplicate*										
Parameter	*MCL* *a*	*TapWater* *b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	4.8	5.0	8.8	8.8	10	11	6.6	9.5	1.7 U	1.7 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.22 J	0.25 J	1.0 U	1.0 U
1,1-Dichloroethene	7	340	0.27 J	0.20 J	0.37 J	0.38 J	0.45 J	0.53 J	0.34 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.6	1.4
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Acetone	-	22000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	0.75 J	0.59 J	0.53 J	0.58 J	0.88 J	0.79 J	0.70 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.1	1.4	10	11	26	24
cis-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
Cyclohexane	-	13000	0.33 J	0.18 J	1.0 U	1.0 U	0.36 J	0.47 J	0.28 J	0.71 J	0.62 J	0.54 J	1.0 UJ	1.0 UJ
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	0.45 J	0.39 J	0.38 J	0.28 J	0.37 J	0.47 J	1.0 U	0.21 J	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	0.42 J	0.41 J	0.42 J	0.39 J	1.0 U	0.40 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.78 J	0.69 J	0.62 J	0.58 J	1.0 UJ
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	2.1 U	1.9 U	1.6 U	1.3 U	1.6 U	1.8 U	1.5 U	1.3 U	1.6 U	1.2 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.38 J	0.32 J	1.5	1.8	0.34 J	0.30 J
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.2	5.2[a]	2.0 U	2.1 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	3.8[a]	3.7[a]
Xylene (total)	10000	200	0.97 J	0.84 J	1.5 J	0.94 J	1.2 J	1.4 J	0.49 J	0.47 J	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*
Sample ID:			*GW-38443-060609-DR-029*	*GW-38443-060609-DR-030*	*GW-38443-060709-DR-031*	*GW-38443-060709-DR-032*	*GW-38443-060709-DR-033*	*GW-38443-060709-DR-034*	*GW-38443-060709-DR-035*	*GW-38443-060709-DR-036*	*GW-38443-060809-DR-038*	*GW-38443-060809-DR-039*	*GW-38443-060809-DR-040*	*GW-38443-060809-DR-041*
Sample Date:			*6/6/2009*	*6/6/2009*	*6/7/2009*	*6/7/2009*	*6/7/2009*	*6/7/2009*	*6/7/2009*	*6/7/2009*	*6/8/2009*	*6/8/2009*	*6/8/2009*	*6/8/2009*
Sample Depth:			*20-27 ft BGS*	*20-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*
	USEPA Regional Screening Levels			*Duplicate*										
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	3700	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11000	-	-	-	-	-	-	-	-	-	-	-	-
Atrazine	3	0.29	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	-	18000	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	71	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11000	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1100	-	-	-	-	-	-	-	-	-	-	-	-
Metals														
Arsenic	10	0.045	34.9[a]	25.3[a]	5.3	2.1 J	38.3[a]	47.9[a]	27.6[a]	36.8[a]	27.0[a]	17.6[a]	2.9 J	2.9 J
Arsenic (dissolved)	10	0.045	1.1 J	0.94 J	1.1 J	1.0 J	1.1 J	1.1 J	1.3 J	1.2 J	1.1 J	1.4 J	2.4 J	2.0 J
Lead	15	-	29.2[a]	21.4[a]	3.4	1.1	48.1[a]	37.1[a]	31.8[a]	37.9[a]	23.4[a]	13.5	1.4	0.75 J
Lead (dissolved)	15	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*
Sample ID:			*GW-38443-060909-DR-042*	*GW-38443-060909-DR-043*	*GW-38443-060909-DR-044*	*GW-38443-060909-DR-045*	*GW-38443-060909-DR-046*	*GW-38443-060909-DR-047*	*GW-38443-060909-DR-048*	*GW-38443-060909-DR-049*	*GW-38443-060909-DR-050*	*GW-38443-060909-DR-051*	*GW-38443-060909-DR-052*	*GW-38443-060909-DR-053*
Sample Date:			*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*
Sample Depth:			*77-82 ft BGS*	*82-87 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*97-102 ft BGS*	*102-107 ft BGS*	*107-112 ft BGS*	*107-112 ft BGS*	*112-117 ft BGS*	*117-122 ft BGS*	*122-127 ft BGS*
	USEPA Regional Screening Levels				*Duplicate*						*Duplicate*			
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	0.84 J	0.71 J	0.73 J	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	3.7 J	3.8 J	2.8 J
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U.
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.52 J	1.0 U
cis-1,2-Dichloroethene	70	370	0.80 J	0.70 J	0.67 J	1.8	1.8	0.36 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	-	13000	0.58 J	0.58 J	0.57 J	1.0 U	1.0 U	0.18 J	0.15 J	0.12 J	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	0.65 J	0.65 J	0.66 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Toluene	1000	2300	1.0 U	1.0 U	1.0 U	1.2	0.90 J	1.1	0.87 J	0.50 J	0.52 J	0.58 J	0.36 J	0.49 J
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	4.3[a]	4.6[a]	4.6[a]	4.2[a]	4.3[a]	11[a]	19[a]	2.3[a]	2.2[a]	2.2[a]	0.45 J	0.44 J
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*	*MW-213-VAS*
Sample ID:			*GW-38443-060809-DR-042*	*GW-38443-060809-DR-043*	*GW-38443-060809-DR-044*	*GW-38443-060909-DR-045*	*GW-38443-060909-DR-046*	*GW-38443-060909-DR-047*	*GW-38443-060909-DR-048*	*GW-38443-060909-DR-049*	*GW-38443-060909-DR-050*	*GW-38443-060909-DR-051*	*GW-38443-060909-DR-052*	*GW-38443-060909-DR-053*
Sample Date:			*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*	*6/9/2009*
Sample Depth:			*77-82 ft BGS*	*82-87 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*97-102 ft BGS*	*102-107 ft BGS*	*107-112 ft BGS*	*107-112 ft BGS*	*112-117 ft BGS*	*117-122 ft BGS*	*122-127 ft BGS*
	USEPA Regional Screening Levels				*Duplicate*						*Duplicate*			
Parameter	*MCL* *a*	*TapWater* *b*												
4-Chloroaniline	-	0.34	-	-	-	-	-	-	-	-	-	-	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	3700	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11000	-	-	-	-	-	-	-	-	-	-	-	-
Atrazine	3	0.29	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	-	18000	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	71	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11000	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1100	-	-	-	-	-	-	-	-	-	-	-	-
Metals														
Arsenic	10	0.045	38.5[a]	26.0[a]	22.6[a]	8.7	12.6[a]	36.9[a]	13.7[a]	16.6[a]	12.0[a]	16.0[a]	8.9	12.4[a]
Arsenic (dissolved)	10	0.045	4.9 J	4.8 J	5.2	5.1	4.6 J	2.5 J	2.2 J	1.7 J	1.6 J	1.4 J	1.4 J	1.1 J
Lead	15	-	73.0[a]	41.6[a]	40.4[a]	13.3	34.0[a]	32.6[a]	22.2[a]	28.5[a]	20.1[a]	27.1[a]	16.2[a]	22.6[a]
Lead (dissolved)	15	-	1.0 U	1.1 J	2.2 J	1.0 U	0.45 J	1.0 U	1.0 U	0.40 J	0.22 J	1.0 U	1.0 U	1.0 U

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-213-VAS*	*MW-213-VAS*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*
Sample ID:			*GW-38443-061009-DR-055*	*GW-38443-061009-DR-056*	*GW-38443-110508-BW-101*	*GW-38443-110508-BW-102*	*GW-38443-110508-BW-103*	*GW-38443-110508-BW-104*	*GW-38443-110608-BW-105*	*GW-38443-110608-BW-106*	*GW-38443-110608-BW-107*	*GW-38443-110708-BW-108*	*GW-38443-110708-BW-109*	*GW-38443-111008-DD-110*
Sample Date:			*6/10/2009*	*6/10/2009*	*11/5/2008*	*11/5/2008*	*11/5/2008*	*11/5/2008*	*11/6/2008*	*11/6/2008*	*11/6/2008*	*11/7/2008*	*11/7/2008*	*11/10/2008*
Sample Depth:			*127-132 ft BGS*	*132-137 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*
	USEPA Regional Screening Levels												*Duplicate*	
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.7	0.78 J	1.0 U	0.25 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	0.62 J	0.80 J	0.42 J	0.33 J	0.52 J	0.58 J	0.47 J	0.35 J	0.38 J	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	0.29 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	1.1 J	0.61 J	10 U	10 U	10 U	10 U	9.4 J	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.1 J	10 U	10 U	10 U
Benzene	5	0.41	0.49 J	0.55 J	1.0 U	1.0 U	1.0 U	0.29 J	1.0 U	1.0 U	0.35 J	0.23 J	0.23 J	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	3.6	5.9	1.5	0.58 J	1.6	3.5	2.6	4.8	4.6	0.94 J
cis-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	1.0 U	1.0 U	0.36 J	0.22 J	0.18 J	0.28 J	1.0 U	0.19 J	0.25 J	0.13 J	0.13 J	1.0 UJ
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.21 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 UJ	1.0 UJ	0.36 J	0.29 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	1.0 U	1.0 U	0.52 J	0.38 J	0.39 J	0.82 J	0.25 J	0.36 J	0.54 J	0.32 J	0.31 J	1.0 U
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	0.19 J	0.27 J	1.0 U	1.0 U	1.0 U	0.42 J	0.30 J	0.41 J	0.43 J	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Trichloroethene	5	2	1.0 U	1.0 U	2.1	1.3	0.54 J	1.4	1.4	1.0 U	0.34 J	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	4.4[a]	4.7[a]	1.0 U	1.3	0.62 J	0.41 J	1.0	0.28 J	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	5.0 U	-	-	-	-	5.0 U	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	5.0 U	-	-	-	-	5.0 U	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	5.0 U	-	-	-	-	5.0 U	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	5.0 U	-	-	-	-	5.0 U	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	5.0 U	-	-	-	-	5.0 U	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	1.0 UJ	-	-	-	-	1.0 UJ	-	-	-	-
2-Chlorophenol	-	180	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
2-Methylnaphthalene	-	150	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
2-Methylphenol	-	1800	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
2-Nitroaniline	-	370	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-
2-Nitrophenol	-	-	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	5.0 U	-	-	-	-	5.0 U	-	-	-	-
3-Nitroaniline	-	-	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	5.0 U	-	-	-	-	5.0 U	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*MW-213-VAS*	*MW-213-VAS*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*	*VAS-1*
Sample ID:			*GW-38443-061009-DR-055*	*GW-38443-061009-DR-056*	*GW-38443-110508-BW-101*	*GW-38443-110508-BW-102*	*GW-38443-110508-BW-103*	*GW-38443-110508-BW-104*	*GW-38443-110508-BW-105*	*GW-38443-110508-BW-106*	*GW-38443-110508-BW-107*	*GW-38443-110708-BW-108*	*GW-38443-110708-BW-109*	*GW-38443-111008-DD-110*
Sample Date:			*6/10/2009*	*6/10/2009*	*11/5/2008*	*11/5/2008*	*11/5/2008*	*11/5/2008*	*11/5/2008*	*11/5/2008*	*11/5/2008*	*11/7/2008*	*11/7/2008*	*11/10/2008*
Sample Depth:			*127-132 ft BGS*	*132-137 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*
	USEPA Regional Screening Levels												*Duplicate*	
Parameter	*MCL* a	*TapWater* b												
4-Chloroaniline	-	0.34	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-
4-Methylphenol	-	180	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
4-Nitroaniline	-	3.4	-	-	2.0 U	-	-	-	-	2.0 U	-	-	-	-
4-Nitrophenol	-	-	-	-	5.0 U	-	-	-	-	5.0 U	-	-	-	-
Acenaphthene	-	2200	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Acenaphthylene	-	-	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Acetophenone	-	3700	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Anthracene	-	11000	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Atrazine	3	0.29	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Benzaldehyde	-	3700	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	1.0 UJ	-	-	-	-	1.0 UJ	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	0.85 J	-	-	-	-	2.0 U	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Caprolactam	-	18000	-	-	5.0 UJ	-	-	-	-	5.0 UJ	-	-	-	-
Carbazole	-	-	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Chrysene	-	2.9	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Dibenzofuran	-	37	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Diethyl phthalate	-	29000	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Dimethyl phthalate	-	-	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Fluoranthene	-	1500	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Fluorene	-	1500	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	10 U	-	-	-	-	10 U	-	-	-	-
Hexachloroethane	-	4.8	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Isophorone	-	71	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Naphthalene	-	0.14	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Nitrobenzene	-	0.12	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Pentachlorophenol	1	0.56	-	-	5.0 U	-	-	-	-	5.0 U	-	-	-	-
Phenanthrene	-	-	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Phenol	-	11000	-	-	1.0 U	-	-	-	-	1.0 U	-	-	-	-
Pyrene	-	1100	-	-	0.20 U	-	-	-	-	0.20 U	-	-	-	-
Metals														
Arsenic	10	0.045	3.6 J	4.7 J	76.1[a]	121[a]	213[a]	128[a]	3.7 J	34.8[a]	17.6[a]	6.8	8.0	12.1 J[a]
Arsenic (dissolved)	10	0.045	1.0 J	0.89 J	-	-	-	-	-	-	-	-	-	-
Lead	15	-	4.0	6.1	27.6[a]	13.0	34.5[a]	38.7[a]	2.4	25.1[a]	13.9	4.6	5.5	13.5
Lead (dissolved)	15	-	1.0 U	1.0 U	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-1*	*VAS-1*	*VAS-1*	*VAS-2*	*VAS-2*	*VAS-2*	*VAS-2*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*
Sample ID:			*GW-38443-111008-DD-111*	*GW-38443-111008-DD-112*	*GW-38443-111108-DD-113*	*GW-38443-010909-KMV-108*	*GW-38443-010909-KMV-109*	*GW-38443-010909-KMV-110*	*GW-38443-010909-KMV-111*	*GW-38443-111208-DD-114*	*GW-38443-111208-DD-115*	*GW-38443-111208-DD-116*	*GW-38443-111208-DD-117*	*GW-38443-111208-DD-118*
Sample Date:			*11/10/2008*	*11/10/2008*	*11/11/2008*	*1/9/2009*	*1/9/2009*	*1/9/2009*	*1/9/2009*	*11/12/2008*	*11/12/2008*	*11/12/2008*	*11/12/2008*	*11/12/2008*
Sample Depth:			*82.5-87.5 ft BGS*	*87.5-92 ft BGS*	*92-97 ft BGS*	*45-50 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*65-70 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*
	USEPA Regional Screening Levels								*Duplicate*				*Duplicate*	
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	0.49 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	0.96 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	10 U	10 U	10 UJ	3.6 J	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	0.54 J	1.0 U	1.0 U	1.0 U	0.44 J	1.0 U	1.0 U	1.0 U	0.25 J
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Bromomethane (Methyl bromide)	-	8.7	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	0.45 J	0.31 J	0.21 J	2.2	0.51 J	0.45 J	0.45 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	1.0 UJ	1.0 UJ	1.0 UJ	0.41 J	0.15 J	0.15 J	0.16 J	0.34 J	1.0 UJ	1.0 UJ	1.0 UJ	0.19 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	1.0 U	1.0 U	1.0 UJ	0.24 J	1.0 U	1.0 U	1.0 U	0.34 J	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	0.65 J	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Methyl tert butyl ether (MTBE)	-	12	5.0 UJ	5.0 UJ	5.0 U	0.19 J	5.0 U	5.0 U	5.0 U	0.21 J	0.30 J	0.33 J	0.34 J	5.0 U
Methylene chloride	5	4.8	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	1.0 U	1.0 U	1.0 U	1.0	0.54 J	0.59 J	0.53 J	1.2	0.20 J	1.0 U	1.0 U	0.38 J
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	6.0*	0.83 J	0.61 J	0.59 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	0.59 J	2.0 U	2.0 U	2.0 U	0.72 J	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	1.0 UJ	1.0 U	1.0 U	-	-	1.0 U	1.0 UJ	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	-	-
2,4-Dichlorophenol	-	110	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-
2,4-Dimethylphenol	-	730	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-
2,4-Dinitrophenol	-	73	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 UJ	5.0 U	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	-	-
2,6-Dinitrotoluene	-	37	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	-	-
2-Chloronaphthalene	-	2900	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
2-Chlorophenol	-	180	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
2-Methylnaphthalene	-	150	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	-	-	-
2-Methylphenol	-	1800	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
2-Nitroaniline	-	370	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-
2-Nitrophenol	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	-	-
3-Nitroaniline	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-1*	*VAS-1*	*VAS-1*	*VAS-2*	*VAS-2*	*VAS-2*	*VAS-2*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*
Sample ID:			*GW-38443-111008-DD-111*	*GW-38443-111008-DD-112*	*GW-38443-111108-DD-113*	*GW-38443-010909-KMV-108*	*GW-38443-010909-KMV-109*	*GW-38443-010909-KMV-110*	*GW-38443-010909-KMV-111*	*GW-38443-111208-DD-114*	*GW-38443-111208-DD-115*	*GW-38443-111208-DD-116*	*GW-38443-111208-DD-117*	*GW-38443-111208-DD-118*
Sample Date:			*11/10/2008*	*11/10/2008*	*11/11/2008*	*1/9/2009*	*1/9/2009*	*1/9/2009*	*1/9/2009*	*11/12/2008*	*11/12/2008*	*11/12/2008*	*11/12/2008*	*11/12/2008*
Sample Depth:			*82.5-87.5 ft BGS*	*87.5-92 ft BGS*	*92-97 ft BGS*	*45-50 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*65-70 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*
	USEPA Regional Screening Levels								*Duplicate*				*Duplicate*	
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-
4-Methylphenol	-	180	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
4-Nitroaniline	-	3.4	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	-	-	-
4-Nitrophenol	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	-	-
Acenaphthene	-	2200	-	-	0.20 U	0.44	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Acenaphthylene	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Acetophenone	-	3700	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Anthracene	-	11000	-	-	0.20 U	0.52	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Atrazine	3	0.29	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Benzaldehyde	-	3700	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Benzo(a)anthracene	-	0.029	-	-	0.20 U	0.68	0.21	-	-	0.20 U	0.20 U	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	0.20 U	1.0[a]	0.73[a]	-	-	0.20 U	0.20 U	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	0.20 U	1.2	0.81	-	-	0.20 U	0.20 U	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	0.20 U	0.90	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	0.20 U	0.29	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	2.0 U	1.5 J	1.8 J	-	-	2.0 U	2.0 U	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Caprolactam	-	18000	-	-	5.0 U	5.0 U	5.0 UJ	-	-	5.0 U	5.0 U	-	-	-
Carbazole	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Chrysene	-	2.9	-	-	0.20 U	0.61	0.20	-	-	0.20 U	0.20 U	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Dibenzofuran	-	37	-	-	1.0 U	0.24 J	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Diethyl phthalate	-	29000	-	-	1.0 U	1.2	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Dimethyl phthalate	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	1.0 U	1.0 U	1.0 U	-	-	0.76 J	1.0 U	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Fluoranthene	-	1500	-	-	0.20 U	2.1	0.53	-	-	0.20 U	0.20 U	-	-	-
Fluorene	-	1500	-	-	0.20 U	0.29	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Hexachlorobenzene	1	0.042	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Hexachlorobutadiene	-	0.86	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	10 UJ	10 U	10 U	-	-	10 U	10 UJ	-	-	-
Hexachloroethane	-	4.8	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	0.20 U	0.88	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Isophorone	-	71	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Naphthalene	-	0.14	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	-	-	-
Nitrobenzene	-	0.12	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Pentachlorophenol	1	0.56	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	-	-	-
Phenanthrene	-	-	-	-	0.20 U	1.7	0.48	-	-	0.20 U	0.20 U	-	-	-
Phenol	-	11000	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	-	-	-
Pyrene	-	1100	-	-	0.20 U	1.5	0.41	-	-	0.20 U	0.20 U	-	-	-
Metals														
Arsenic	10	0.045	7.4 J	3.6 J	3.7 J	182[a]	188[a]	125[a]	122[a]	119 J[a]	5.9 J	2.5 J	2.8 J	76.4[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	-	-
Lead	15	-	5.9	0.98 J	0.28 J	515[a]	432[a]	273[a]	279[a]	203[a]	5.3	2.1	2.2	34.8[a]
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*
Sample ID:			*GW-38443-111208-DD-119*	*GW-38443-111308-DD-120*	*GW-38443-111308-DD-121*	*GW-38443-111508-DD-122*	*GW-38443-111508-DD-123*	*GW-38443-111608-DD-124*	*GW-38443-111608-DD-125*	*GW-38443-111608-DD-126*	*GW-38443-111608-DD-127*	*GW-38443-111708-DD-128*	*GW-38443-111708-DD-129*	*GW-38443-111708-DD-130*
Sample Date:			*11/12/2008*	*11/13/2008*	*11/13/2008*	*11/15/2008*	*11/15/2008*	*11/16/2008*	*11/16/2008*	*11/16/2008*	*11/16/2008*	*11/17/2008*	*11/17/2008*	*11/17/2008*
Sample Depth:			*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*58.5-63.5 ft BGS*	*65-67 ft BGS*	*67-63.5 ft BGS*	*73-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-82 ft BGS*	*92-97 ft BGS*	*92-97 ft BGS*
	USEPA Regional Screening Levels													*Duplicate*
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	0.61 J	0.95 J	0.45 J	0.59 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	0.63 J	0.70 J	0.57 J	0.55 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00092	2.0 U	2.0 U	2.0 U	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	1.7 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U
Acetone	-	22000	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	1.0 U	0.27 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	0.31 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	0.18 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	0.14 J	0.29 J	1.0 U	0.13 J	0.14 J	0.14 J	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Dibromochloromethane	-	0.15	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	1.0 UJ	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	0.41 J	0.50 J	0.32 J	6.2	1.2	0.51 J	0.54 J	0.44 J	0.57 J	0.37 J	0.33 J	0.28 J
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Trichloroethene	5	2	1.0 U	1.2	2.3	1.6	2.3	0.31 J	0.32 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	1.0 U	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	5.0 U	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	5.0 U	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	2.0 U	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	2.0 U	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	5.0 UJ	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	5.0 U	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	5.0 U	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	1.0 U	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	-	-	1.0 U	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	0.20 U	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	-	-	1.0 U	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	-	-	2.0 U	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	2.0 U	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	-	R	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	2.0 U	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	5.0 U	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	2.0 U	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	2.0 U	-	-	-	-	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*	*VAS-3*
Sample ID:			*GW-38443-111208-DD-119*	*GW-38443-111308-DD-120*	*GW-38443-111308-DD-121*	*GW-38443-111508-DD-122*	*GW-38443-111508-DD-123*	*GW-38443-111608-DD-124*	*GW-38443-111608-DD-125*	*GW-38443-111608-DD-126*	*GW-38443-111608-DD-127*	*GW-38443-111708-DD-128*	*GW-38443-111708-DD-129*	*GW-38443-111708-DD-130*
Sample Date:			*11/12/2008*	*11/13/2008*	*11/13/2008*	*11/15/2008*	*11/15/2008*	*11/16/2008*	*11/16/2008*	*11/16/2008*	*11/16/2008*	*11/17/2008*	*11/17/2008*	*11/17/2008*
Sample Depth:			*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*58.5-63.5 ft BGS*	*65-67 ft BGS*	*67-68.5 ft BGS*	*73-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*92-97 ft BGS*
	USEPA Regional Screening Levels													*Duplicate*
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	-	2.0 U	-	-	-	-	-	-	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	-	2.0 U	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	1.0 U	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	2.0 U	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	5.0 UJ	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Acetophenone	-	3700	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Anthracene	-	11000	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Atrazine	3	0.29	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	1.0 U	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	1.0 U	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	1.0 U	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U
Butyl benzylphthalate (BBP)	-	35	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Caprolactam	-	18000	-	-	-	5.0 UJ	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Chrysene	-	2.9	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	2.2 U	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Fluorene	-	1500	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	R	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Isophorone	-	71	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	1.0 U	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	1.0 U	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	5.0 U	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Phenol	-	11000	-	-	-	1.0 U	-	-	-	-	-	-	-	-
Pyrene	-	1100	-	-	-	0.20 U	-	-	-	-	-	-	-	-
Metals														
Arsenic	10	0.045	54.5[a]	12.0[a]	9.9	9.4	99.5[a]	24.8[a]	24.4[a]	33.1[a]	23.5[a]	23.5[a]	19.5[a]	21.9[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	-	-
Lead	15	-	24.8[a]	13.0	10.7	29.4[a]	180[a]	40.5[a]	37.5[a]	65.5[a]	29.8[a]	32.1[a]	22.8[a]	27.3[a]
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-4*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*
Sample ID:			*GW-38443-110608-KMV-013*	*GW-38443-121508-KMV-088*	*GW-38443-121608-KMV-089*	*GW-38443-121608-KMV-090*	*GW-38443-121608-KMV-091*	*GW-38443-121608-KMV-092*	*GW-38443-121608-KMV-093*	*GW-38443-121608-KMV-094*	*GW-38443-121608-KMV-095*	*GW-38443-121708-KMV-097*	*GW-38443-121708-KMV-098*	*GW-38443-121708-KMV-099*
Sample Date:			*11/6/2008*	*12/15/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/17/2008*	*12/17/2008*	*12/17/2008*
Sample Depth:			*25-30 ft BGS*	*5-10 ft BGS*	*35-40 ft BGS*	*40-45 ft BGS*	*50-55 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*	*80-85 ft BGS*	*85-90 ft BGS*
	USEPA Regional Screening Levels							*Duplicate*						
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	17 U	0.36 J	0.57 J	0.50 J	0.49 J	0.47 J	0.51 J	0.62 J	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	33 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	0.50 J	17 U	0.21 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	0.30 J	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	170 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	170 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	170 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	7.4 J	21 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	17 U	1.0 U	0.72 J	1.0 U	1.0 U	1.0 U	0.48 J	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 UJ	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	0.34 J	17 U	0.68 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	0.83 J	17 U	0.26 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	2.8	5.3 J	5.6	0.66 J	1.0 U	1.0 U	0.26 J	0.64 J	0.62 J	3.4	3.9	4.9
cis-1,3-Dichloropropene	-	-	1.0 UJ	17 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	0.25 J	17 U	0.31 J	0.58 J	0.26 J	0.39 J	0.41 J	0.40 J	0.39 J	0.18 J	0.33 J	0.30 J
Dibromochloromethane	-	0.15	1.0 UJ	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	0.20 J	89	0.45 J	0.34 J	1.0 U	1.0 U	0.22 J	1.0 U	0.27 J	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	1.3	36	0.18 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	170 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	0.96 J	17 U	1.0 U	0.53 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	83 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 UJ	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	17 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Toluene	1000	2300	1.1	9.7 J	0.45 J	1.2	0.63 J	0.77 J	0.85 J	0.77 J	0.92 J	0.38 J	0.55 J	0.60 J
trans-1,2-Dichloroethene	100	110	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.26 J	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 UJ	17 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Trichloroethene	5	2	0.31 J	17 U	1.0 U	0.42 J	2.1	2.1	2.2	2.4	3.5	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 UJ	17 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	0.58 J	17 U	0.23 J	1.0 U	0.28 J	0.28 J	0.55 J	0.98 J	1.4	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	0.57 J	14 J	0.62 J	0.63 J	2.0 U	2.0 U	2.0 U	2.0 U	0.47 J	2.0 U	2.0 U	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	20 U	4.0 U	1.0 UJ	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	100 U	20 U	5.0 U	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	100 U	20 U	5.0 U	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	100 U	20 U	5.0 U	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	100 U	20 U	5.0 U	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	100 U	20 U	5.0 U	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	20 UJ	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	4.0 U	1.7	0.20 U	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	40 U	8.0 U	2.0 UJ	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	100 U	20 U	5.0 U	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	100 U	20 U	5.0 U	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-4*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*	*VAS-5*
Sample ID:			*GW-38443-110608-KMV-013*	*GW-38443-121508-KMV-088*	*GW-38443-121608-KMV-089*	*GW-38443-121608-KMV-090*	*GW-38443-121608-KMV-091*	*GW-38443-121608-KMV-092*	*GW-38443-121608-KMV-093*	*GW-38443-121608-KMV-094*	*GW-38443-121608-KMV-095*	*GW-38443-121708-KMV-097*	*GW-38443-121708-KMV-098*	*GW-38443-121708-KMV-099*
Sample Date:			*11/6/2008*	*12/15/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/17/2008*	*12/17/2008*	*12/17/2008*
Sample Depth:			*25-30 ft BGS*	*5-10 ft BGS*	*35-40 ft BGS*	*40-45 ft BGS*	*50-55 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*	*80-85 ft BGS*	*85-90 ft BGS*
	USEPA Regional Screening Levels							*Duplicate*						
Parameter	*MCL* *a*	*TapWater* *b*												
4-Chloroaniline	-	0.34	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-
Semi-Volatile (continued)														
4-Chlorophenyl phenyl ether	-	-	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	100 U	20 U	5.0 U	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Acetophenone	-	3700	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Anthracene	-	11000	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Atrazine	3	0.29	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	20 UJ	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	40 U	8.0 U	2.0 U	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Caprolactam	-	18000	100 UJ	20 UJ	5.0 UJ	-	-	-	-	-	-	-	-	-
Carbazole	-	-	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Chrysene	-	2.9	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Fluorene	-	1500	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	200 U	40 U	10 U	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Isophorone	-	71	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	4.0 U	15	0.20 U	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	20 U	4.0 U	1.0 UJ	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	100 U	20 U	5.0 U	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Phenol	-	11000	20 U	4.0 U	1.0 U	-	-	-	-	-	-	-	-	-
Pyrene	-	1100	4.0 U	0.80 U	0.20 U	-	-	-	-	-	-	-	-	-
Metals														
Arsenic	10	0.045	249[a]	40.4[a]	75.0[a]	550[a]	107 J[a]	62.2 J[a]	90.8[a]	117[a]	70.4[a]	68.7[a]	71.7[a]	40.2[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	0.68 J	-	-	-	-	-
Lead	15	-	811[a]	1940[a]	88.8[a]	124[a]	75.8[a]	52.4[a]	75.6[a]	73.9[a]	39.3[a]	41.1[a]	81.4[a]	40.7[a]
Lead (dissolved)	15	-	-	-	-	-	-	-	1.0 U	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] = Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-5*	*VAS-5*	*VAS-6*	*VAS-6*	*VAS-6*	*VAS-7*	*VAS-7*	*VAS-7*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*
Sample ID:			*GW-38443-121708-KMV-100*	*GW-38443-121708-KMV-101*	*GW-38443-010709-KMV-105*	*GW-38443-010709-KMV-106*	*GW-38443-010709-KMV-107*	*GW-38443-121908-KMV-102*	*GW-38443-121908-KMV-103*	*GW-38443-121908-KMV-104*	*GW-38443-010909-DD-218*	*GW-38443-010909-DD-219*	*GW-38443-011009-KMV-218*	*GW-38443-011009-KMV-219*
Sample Date:			*12/17/2008*	*12/17/2008*	*1/7/2009*	*1/7/2009*	*1/7/2009*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*1/9/2009*	*1/9/2009*	*1/10/2009*	*1/10/2009*
Sample Depth:			*90-95 ft BGS*	*95-100 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*40-45 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*25-30 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	8.6	4.2	1.6	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.6	1.7	1.7	2.5 J	4.3	4.2	1.0 U	1.5 J	1.3 J	1.1 J
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4.0 U	5.0 U	4.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	2.1 J	1.1 J	0.70 J	10 U	10 U	10 U	10 U	20 U	25 U	20 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	20 U	25 U	20 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	20 U	25 UJ	20 U
Acetone	-	22000	10 U	10 U	12	4.6 J	1.1 J	1.8 J	10 U	10 U	10 U	20 U	25 U	20 U
Benzene	5	0.41	1.0 U	1.0 U	1.5	0.89 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	0.50 J	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 UJ	2.0 UJ
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	0.46 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	0.38 J	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
cis-1,2-Dichloroethene	70	370	5.1	5.3	7.7	4.7	3.4	9.4	11	9.9	1.5	74[a]	64	59
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	2.0 U	2.5 UJ	2.0 U
Cyclohexane	-	13000	0.33 J	0.19 J	0.48 J	0.55 J	0.28 J	0.27 J	0.25 J	0.31 J	0.49 J	0.37 J	2.5 UJ	2.0 U
Dibromochloromethane	-	0.15	1.0 U	1.0 U	0.48 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 UJ
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	2.0 UJ	2.5 UJ	2.0 UJ
Ethylbenzene	700	1.5	1.0 U	1.0 U	20	7.4	2.4	1.0 UJ	1.0 U	1.0 U	0.25 J	2.0 U	2.5 U	2.0 U
Isopropyl benzene	-	680	1.0 U	1.0 U	2.1	0.89 J	0.28 J	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	20 U	25 U	20 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.2 J	1.0 J	1.0 UJ	1.0 U	1.0 U	1.0 U	0.55 J	2.0 UJ	2.5 UJ	2.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	10 U	12 U	10 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	2.0 U	2.5 U	2.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Tetrachloroethene	5	0.11	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Toluene	1000	2300	0.64 J	0.38 J	12	4.7	1.9	0.54 J	0.44 J	0.68 J	2.0	1.5 J	0.92 J	0.47 J
trans-1,2-Dichloroethene	100	110	0.21 J	0.21 J	0.47 J	0.48 J	0.46 J	0.33 J	0.31 J	0.30 J	1.0 U	0.83 J	0.70 J	0.60 J
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Trichloroethene	5	2	1.0 U	1.0 U	10[a]	8.9[a]	5.7[a]	1.2	1.2	1.3	3.2	51[a]	51[a]	42[a]
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 U	2.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.5 UJ	2.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	2.2[a]	0.70 J	0.36 J	2.0	0.82 J	1.0	1.0 U	3.4[a]	2.6 J[a]	2.7[a]
Xylene (total)	10000	200	2.0 U	2.0 U	70	28	7.1	2.0 UJ	2.0 U	2.0 U	0.52 J	4.0 U	5.0 U	4.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	1.0 UJ	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
2,4,5-Trichlorophenol	-	3700	-	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
2,4,6-Trichlorophenol	-	6.1	-	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
2,4-Dichlorophenol	-	110	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
2,4-Dimethylphenol	-	730	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
2,4-Dinitrophenol	-	73	-	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
2,4-Dinitrotoluene	-	0.22	-	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
2,6-Dinitrotoluene	-	37	-	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
2-Chloronaphthalene	-	2900	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
2-Chlorophenol	-	180	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
2-Methylnaphthalene	-	150	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
2-Methylphenol	-	1800	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
2-Nitroaniline	-	370	-	2.0 UJ	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
2-Nitrophenol	-	-	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
3,3'-Dichlorobenzidine	-	0.15	-	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
3-Nitroaniline	-	-	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
4-Bromophenyl phenyl ether	-	-	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
4-Chloro-3-methylphenol	-	3700	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-5*	*VAS-5*	*VAS-6*	*VAS-6*	*VAS-6*	*VAS-7*	*VAS-7*	*VAS-7*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*
Sample ID:			*GW-38443-121708-KMV-100*	*GW-38443-121708-KMV-101*	*GW-38443-010709-KMV-105*	*GW-38443-010709-KMV-106*	*GW-38443-010709-KMV-107*	*GW-38443-121808-KMV-102*	*GW-38443-121808-KMV-103*	*GW-38443-121908-KMV-104*	*GW-38443-010809-DD-218*	*GW-38443-010809-DD-219*	*GW-38443-011009-KMV-218*	*GW-38443-011009-KMV-219*
Sample Date:			*12/17/2008*	*12/17/2008*	*1/7/2009*	*1/7/2009*	*1/7/2009*	*12/18/2008*	*12/18/2008*	*12/19/2008*	*1/8/2009*	*1/8/2009*	*1/10/2009*	*1/10/2009*
Sample Depth:			*90-95 ft BGS*	*95-100 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*40-45 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*25-30 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
4-Methylphenol	-	180	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
4-Nitroaniline	-	3.4	-	2.0 U	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
4-Nitrophenol	-	-	-	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
Acenaphthene	-	2200	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Acenaphthylene	-	-	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Acetophenone	-	3700	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Anthracene	-	11000	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Atrazine	3	0.29	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Benzaldehyde	-	3700	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Benzo(a)anthracene	-	0.029	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Benzo(a)pyrene	0.2	0.0029	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Benzo(b)fluoranthene	-	0.029	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Benzo(g,h,i)perylene	-	-	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Benzo(k)fluoranthene	-	0.29	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
bis(2-Chloroethoxy)methane	-	110	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
bis(2-Chloroethyl)ether	-	0.012	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	2.0 U	2.2	-	1.9 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	-
Butyl benzylphthalate (BBP)	-	35	-	1.0 U	1.1	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Caprolactam	-	18000	-	5.0 UJ	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
Carbazole	-	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Chrysene	-	2.9	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Dibenz(a,h)anthracene	-	0.0029	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Dibenzofuran	-	37	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Diethyl phthalate	-	29000	-	1.0 U	1.3	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Dimethyl phthalate	-	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Di-n-butylphthalate (DBP)	-	3700	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	0.76 J	0.91 J	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Fluoranthene	-	1500	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Fluorene	-	1500	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Hexachlorobenzene	1	0.042	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Hexachlorobutadiene	-	0.86	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Hexachlorocyclopentadiene	50	220	-	10 U	10 U	-	10 U	10 U	10 U	10 U	10 U	10 U	-	-
Hexachloroethane	-	4.8	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Isophorone	-	71	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Naphthalene	-	0.14	-	0.20 U	0.22	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Nitrobenzene	-	0.12	-	1.0 UJ	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
N-Nitrosodiphenylamine	-	14	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Pentachlorophenol	1	0.56	-	5.0 U	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	-
Phenanthrene	-	-	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.36	0.20 U	0.20 U	0.20 U	-	-
Phenol	-	11000	-	1.0 U	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	-
Pyrene	-	1100	-	0.20 U	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	-
Metals														
Arsenic	10	0.045	29.6[a]	20.0[a]	77.5[a]	85.6[a]	28.2[a]	56.7[a]	62.5[a]	22.2[a]	456[a]	132[a]	91.7[a]	-
Arsenic (dissolved)	10	0.045	3.9 J	-	-	0.95 J	-	-	-	2.5 J	-	4.5 J	-	-
Lead	15	-	39.4[a]	18.6[a]	158[a]	106[a]	37.9[a]	126[a]	187[a]	55.7[a]	372[a]	176[a]	118[a]	-
Lead (dissolved)	15	-	1.9	-	-	1.0 U	-	-	-	2.5	-	1.0 U	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-9*	*VAS-9*	*VAS-9*
Sample ID:			*GW-38443-011009-KMV-220*	*GW-38443-011009-KMV-221*	*GW-38443-011009-KMV-222*	*GW-38443-011009-KMV-223*	*GW-38443-011009-KMV-224*	*GW-38443-011009-KMV-225*	*GW-38443-011009-KMV-226*	*GW-38443-011009-KMV-227*	*GW-38443-011009-KMV-228*	*GW-38443-111808-DD-131*	*GW-38443-111808-DD-132*	*GW-38443-111808-DD-133*
Sample Date:			*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*11/18/2008*	*11/18/2008*	*11/18/2008*
Sample Depth:			*47-52 ft BGS*	*52-57 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*47-52 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL*	*TapWater*												
	a	*b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
1,1,2,2-Tetrachloroethane	-	0.067	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
1,1,2-Trichloroethane	5	0.24	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
1,1-Dichloroethane	-	2.4	1.0 J	1.0 J	3.5	2.1 J	1.5 J	0.34 J	0.24 J	0.23 J	1.0 U	0.37 J	120 U	20 U
1,1-Dichloroethene	7	340	2.0 U	2.0 U	3.3 U	0.61 J	0.84 J	0.47 J	0.51 J	0.30 J	0.26 J	1.0 U	120 U	20 U
1,2,4-Trichlorobenzene	70	2.3	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	4.0 U	4.0 U	6.7 U	5.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	250 U	40 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
1,2-Dichlorobenzene	600	370	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
1,2-Dichloroethane	5	0.15	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
1,2-Dichloropropane	5	0.39	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
1,3-Dichlorobenzene	-	-	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
1,4-Dichlorobenzene	75	0.43	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	20 U	20 U	33 U	25 U	20 U	10 U	10 U	10 U	10 U	10 U	1200 U	200 U
2-Hexanone	-	47	20 U	20 U	33 U	25 U	20 U	10 U	10 U	10 U	10 U	10 U	1200 U	200 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	20 U	20 U	33 U	25 U	20 U	10 U	10 U	10 U	10 UJ	10 U	1200 U	200 U
Acetone	-	22000	20 U	20 U	33 U	25 U	20 U	10 U	10 U	10 U	10 U	10 U	1200 U	200 U
Benzene	5	0.41	0.86 J	2.0 U	3.3 U	2.5 U	2.0 U	0.43 J	0.44 J	1.0 U	1.0 U	0.91 J	120 U	20 U
Bromodichloromethane	-	0.12	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	120 UJ	20 UJ
Bromoform	-	8.5	2.0 UJ	2.0 UJ	3.3 UJ	2.5 UJ	2.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	120 U	20 U
Bromomethane (Methyl bromide)	-	8.7	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
Carbon disulfide	-	1000	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
Carbon tetrachloride	5	0.2	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
Chlorobenzene	100	91	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.6	120 U	20 U
Chloroethane	-	21000	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
Chloroform (Trichloromethane)	-	0.19	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
Chloromethane (Methyl chloride)	-	190	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
cis-1,2-Dichloroethene	70	370	64	65	87 J[a]	85[a]	71[a]	23	21	17	16	0.77 J	3900 J[a]	320 J[a]
cis-1,3-Dichloropropene	-	-	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	120 U	20 U
Cyclohexane	-	13000	0.26 J	2.0 U	3.3 U	2.5 U	2.0 U	0.16 J	0.19 J	0.14 J	0.13 J	0.66 J	120 U	20 U
Dibromochloromethane	-	0.15	2.0 UJ	2.0 UJ	3.3 UJ	2.5 UJ	2.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	120 U	20 U
Dichlorodifluoromethane (CFC-12)	-	390	2.0 UJ	2.0 UJ	3.3 UJ	2.5 UJ	2.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	120 UJ	20 UJ
Ethylbenzene	700	1.5	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.35 J	120 U	20 U
Isopropyl benzene	-	680	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
Methyl acetate	-	37000	20 U	20 U	33 U	25 U	20 U	10 U	10 U	10 U	10 U	10 U	1200 U	200 U
Methyl cyclohexane	-	-	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	120 U	20 U
Methyl tert butyl ether (MTBE)	-	12	10 U	10 U	17 U	12 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	0.86 J	620 U	100 U
Methylene chloride	5	4.8	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	7.5 J[a]
Styrene	100	1600	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
Tetrachloroethene	5	0.11	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	120 UJ	20 UJ
Toluene	1000	2300	0.82 J	0.62 J	0.57 J	0.69 J	0.45 J	0.45 J	0.66 J	0.43 J	0.55 J	22	36 J	5.7 J
trans-1,2-Dichloroethene	100	110	0.40 J	0.46 J	3.3 U	0.50 J	0.43 J	1.0 U	1.0 U	0.26 J	0.32 J	1.0 U	120 U	20 U
trans-1,3-Dichloropropene	-	-	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
Trichloroethene	5	2	7.6[a]	3.8	2.3 J	1.6 J	0.74 J	1.0	0.98 J	0.65 J	0.63 J	0.33 J	5100[a]	790[a]
Trichlorofluoromethane (CFC-11)	-	1300	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120 U	20 U
Trifluorotrichloroethane (Freon 113)	-	59000	2.0 U	2.0 U	3.3 U	2.5 U	2.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	120 U	20 U
Vinyl chloride	2	0.016	3.1[a]	3.0[a]	20 J[a]	35[a]	34[a]	7.7[a]	7.0[a]	2.8[a]	2.1 J[a]	0.97 J	760[a]	8.6 J[a]
Xylene (total)	10000	200	4.0 U	4.0 U	6.7 U	5.0 U	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1.8 J	250 U	40 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
2,4,5-Trichlorophenol	-	3700	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-
2,4,6-Trichlorophenol	-	6.1	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-
2,4-Dichlorophenol	-	110	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-
2,4-Dimethylphenol	-	730	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-
2,4-Dinitrophenol	-	73	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-
2,4-Dinitrotoluene	-	0.22	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-
2,6-Dinitrotoluene	-	37	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-
2-Chloronaphthalene	-	2900	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
2-Chlorophenol	-	180	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
2-Methylnaphthalene	-	150	-	-	0.20 U	-	-	-	-	-	0.20 U	0.42	0.20 U	-
2-Methylphenol	-	1800	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
2-Nitroaniline	-	370	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-
2-Nitrophenol	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-
3,3'-Dichlorobenzidine	-	0.15	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-
3-Nitroaniline	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-
4-Bromophenyl phenyl ether	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-
4-Chloro-3-methylphenol	-	3700	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-8*	*VAS-9*	*VAS-9*	*VAS-9*
Sample ID:			*GW-38443-011009-KMV-220*	*GW-38443-011009-KMV-221*	*GW-38443-011009-KMV-222*	*GW-38443-011009-KMV-223*	*GW-38443-011009-KMV-224*	*GW-38443-011009-KMV-225*	*GW-38443-011009-KMV-226*	*GW-38443-011009-KMV-227*	*GW-38443-011009-KMV-228*	*GW-38443-111008-DD-131*	*GW-38443-111008-DD-132*	*GW-38443-111008-DD-133*
Sample Date:			*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*1/10/2009*	*11/18/2008*	*11/18/2008*	*11/18/2008*
Sample Depth:			*47-52 ft BGS*	*52-57 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*47-52 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-
4-Methylphenol	-	180	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
4-Nitroaniline	-	3.4	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-
4-Nitrophenol	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-
Acenaphthene	-	2200	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Acenaphthylene	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Acetophenone	-	3700	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Anthracene	-	11000	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Atrazine	3	0.29	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Benzaldehyde	-	3700	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Benzo(a)anthracene	-	0.029	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Benzo(a)pyrene	0.2	0.0029	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Benzo(b)fluoranthene	-	0.029	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Benzo(g,h,i)perylene	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Benzo(k)fluoranthene	-	0.29	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
bis(2-Chloroethoxy)methane	-	110	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
bis(2-Chloroethyl)ether	-	0.012	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	1.0 J	-	-	-	-	-	0.95 J	2.0 U	2.0 U	-
Butyl benzylphthalate (BBP)	-	35	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Caprolactam	-	18000	-	-	5.0 UJ	-	-	-	-	-	5.0 UJ	5.0 U	5.0 U	-
Carbazole	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Chrysene	-	2.9	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Dibenz(a,h)anthracene	-	0.0029	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Dibenzofuran	-	37	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Diethyl phthalate	-	29000	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Dimethyl phthalate	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Di-n-butylphthalate (DBP)	-	3700	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Fluoranthene	-	1500	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Fluorene	-	1500	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Hexachlorobenzene	1	0.042	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Hexachlorobutadiene	-	0.86	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Hexachlorocyclopentadiene	50	220	-	-	10 U	-	-	-	-	-	10 U	10 UJ	10 UJ	-
Hexachloroethane	-	4.8	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Isophorone	-	71	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Naphthalene	-	0.14	-	-	0.20 U	-	-	-	-	-	0.20 U	0.21	0.19 J	-
Nitrobenzene	-	0.12	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
N-Nitrosodiphenylamine	-	14	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Pentachlorophenol	1	0.56	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-
Phenanthrene	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Phenol	-	11000	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-
Pyrene	-	1100	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-
Metals														
Arsenic	10	0.045	50.9[a]	37.6[a]	74.1[a]	57.0[a]	29.6[a]	66.5[a]	29.2[a]	42.9[a]	24.9[a]	19.2[a]	19.7[a]	31.9[a]
Arsenic (dissolved)	10	0.045	-	-	5.8	-	-	-	-	-	-	-	-	-
Lead	15	-	117[a]	66.5[a]	164[a]	145[a]	60.3[a]	158[a]	57.5[a]	96.8[a]	69.5[a]	356[a]	87.4[a]	236[a]
Lead (dissolved)	15	-	-	-	1.0 U	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-11*	*VAS-11*
Sample ID:			*GW-38443-111808-DD-134*	*GW-38443-111908-DD-135*	*GW-38443-111908-DD-136*	*GW-38443-111908-DD-137*	*GW-38443-111908-DD-138*	*GW-38443-111908-DD-139*	*GW-38443-111908-DD-140*	*GW-38443-112008-DD-141*	*GW-38443-112008-DD-142*	*GW-38443-112008-DD-143*	*GW-38443-120808-DD-175*	*GW-38443-120808-DD-176*
Sample Date:			*11/18/2008*	*11/19/2008*	*11/19/2008*	*11/19/2008*	*11/19/2008*	*11/19/2008*	*11/19/2008*	*11/20/2008*	*11/20/2008*	*11/20/2008*	*12/8/2008*	*12/8/2008*
Sample Depth:			*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*92-97 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*
	USEPA Regional Screening Levels											*Duplicate*		
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	0.40 J
1,1,2,2-Tetrachloroethane	-	0.067	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 UJ	1.0 U
1,1-Dichloroethane	-	2.4	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	2.9
1,1-Dichloroethene	7	340	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	25 U	11 U	10 U	6.7 U	3.3 U	2.0 U	3.3 U	5.0 U	2.0 U	2.0 U	10 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
1,2-Dichlorobenzene	600	370	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
1,2-Dichloroethane	5	0.15	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
1,2-Dichloropropane	5	0.39	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 UJ	1.0 U
1,3-Dichlorobenzene	-	-	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	120 U	57 U	50 U	33 U	17 U	10 U	17 U	25 U	10 U	10 U	50 U	10 U
2-Hexanone	-	47	120 U	57 U	50 U	33 U	17 U	10 U	17 U	25 U	10 U	10 U	50 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	120 U	57 U	50 U	33 U	17 U	10 U	17 U	25 U	10 U	10 U	50 U	10 U
Acetone	-	22000	120 U	57 U	50 U	33 U	17 UJ	10 U	17 U	25 U	10 U	10 UJ	50 U	10 U
Benzene	5	0.41	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	2.4 J	0.56 J
Bromodichloromethane	-	0.12	12 UJ	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 UJ	1.0 U
Bromoform	-	8.5	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Carbon disulfide	-	1000	12 U	5.7 U	5.0 U	3.3 U	1.7 U	0.29 J	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Carbon tetrachloride	5	0.2	12 U	5.7 U	5.0 U	3.3 U	1.7 UJ	1.0 U	1.7 U	2.5 U	1.0 U	1.0 UJ	5.0 U	1.0 U
Chlorobenzene	100	91	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	130[a]	5.8
Chloroethane	-	21000	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	6.1	1.0 U
Chloroform (Trichloromethane)	-	0.19	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	260 J[a]	88[a]	51	49	23	25	30	45	23	21	5.0 U	5.2
cis-1,3-Dichloropropene	-	-	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 UJ	1.0 UJ
Cyclohexane	-	13000	12 U	5.7 U	5.0 U	3.3 U	1.7 U	0.12 J	1.7 U	2.5 U	1.0 U	1.0 U	0.92 J	0.49 J
Dibromochloromethane	-	0.15	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	590	12 UJ	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 UJ	0.28 J
Isopropyl benzene	-	680	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Methyl acetate	-	37000	120 U	57 U	50 U	33 U	17 U	10 U	17 U	25 U	10 U	10 U	50 U	10 U
Methyl cyclohexane	-	-	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	0.52 J
Methyl tert butyl ether (MTBE)	-	12	62 U	29 U	25 U	17 U	8.4 U	5.0 U	8.4 U	12 U	5.0 U	5.0 U	25 U	5.0 U
Methylene chloride	5	4.8	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Styrene	100	1600	12 U	5.7 U	5.0 U	3.3 U	0.90 J	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Tetrachloroethene	5	0.11	12 UJ	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 UJ	4.6
Toluene	1000	2300	4.9 J	1.9 J	2.0 J	1.5 J	1.6 J	0.56 J	1.1 J	2.2 J	2.4	2.2	2.4 J	2.3
trans-1,2-Dichloroethene	100	110	12 U	5.7 U	5.0 U	3.3 U	1.7 U	0.60 J	0.49 J	0.61 J	0.39 J	0.34 J	5.0 U	0.19 J
trans-1,3-Dichloropropene	-	-	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 UJ	1.0 UJ
Trichloroethene	5	2	610[a]	220[a]	150[a]	120[a]	56[a]	38[a]	57[a]	78[a]	31[a]	28[a]	5.0 U	2.5
Trichlorofluoromethane (CFC-11)	-	1300	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	12 U	5.7 U	5.0 U	3.3 U	1.7 U	1.0 U	1.7 U	2.5 U	1.0 U	1.0 U	5.0 U	1.0 U
Vinyl chloride	2	0.016	7.2 J[a]	2.3 J[a]	1.6 J	0.99 J	0.58 J	0.28 J	0.37 J	0.92 J	0.67 J	0.63 J	5.0 UJ	3.7[a]
Xylene (total)	10000	200	25 U	11 U	10 U	6.7 U	3.3 U	2.0 U	3.3 U	5.0 U	2.0 U	2.0 U	10 UJ	0.60 J
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
2,4,5-Trichlorophenol	-	3700	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	-	6.1	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dichlorophenol	-	110	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dimethylphenol	-	730	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dinitrophenol	-	73	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrotoluene	-	0.22	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2,6-Dinitrotoluene	-	37	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene	-	2900	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorophenol	-	180	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
2-Methylnaphthalene	-	150	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylphenol	-	1800	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitroaniline	-	370	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
2-Nitrophenol	-	-	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
3,3'-Dichlorobenzidine	-	0.15	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	R	5.0 U
3-Nitroaniline	-	-	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
4,6-Dinitro-2-methylphenol	-	3.7	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	5.0 U	5.0 U
4-Bromophenyl phenyl ether	-	-	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloro-3-methylphenol	-	3700	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-9*	*VAS-11*	*VAS-11*
Sample ID:			*GW-38443-111908-DD-134*	*GW-38443-111908-DD-135*	*GW-38443-111908-DD-136*	*GW-38443-111908-DD-137*	*GW-38443-111908-DD-138*	*GW-38443-111908-DD-139*	*GW-38443-111908-DD-140*	*GW-38443-112008-DD-141*	*GW-38443-112008-DD-142*	*GW-38443-112008-DD-143*	*GW-38443-120908-DD-175*	*GW-38443-120908-DD-176*
Sample Date:			*11/18/2008*	*11/19/2008*	*11/19/2008*	*11/19/2008*	*11/19/2008*	*11/19/2008*	*11/19/2008*	*11/20/2008*	*11/20/2008*	*11/20/2008*	*12/9/2008*	*12/9/2008*
Sample Depth:			*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*92-97 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*
	USEPA Regional Screening Levels											*Duplicate*		
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
4-Methylphenol	-	180	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
4-Nitroaniline	-	3.4	-	2.0 U	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	2.0 U
4-Nitrophenol	-	-	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthene	-	2200	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	-	-	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Acetophenone	-	3700	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	-	11000	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Atrazine	3	0.29	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Benzaldehyde	-	3700	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)anthracene	-	0.029	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)pyrene	0.2	0.0029	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(b)fluoranthene	-	0.029	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	-	-	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(k)fluoranthene	-	0.29	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Biphenyl (1,1-Biphenyl)	-	1800	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethoxy)methane	-	110	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethyl)ether	-	0.012	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	2.0 U	-	-	-	-	-	-	2.0 U	2.4 U	2.0 U	2.0 U
Butyl benzylphthalate (BBP)	-	35	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Caprolactam	-	18000	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	R	5.0 UJ
Carbazole	-	-	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Chrysene	-	2.9	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(a,h)anthracene	-	0.0029	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Dibenzofuran	-	37	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Diethyl phthalate	-	29000	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Dimethyl phthalate	-	-	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-butylphthalate (DBP)	-	3700	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-octyl phthalate (DnOP)	-	-	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene	-	1500	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.19 J
Fluorene	-	1500	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.42
Hexachlorobenzene	1	0.042	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobutadiene	-	0.86	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorocyclopentadiene	50	220	-	10 U	-	-	-	-	-	-	10 U	10 U	10 U	10 U
Hexachloroethane	-	4.8	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Indeno(1,2,3-cd)pyrene	-	0.029	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Isophorone	-	71	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	-	0.14	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Nitrobenzene	-	0.12	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodi-n-propylamine	-	0.0096	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodiphenylamine	-	14	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	1	0.56	-	5.0 U	-	-	-	-	-	-	5.0 U	5.0 U	R	5.0 U
Phenanthrene	-	-	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Phenol	-	11000	-	1.0 U	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	-	1100	-	0.20 U	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Metals														
Arsenic	10	0.045	22.4[a]	30.5[a]	16.3[a]	21.9[a]	8.4	11.2[a]	18.0[a]	17.2[a]	7.2	7.3	29.8[a]	5200[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	-	-
Lead	15	-	158[a]	104[a]	55.8[a]	56.0[a]	14.0	20.5[a]	37.9[a]	45.2[a]	11.4	11.1	91.1[a]	288[a]
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-11*	*VAS-11*	*VAS-11*	*VAS-11*	*VAS-11*	*VAS-11*	*VAS-11*	*VAS-11*	*VAS-11*	*VAS-11*	*VAS-11*	*VAS-11*
Sample ID:			*GW-38443-120808-DD-177*	*GW-38443-120808-DD-178*	*GW-38443-120808-DD-179*	*GW-38443-120908-DD-180*	*GW-38443-120908-DD-181*	*GW-38443-120908-DD-182*	*GW-38443-120908-DD-183*	*GW-38443-120908-DD-184*	*GW-38443-120908-DD-185*	*GW-38443-120908-DD-186*	*GW-38443-120908-DD-187*	*GW-38443-120908-DD-188*
Sample Date:			*12/8/2008*	*12/8/2008*	*12/8/2008*	*12/8/2008*	*12/8/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*
Sample Depth:			*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*
	USEPA Regional Screening Levels										*Duplicate*			
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	0.54 J	0.96 J	1.1	0.24 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1-Dichloroethane	-	2.4	2.9	4.8	4.7	0.74 J	0.48 J	0.53 J	0.54 J	0.37 J	0.41 J	0.32 J	0.48 J	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	0.54 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	3.0	1.1	0.76 J	0.26 J	0.23 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	3.9	2.8	2.8	0.41 J	0.25 J	1.0 U	0.22 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	0.33 J	0.30 J	0.41 J	0.24 J	0.26 J	0.18 J	0.21 J	0.16 J	0.18 J	0.18 J	0.12 J	0.18 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	0.24 J	1.0 U	0.22 J	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	3.7	3.2	2.5	0.41 J	0.33 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	1.9	1.4	1.5	1.2	1.0	0.38 J	1.3	0.36 J	0.50 J	0.51 J	0.97 J	1.4
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Trichloroethene	5	2	2.3	2.8	2.7	0.47 J	0.34 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Vinyl chloride	2	0.016	4.1[a]	5.0[a]	4.3[a]	0.29 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
2,4,5-Trichlorophenol	-	3700	-	-	-	5.0 U	-	-	-	-	-	-	-	9.2 U
2,4,6-Trichlorophenol	-	6.1	-	-	-	5.0 U	-	-	-	-	-	-	-	9.2 U
2,4-Dichlorophenol	-	110	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
2,4-Dimethylphenol	-	730	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
2,4-Dinitrophenol	-	73	-	-	-	5.0 U	-	-	-	-	-	-	-	9.2 U
2,4-Dinitrotoluene	-	0.22	-	-	-	5.0 U	-	-	-	-	-	-	-	9.2 U
2,6-Dinitrotoluene	-	37	-	-	-	5.0 U	-	-	-	-	-	-	-	9.2 U
2-Chloronaphthalene	-	2900	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
2-Chlorophenol	-	180	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
2-Methylnaphthalene	-	150	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
2-Methylphenol	-	1800	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
2-Nitroaniline	-	370	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
2-Nitrophenol	-	-	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
3,3'-Dichlorobenzidine	-	0.15	-	-	-	5.0 U	-	-	-	-	-	-	-	9.2 U
3-Nitroaniline	-	-	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	5.0 U	-	-	-	-	-	-	-	9.2 U
4-Bromophenyl phenyl ether	-	-	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
4-Chloro-3-methylphenol	-	3700	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			VAS-11	VAS-11	VAS-11	VAS-11	VAS-11	VAS-11	VAS-11	VAS-11	VAS-11	VAS-11	VAS-11	VAS-11
Sample ID:			GW-38443-120808-DD-177	GW-38443-120808-DD-178	GW-38443-120808-DD-179	GW-38443-120808-DD-180	GW-38443-120808-DD-181	GW-38443-120808-DD-182	GW-38443-120808-DD-183	GW-38443-120808-DD-184	GW-38443-120808-DD-185	GW-38443-120808-DD-186	GW-38443-120808-DD-187	GW-38443-120808-DD-188
Sample Date:			12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008	12/8/2008
Sample Depth:			32-37 ft BGS	37-42 ft BGS	42-47 ft BGS	57-62 ft BGS	62-67 ft BGS	67-72 ft BGS	72-77 ft BGS	77-82 ft BGS	77-82 ft BGS	82-87 ft BGS	87-92 ft BGS	92-97 ft BGS
	USEPA Regional Screening Levels										Duplicate			
Parameter	MCL a	Tap Water b												
4-Chloroaniline	-	0.34	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
Semi-Volatile (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
4-Methylphenol	-	180	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
4-Nitroaniline	-	3.4	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
4-Nitrophenol	-	-	-	-	-	5.0 U	-	-	-	-	-	-	-	9.2 U
Acenaphthene	-	2200	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Acenaphthylene	-	-	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Acetophenone	-	3700	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Anthracene	-	11000	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Atrazine	3	0.29	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Benzaldehyde	-	3700	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Benzo(a)anthracene	-	0.029	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Benzo(a)pyrene	0.2	0.0029	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Benzo(b)fluoranthene	-	0.029	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Benzo(g,h,i)perylene	-	-	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Benzo(k)fluoranthene	-	0.29	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
bis(2-Chloroethoxy)methane	-	110	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
bis(2-Chloroethyl)ether	-	0.012	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	2.0 U	-	-	-	-	-	-	-	3.7 U
Butyl benzylphthalate (BBP)	-	35	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Caprolactam	-	18000	-	-	-	5.0 UJ	-	-	-	-	-	-	-	9.2 U
Carbazole	-	-	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Chrysene	-	2.9	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Dibenz(a,h)anthracene	-	0.0029	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Dibenzofuran	-	37	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Diethyl phthalate	-	29000	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Dimethyl phthalate	-	-	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Di-n-butylphthalate (DBP)	-	3700	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Fluoranthene	-	1500	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Fluorene	-	1500	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Hexachlorobenzene	1	0.042	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Hexachlorobutadiene	-	0.86	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Hexachlorocyclopentadiene	50	220	-	-	-	10 U	-	-	-	-	-	-	-	18 U
Hexachloroethane	-	4.8	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Isophorone	-	71	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Naphthalene	-	0.14	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Nitrobenzene	-	0.12	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
N-Nitrosodiphenylamine	-	14	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Pentachlorophenol	1	0.56	-	-	-	5.0 U	-	-	-	-	-	-	-	9.2 U
Phenanthrene	-	-	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Phenol	-	11000	-	-	-	1.0 U	-	-	-	-	-	-	-	1.8 U
Pyrene	-	1100	-	-	-	0.20 U	-	-	-	-	-	-	-	0.37 U
Metals														
Arsenic	10	0.045	750[a]	1740[a]	1120[a]	1030[a]	604[a]	271[a]	226[a]	211[a]	234[a]	103[a]	732[a]	157[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	12.2[a]	-	-	-	-	-	1.3 J
Lead	15	-	91.2[a]	192[a]	98.8[a]	275[a]	136[a]	97.9[a]	69.0[a]	124[a]	122[a]	54.6[a]	320[a]	76.7[a]
Lead (dissolved)	15	-	-	-	-	-	-	4.0	-	-	-	-	-	1.0 U

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*
Sample ID:			*GW-38443-111008-KMV-014*	*GW-38443-111008-KMV-015*	*GW-38443-111008-KMV-016*	*GW-38443-111008-KMV-017*	*GW-38443-111008-KMV-018*	*GW-38443-111008-KMV-019*	*GW-38443-111108-KMV-020*	*GW-38443-111108-KMV-021*	*GW-38443-111108-KMV-022*	*GW-38443-111108-KMV-023*	*GW-38443-111208-KMV-024*	*GW-38443-111208-KMV-025*
Sample Date:			*11/10/2008*	*11/10/2008*	*11/10/2008*	*11/10/2008*	*11/10/2008*	*11/10/2008*	*11/11/2008*	*11/11/2008*	*11/11/2008*	*11/11/2008*	*11/12/2008*	*11/12/2008*
Sample Depth:			*20-25 ft BGS*	*20-25 ft BGS*	*25-30 ft BGS*	*30-35 ft BGS*	*35-40 ft BGS*	*40-45 ft BGS*	*45-50 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*
	USEPA Regional Screening Levels			*Duplicate*										
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	0.24 J	0.23 J	0.39 J	0.37 J	0.63 J	0.49 J	1.1	1.1	0.38 J	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	0.35 J	0.33 J	0.34 J	0.36 J	0.55 J	0.64 J	0.60 J	0.43 J	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	19	18	0.72 J	10 U	0.57 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Acetone	-	22000	5.9 J	7.2 J	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Benzene	5	0.41	0.41 J	0.39 J	1.0 U	1.0 U	0.46 J	0.25 J	0.22 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Bromomethane (Methyl bromide)	-	8.7	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.0 U	0.21 J	0.46 J	0.47 J	0.72 J	0.66 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	1.0 UJ	1.0 UJ	0.13 J	0.12 J	0.31 J	0.18 J	0.14 J	1.0 UJ	0.13 J	1.0 UJ	1.0 UJ	1.0 UJ
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	1.0 U	1.0 U	1.0 U	1.0 U	0.33 J	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	0.54 J	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Methyl tert butyl ether (MTBE)	-	12	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	0.31 J	1.0 U	0.29 J	0.29 J	0.33 J	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	0.54 J	0.53 J	0.40 J	0.36 J	1.1	0.53 J	0.48 J	0.29 J	0.30 J	0.33 J	0.17 J	1.0 U
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Trichloroethene	5	2	2.1	2.1	4.0	4.4	5.7[a]	6.0[a]	5.6[a]	5.7[a]	1.4	2.1	1.0 U	0.45 J
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	2.0 U	0.58 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 UJ
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	1.0 U	1.0 U	1.0 U	-	-	-	-	-	1.0 UJ	-	-
2,4,5-Trichlorophenol	-	3700	5.0 U	5.0 U	5.0 U	-	-	-	-	-	5.0 U	-	-
2,4,6-Trichlorophenol	-	6.1	5.0 U	5.0 U	5.0 U	-	-	-	-	-	5.0 U	-	-
2,4-Dichlorophenol	-	110	2.0 U	2.0 U	2.0 U	-	-	-	-	-	2.0 U	-	-
2,4-Dimethylphenol	-	730	2.0 U	2.0 U	2.0 U	-	-	-	-	-	2.0 U	-	-
2,4-Dinitrophenol	-	73	5.0 U	5.0 U	5.0 U	-	-	-	-	-	5.0 U	-	-
2,4-Dinitrotoluene	-	0.22	5.0 U	5.0 U	5.0 U	-	-	-	-	-	5.0 U	-	-
2,6-Dinitrotoluene	-	37	5.0 U	5.0 U	5.0 U	-	-	-	-	-	5.0 U	-	-
2-Chloronaphthalene	-	2900	1.0 U	1.0 U	1.0 U	-	-	-	-	-	1.0 U	-	-
2-Chlorophenol	-	180	1.0 U	1.0 U	1.0 U	-	-	-	-	-	1.0 U	-	-
2-Methylnaphthalene	-	150	0.20 U	0.20 U	0.20 U	-	-	-	-	-	0.20 U	-	-
2-Methylphenol	-	1800	1.0 U	1.0 U	1.0 U	-	-	-	-	-	1.0 U	-	-
2-Nitroaniline	-	370	2.0 U	2.0 U	2.0 U	-	-	-	-	-	2.0 U	-	-
2-Nitrophenol	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	2.0 U	-	-
3,3'-Dichlorobenzidine	-	0.15	5.0 U	5.0 U	5.0 U	-	-	-	-	-	5.0 U	-	-
3-Nitroaniline	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	2.0 U	-	-
4,6-Dinitro-2-methylphenol	-	3.7	5.0 U	5.0 U	5.0 U	-	-	-	-	-	5.0 U	-	-
4-Bromophenyl phenyl ether	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	2.0 U	-	-
4-Chloro-3-methylphenol	-	3700	2.0 U	2.0 U	2.0 U	-	-	-	-	-	2.0 U	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*
Sample ID:			*GW-38443-111008-KMV-014*	*GW-38443-111008-KMV-015*	*GW-38443-111008-KMV-016*	*GW-38443-111008-KMV-017*	*GW-38443-111008-KMV-018*	*GW-38443-111008-KMV-019*	*GW-38443-111108-KMV-020*	*GW-38443-111108-KMV-021*	*GW-38443-111108-KMV-022*	*GW-38443-111108-KMV-023*	*GW-38443-111208-KMV-024*	*GW-38443-111208-KMV-025*
Sample Date:			*11/10/2008*	*11/10/2008*	*11/10/2008*	*11/10/2008*	*11/10/2008*	*11/10/2008*	*11/11/2008*	*11/11/2008*	*11/11/2008*	*11/11/2008*	*11/12/2008*	*11/12/2008*
Sample Depth:			*20-25 ft BGS*	*20-25 ft BGS*	*25-30 ft BGS*	*30-35 ft BGS*	*35-40 ft BGS*	*40-45 ft BGS*	*45-50 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*
	USEPA Regional Screening Levels			*Duplicate*										
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	2.0 U	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	2.0 U	-	-
4-Methylphenol	-	180	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
4-Nitroaniline	-	3.4	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	2.0 U	-	-
4-Nitrophenol	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	5.0 U	-	-
Acenaphthene	-	2200	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Acenaphthylene	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Acetophenone	-	3700	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Anthracene	-	11000	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Atrazine	3	0.29	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Benzaldehyde	-	3700	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Benzo(a)anthracene	-	0.029	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Benzo(a)pyrene	0.2	0.0029	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Benzo(b)fluoranthene	-	0.029	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Benzo(g,h,i)perylene	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Benzo(k)fluoranthene	-	0.29	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Biphenyl (1,1-Biphenyl)	-	1800	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
bis(2-Chloroethoxy)methane	-	110	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
bis(2-Chloroethyl)ether	-	0.012	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	6.8 U	2.0 U	2.0 U	-	-	-	-	-	-	2.0 U	-	-
Butyl benzylphthalate (BBP)	-	35	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Caprolactam	-	18000	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	5.0 U	-	-
Carbazole	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Chrysene	-	2.9	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Dibenz(a,h)anthracene	-	0.0029	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Dibenzofuran	-	37	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Diethyl phthalate	-	29000	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Dimethyl phthalate	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Di-n-butylphthalate (DBP)	-	3700	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Di-n-octyl phthalate (DnOP)	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Fluoranthene	-	1500	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Fluorene	-	1500	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Hexachlorobenzene	1	0.042	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Hexachlorobutadiene	-	0.86	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Hexachlorocyclopentadiene	50	220	10 U	10 U	10 U	-	-	-	-	-	-	10 UJ	-	-
Hexachloroethane	-	4.8	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Isophorone	-	71	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Naphthalene	-	0.14	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Nitrobenzene	-	0.12	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
N-Nitrosodi-n-propylamine	-	0.0096	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
N-Nitrosodiphenylamine	-	14	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Pentachlorophenol	1	0.56	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	5.0 U	-	-
Phenanthrene	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Phenol	-	11000	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	1.0 U	-	-
Pyrene	-	1100	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	0.20 U	-	-
Metals														
Arsenic	10	0.045	1.6 J	1.8 J	9.0 J	3.5 J	92.2 J[a]	23.9 J[a]	59.1 J[a]	37.0 J[a]	70.8 J[a]	171 J[a]	33.0 J[a]	25.0 J[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	-	-
Lead	15	-	0.73 J	0.76 J	6.8	2.5	26.8[a]	8.1	10.8	6.5	20.6[a]	126[a]	14.3	10
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-12*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*
Sample ID:			*GW-38443-111208-KMV-026*	*GW-38443-111208-KMV-027*	*GW-38443-111308-KMV-028*	*GW-38443-111308-KMV-029*	*GW-38443-111408-KMV-030*	*GW-38443-120108-DD-144*	*GW-38443-120208-DD-145*	*GW-38443-120208-DD-146*	*GW-38443-120208-DD-147*	*GW-38443-120208-DD-148*	*GW-38443-120208-DD-149*	*GW-38443-120208-DD-150*
Sample Date:			*11/12/2008*	*11/12/2008*	*11/13/2008*	*11/13/2008*	*11/14/2008*	*12/1/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*
Sample Depth:			*75-80 ft BGS*	*80-85 ft BGS*	*85-90 ft BGS*	*90-95 ft BGS*	*95-100 ft BGS*	*12-17 ft BGS*	*17-22 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL*	*TapWater*												
	a	*b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 UJ	10 UJ	10 UJ	50 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	10 UJ	10 UJ	10 U	10 U	10 U	50 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	0.23 J	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	5.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	-	13000	0.14 J	1.0 UJ	1.0 U	1.0 U	0.16 J	5.0 U	0.13 J	1.0 U	0.27 J	0.14 J	1.0 U	1.0 U
Dibromochloromethane	-	0.15	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	0.30 J	1.0 U	1.0 U	1.0 U	0.28 J	180	1.4	1.7	1.5	1.1	0.49 J	0.35 J
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 UJ	2.0 UJ	2.0 UJ	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-	5.0 UJ	5.0 U	5.0 U	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
2-Chlorophenol	-	180	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
2-Methylphenol	-	1800	-	-	-	-	1.0 U	1.0 UJ	1.0 UJ	-	-	-	-	-
2-Nitroaniline	-	370	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			VAS-12	VAS-12	VAS-12	VAS-12	VAS-12	VAS-13	VAS-13	VAS-13	VAS-13	VAS-13	VAS-13	VAS-13
Sample ID:			GW-38443-111208-KMV-026	GW-38443-111208-KMV-027	GW-38443-111308-KMV-028	GW-38443-111308-KMV-029	GW-38443-111408-KMV-030	GW-38443-120108-DD-144	GW-38443-120208-DD-145	GW-38443-120208-DD-146	GW-38443-120208-DD-147	GW-38443-120208-DD-148	GW-38443-120208-DD-149	GW-38443-120208-DD-150
Sample Date:			11/12/2008	11/12/2008	11/13/2008	11/13/2008	11/14/2008	12/1/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008	12/2/2008
Sample Depth:			75-80 ft BGS	80-85 ft BGS	85-90 ft BGS	90-95 ft BGS	95-100 ft BGS	12-17 ft BGS	17-22 ft BGS	22-27 ft BGS	27-32 ft BGS	32-37 ft BGS	37-42 ft BGS	42-47 ft BGS
	USEPA Regional Screening Levels													
Parameter	MCL a	TapWater b												
4-Chloroaniline	-	0.34	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Acetophenone	-	3700	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Anthracene	-	11000	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Atrazine	3	0.29	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Benzaldehyde	-	3700	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	1.0 U	1.0 UJ	1.0 UJ	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	2.5 U	0.89 J	2.0 U	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Caprolactam	-	18000	-	-	-	-	5.0 U	5.0 UJ	5.0 UJ	-	-	-	-	-
Carbazole	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Chrysene	-	2.9	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Dibenzofuran	-	37	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Fluorene	-	1500	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-	10 U	10 UJ	10 UJ	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Isophorone	-	71	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Naphthalene	-	0.14	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Phenol	-	11000	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-
Pyrene	-	1100	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-
Metals														
Arsenic	10	0.045	27.9 J[a]	6.8 J	3.4 J	3.4 J	12.1[a]	43.6[a]	165[a]	101[a]	93.6[a]	32.2[a]	5.7	6.3
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	-	-
Lead	15	-	44.4[a]	6.3	1.0	0.35 J	13.2	40.8[a]	33.8[a]	17.8[a]	37.5[a]	12.7	1.8	2.3
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*
Sample ID:			*GW-38443-120208-DD-151*	*GW-38443-120208-DD-152*	*GW-38443-120308-DD-153*	*GW-38443-120308-DD-154*	*GW-38443-120308-DD-155*	*GW-38443-120308-DD-156*	*GW-38443-120308-DD-157*	*GW-38443-120308-DD-158*	*GW-38443-111608-KMV-032*	*GW-38443-111608-KMV-033*	*GW-38443-111608-KMV-034*	*GW-38443-111608-KMV-035*
Sample Date:			*12/2/2008*	*12/2/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*11/16/2008*	*11/16/2008*	*11/16/2008*	*11/16/2008*
Sample Depth:			*47-52 ft BGS*	*52-57 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*25-30 ft BGS*	*30-35 ft BGS*	*35-40 ft BGS*	*40-45 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.26 J	0.24 J	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 UJ	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	0.61 J	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U
Acetone	-	22000	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.31 J	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.76 J	0.67 J	0.28 J	0.22 J
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.0 U	0.21 J	1.0 U	1.0 U	1.0 U	1.0 U	0.24 J	1.0 U	1.1	0.96 J	2.1	1.8
cis-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	0.16 J	1.0 U	0.17 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	0.30 J	0.14 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U
Ethylbenzene	700	1.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	0.22 J	1.0 UJ
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.39 J	0.46 J	1.0 U	1.0 U
Toluene	1000	2300	2.3	1.5	0.57 J	0.43 J	0.44 J	0.45 J	0.46 J	0.30 J	0.22 J	0.17 J	0.76 J	0.37 J
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.25 J	0.20 J	0.21 J	0.20 J
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.91 J	0.85 J	1.2	0.87 J
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 UJ	2.0 UJ	0.50 J	2.0 UJ
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
2,4,5-Trichlorophenol	-	3700	-	-	5.0 U	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	5.0 U	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-
2,4-Dichlorophenol	-	110	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
2,4-Dimethylphenol	-	730	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
2,4-Dinitrophenol	-	73	-	-	5.0 U	-	-	-	-	5.0 U	5.0 UJ	5.0 UJ	-	-
2,4-Dinitrotoluene	-	0.22	-	-	5.0 U	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-
2,6-Dinitrotoluene	-	37	-	-	5.0 U	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-
2-Chloronaphthalene	-	2900	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
2-Chlorophenol	-	180	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
2-Methylnaphthalene	-	150	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
2-Methylphenol	-	1800	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
2-Nitroaniline	-	370	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
2-Nitrophenol	-	-	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	5.0 U	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-
3-Nitroaniline	-	-	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	5.0 U	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-
4-Bromophenyl phenyl ether	-	-	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
4-Chloro-3-methylphenol	-	3700	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-13*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*
Sample ID:			*GW-38443-120208-DD-151*	*GW-38443-120208-DD-152*	*GW-38443-120308-DD-153*	*GW-38443-120308-DD-154*	*GW-38443-120308-DD-155*	*GW-38443-120308-DD-156*	*GW-38443-120308-DD-157*	*GW-38443-120308-DD-158*	*GW-38443-111608-KMV-032*	*GW-38443-111608-KMV-033*	*GW-38443-111608-KMV-034*	*GW-38443-111608-KMV-035*
Sample Date:			*12/2/2008*	*12/2/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*12/3/2008*	*11/16/2008*	*11/16/2008*	*11/16/2008*	*11/16/2008*
Sample Depth:			*47-52 ft BGS*	*52-57 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*25-30 ft BGS*	*30-35 ft BGS*	*35-40 ft BGS*	*40-45 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
Semi-Volatile (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
4-Methylphenol	-	180	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
4-Nitroaniline	-	3.4	-	-	2.0 U	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
4-Nitrophenol	-	-	-	-	5.0 U	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-
Acenaphthene	-	2200	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Acenaphthylene	-	-	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Acetophenone	-	3700	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Anthracene	-	11000	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Atrazine	3	0.29	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Benzaldehyde	-	3700	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Benzo(a)anthracene	-	0.029	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Benzo(b)fluoranthene	-	0.029	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Benzo(g,h,i)perylene	-	-	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Benzo(k)fluoranthene	-	0.29	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	1.1 J	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Caprolactam	-	18000	-	-	5.0 U	-	-	-	-	5.0 U	5.0 UJ	5.0 UJ	-	-
Carbazole	-	-	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Chrysene	-	2.9	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Dibenzofuran	-	37	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Diethyl phthalate	-	29000	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Dimethyl phthalate	-	-	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Fluoranthene	-	1500	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Fluorene	-	1500	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Hexachlorobenzene	1	0.042	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Hexachlorobutadiene	-	0.86	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Hexachlorocyclopentadiene	50	220	-	-	10 U	-	-	-	-	10 U	10 U	10 U	-	-
Hexachloroethane	-	4.8	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Isophorone	-	71	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Naphthalene	-	0.14	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Nitrobenzene	-	0.12	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
N-Nitrosodiphenylamine	-	14	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Pentachlorophenol	1	0.56	-	-	5.0 U	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-
Phenanthrene	-	-	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Phenol	-	11000	-	-	1.0 U	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-
Pyrene	-	1100	-	-	0.20 U	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-
Metals														
Arsenic	10	0.045	35.6[a]	25.8[a]	20.3[a]	17.1[a]	16.5[a]	13.1[a]	17.4[a]	12.5[a]	18.1[a]	5.8	145[a]	89.0[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	-	-
Lead	15	-	31.9[a]	23.0[a]	19.3[a]	14.1	12.3	8.3	13.2	6.6	26.6[a]	18.6[a]	252[a]	154[a]
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-14*	*VAS-15*
Sample ID:			*GW-38443-111608-KMV-036*	*GW-38443-111608-KMV-037*	*GW-38443-111608-KMV-038*	*GW-38443-111708-KMV-039*	*GW-38443-111708-KMV-040*	*GW-38443-111708-KMV-041*	*GW-38443-111808-KMV-042*	*GW-38443-111808-KMV-043*	*GW-38443-111808-KMV-044*	*GW-38443-111808-KMV-045*	*GW-38443-111908-KMV-046*	*GW-38443-120908-KMV-073*
Sample Date:			*11/16/2008*	*11/16/2008*	*11/16/2008*	*11/17/2008*	*11/17/2008*	*11/17/2008*	*11/18/2008*	*11/18/2008*	*11/18/2008*	*11/18/2008*	*11/19/2008*	*12/9/2008*
Sample Depth:			*40-45 ft BGS*	*45-50 ft BGS*	*50-55 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*	*75-80 ft BGS*	*80-85 ft BGS*	*85-90 ft BGS*	*90-95 ft BGS*	*95-100 ft BGS*	*30-35 ft BGS*
	USEPA Regional Screening Levels		*Duplicate*											
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	1.0 UJ	1.0 UJ	11 UJ	8.0 UJ	8.0 UJ	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 UJ
1,1-Dichloroethane	-	2.4	1.0 U	0.26 J	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	2.4	2.5	2.3	2.3	0.59 J	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	2.0 U	2.0 U	22 U	16 U	16 U	3.3 U	3.3 UJ	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 UJ
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	110 U	80 U	80 U	17 U	17 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	110 U	80 U	80 U	17 U	17 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	110 U	80 U	80 U	17 U	17 U	10 U	10 U	10 U	10 U
Acetone	-	22000	10 U	10 U	10 U	110 U	80 U	80 U	17 U	17 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	0.44 J	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	0.30 J	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 UJ	1.7 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 UJ	1.0 UJ	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	0.22 J	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	0.78 J
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	2.0	9.9	5.1	390[a]	290[a]	270[a]	130 J[a]	120 J[a]	74 J[a]	75 J[a]	28	2.2
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	11 UJ	8.0 UJ	8.0 UJ	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 UJ
Cyclohexane	-	13000	1.0 UJ	0.35 J	1.0 UJ	11 UJ	8.0 UJ	8.0 UJ	1.7 U	1.7 U	1.0 U	1.0 U	0.22 J	0.14 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 UJ	1.7 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ
Ethylbenzene	700	1.5	1.0 UJ	0.23 J	1.0 UJ	11 UJ	8.0 UJ	8.0 UJ	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 UJ
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	110 U	80 U	80 U	17 U	17 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 UJ	1.0 UJ	1.0 UJ	11 UJ	8.0 UJ	8.0 UJ	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 UJ	5.0 UJ	5.0 U	56 U	40 U	40 U	8.4 U	8.4 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 UJ	1.0 UJ	1.0 U	25 U	19 U	15 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 UJ	1.7 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U
Toluene	1000	2300	0.40 J	0.97 J	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	0.17 J	1.0 U	0.41 J	0.25 J
trans-1,2-Dichloroethene	100	110	0.20 J	0.53 J	0.43 J	3.2 J	2.3 J	1.7 J	0.86 J	0.52 J	0.49 J	0.40 J	0.39 J	0.25 J
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	11 UJ	8.0 UJ	8.0 UJ	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 UJ
Trichloroethene	5	2	0.85 J	2.6	3.0	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	16[a]
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	11 U	8.0 U	8.0 U	1.7 U	1.7 U	1.0 U	1.0 U	1.0 U	1.0 UJ
Vinyl chloride	2	0.016	1.0 U	1.0 U	0.27 J	120[a]	50[a]	50[a]	28[a]	28 J[a]	13[a]	14[a]	2.1[a]	1.0 U
Xylene (total)	10000	200	2.0 UJ	0.48 J	2.0 UJ	22 UJ	16 UJ	16 UJ	3.3 U	3.3 U	2.0 U	2.0 U	2.0 U	2.0 UJ
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
2,4-Dichlorophenol	-	110	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
2,4-Dimethylphenol	-	730	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
2,4-Dinitrophenol	-	73	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
2,6-Dinitrotoluene	-	37	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
2-Chloronaphthalene	-	2900	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
2-Chlorophenol	-	180	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
2-Methylnaphthalene	-	150	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
2-Methylphenol	-	1800	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
2-Nitroaniline	-	370	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
2-Nitrophenol	-	-	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
3,3'-Dichlorobenzidine	-	0.15	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
3-Nitroaniline	-	-	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:	USEPA Regional Screening Levels		VAS-14	VAS-14	VAS-14	VAS-14	VAS-14	VAS-14	VAS-14	VAS-14	VAS-14	VAS-14	VAS-14	VAS-15
Sample ID:			GW-38443-111608-KMV-036	GW-38443-111608-KMV-037	GW-38443-111608-KMV-038	GW-38443-111708-KMV-039	GW-38443-111708-KMV-040	GW-38443-111708-KMV-041	GW-38443-111808-KMV-042	GW-38443-111808-KMV-043	GW-38443-111808-KMV-044	GW-38443-111808-KMV-045	GW-38443-111908-KMV-046	GW-38443-120908-KMV-073
Sample Date:			11/16/2008	11/16/2008	11/16/2008	11/17/2008	11/17/2008	11/17/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008	11/18/2008	12/9/2008
Sample Depth:			40-45 ft BGS	45-50 ft BGS	50-55 ft BGS	60-65 ft BGS	65-70 ft BGS	70-75 ft BGS	75-80 ft BGS	80-85 ft BGS	85-90 ft BGS	90-95 ft BGS	95-100 ft BGS	30-35 ft BGS
			Duplicate											
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
4-Methylphenol	-	180	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
4-Nitroaniline	-	3.4	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
4-Nitrophenol	-	-	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
Acenaphthene	-	2200	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Acenaphthylene	-	-	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Acetophenone	-	3700	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Anthracene	-	11000	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Atrazine	3	0.29	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Benzaldehyde	-	3700	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Benzo(a)anthracene	-	0.029	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	-	2.0 U	-	-	-	2.0 U	2.0 U
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	-	1.0 U	-	-	-	0.95 J	1.0 U
Caprolactam	-	18000	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
Carbazole	-	-	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Chrysene	-	2.9	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Dibenzofuran	-	37	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Diethyl phthalate	-	29000	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Dimethyl phthalate	-	-	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Fluoranthene	-	1500	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Fluorene	-	1500	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Hexachlorobenzene	1	0.042	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Hexachlorobutadiene	-	0.86	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	-	10 UJ	-	-	-	10 U	10 U
Hexachloroethane	-	4.8	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Isophorone	-	71	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Naphthalene	-	0.14	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Nitrobenzene	-	0.12	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Pentachlorophenol	1	0.56	-	-	-	-	-	-	5.0 U	-	-	-	5.0 U	5.0 U
Phenanthrene	-	-	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Phenol	-	11000	-	-	-	-	-	-	1.0 U	-	-	-	1.0 U	1.0 U
Pyrene	-	1100	-	-	-	-	-	-	0.20 U	-	-	-	0.20 U	0.20 U
Metals														
Arsenic	10	0.045	97.0[a]	98.6[a]	10.9[a]	56.0[a]	11.8[a]	6.7	7.8	6.2	7.6	5.4	18.2[a]	10.9[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	-	0.66 J
Lead	15	-	169[a]	145[a]	14.1	93.9[a]	9.0	1.7	9.4	0.32 J	10.8	4.1	40.8[a]	6.3
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	-	0.20 J

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*
Sample ID:			*GW-38443-120908-KMV-074*	*GW-38443-120908-KMV-075*	*GW-38443-120908-KMV-076*	*GW-38443-120908-KMV-077*	*GW-38443-120908-KMV-078*	*GW-38443-120908-KMV-079*	*GW-38443-120908-KMV-080*	*GW-38443-120908-KMV-081*	*GW-38443-120908-KMV-082*	*GW-38443-120908-KMV-083*	*GW-38443-121008-KMV-084*	*GW-38443-121008-KMV-085*
Sample Date:			*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/10/2008*	*12/10/2008*
Sample Depth:			*35-40 ft BGS*	*40-45 ft BGS*	*45-50 ft BGS*	*45-50 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*	*75-80 ft BGS*	*80-85 ft BGS*	*85-90 ft BGS*
	USEPA Regional Screening Levels					*Duplicate*								
Parameter	*MCL*	*TapWater*												
	a	*b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethene	-	0.067	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.50 J	0.50 J	0.67 J	0.66 J
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	0.75 J	0.30 J	0.24 J	0.23 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	2.0	5.4	7.9	7.8	30	33	13	12	9.8	9.9	28 J	24
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	1.0 U	0.34 J	0.46 J	0.45 J	0.39 J	0.42 J	0.55 J	0.57 J	0.47 J	0.42 J	0.30 J	0.27 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	1.0 UJ	1.0 UJ	0.20 J	0.20 J	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Toluene	1000	2300	0.17 J	0.54 J	0.71 J	0.64 J	0.38 J	0.44 J	0.38 J	0.46 J	0.45 J	0.41 J	0.49 J	0.27 J
trans-1,2-Dichloroethene	100	110	0.25 J	0.38 J	0.42 J	0.38 J	0.43 J	0.49 J	1.0 U	1.0 U	1.0 U	1.0 U	0.24 J	0.21 J
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Trichloroethene	5	2	13[a]	18[a]	16[a]	16[a]	2.9	2.4	2.7	1.7	2.1	2.5	3.5	1.6
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.5	1.4	29[a]	24[a]	30[a]	29[a]	16[a]	15[a]	27 J[a]	28[a]
Xylene (total)	10000	200	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ	2.0 UJ
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	1.0 U	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	5.0 U	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	5.0 U	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	2.0 U	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	2.0 U	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	5.0 U	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	5.0 U	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	5.0 U	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	1.0 U	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	1.0 U	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	0.20 U	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	1.0 U	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	2.0 U	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	2.0 U	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	5.0 U	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	2.0 U	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	5.0 U	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	2.0 U	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	2.0 U	-	-	-	-	-	-	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*	*VAS-15*
Sample ID:			*GW-38443-120908-KMV-074*	*GW-38443-120908-KMV-075*	*GW-38443-120908-KMV-076*	*GW-38443-120908-KMV-077*	*GW-38443-120908-KMV-078*	*GW-38443-120908-KMV-079*	*GW-38443-120908-KMV-080*	*GW-38443-120908-KMV-081*	*GW-38443-120908-KMV-082*	*GW-38443-120908-KMV-083*	*GW-38443-121008-KMV-084*	*GW-38443-121008-KMV-085*
Sample Date:			*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/9/2008*	*12/10/2008*	*12/10/2008*
Sample Depth:			*35-40 ft BGS*	*40-45 ft BGS*	*45-50 ft BGS*	*45-50 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*	*75-80 ft BGS*	*80-85 ft BGS*	*85-90 ft BGS*
	USEPA Regional Screening Levels					*Duplicate*								
Parameter	*MCL* a	*TapWater* b												
4-Chloroaniline	-	0.34	-	2.0 U	-	-	-	-	-	-	-	-	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	2.0 U	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	1.0 U	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	2.0 U	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	5.0 U	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	3700	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11000	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Atrazine	3	0.29	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	1.0 U	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	1.0 U	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	1.0 U	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	2.0 U	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Caprolactam	-	18000	-	5.0 U	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Chrysene	-	2.9	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1500	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	10 U	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Isophorone	-	71	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	1.0 U	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	1.0 U	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	5.0 U	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Phenol	-	11000	-	1.0 U	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1100	-	0.20 U	-	-	-	-	-	-	-	-	-	-
Metals														
Arsenic	10	0.045	5.9	97.7[a]	59.8[a]	48.6[a]	62.9[a]	54.0[a]	61.3[a]	40.3[a]	53.6[a]	56.8[a]	88.8[a]	37.5[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	2.0 J	-	-	-
Lead	15	-	4.2	92.2[a]	44.3[a]	37.7[a]	142[a]	62.2[a]	110[a]	65.6[a]	86.9[a]	92.7[a]	152[a]	21.9[a]
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	1.3	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-15*	*VAS-15*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*
Sample ID:			*GW-38443-121008-KMV-086*	*GW-38443-121008-KMV-087*	*GW-38443-112008-KMV-047*	*GW-38443-112008-KMV-048*	*GW-38443-120108-KMV-049*	*GW-38443-120108-KMV-050*	*GW-38443-120108-KMV-051*	*GW-38443-120208-KMV-052*	*GW-38443-120208-KMV-053*	*GW-38443-120208-KMV-054*	*GW-38443-120208-KMV-055*	*GW-38443-120308-KMV-056*
Sample Date:			*12/10/2008*	*12/10/2008*	*11/20/2008*	*11/20/2008*	*12/1/2008*	*12/1/2008*	*12/1/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*
Sample Depth:			*90-95 ft BGS*	*95-100 ft BGS*	*30-35 ft BGS*	*35-40 ft BGS*	*45-50 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*	*75-80 ft BGS*	*80-85 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	5.0 UJ	5.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	5.0 U	5.0 U	0.55 J	0.60 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.54 J
1,1-Dichloroethene	7	340	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	10 U	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	5.0 UJ	5.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	50 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	50 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	50 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	50 U	50 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U
Benzene	5	0.41	5.0 U	5.0 U	0.75 J	0.65 J	0.27 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	5.0 U	5.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Bromomethane (Methyl bromide)	-	8.7	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	5.0 U	5.0 U	5.9	6.0	0.20 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	5.0 U	5.0 U	0.64 J	0.52 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	130[a]	150[a]	0.26 J	0.23 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	5.0 UJ	5.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	-	13000	5.0 U	5.0 U	0.34 J	0.21 J	0.23 J	1.0 U	1.0 U	0.17 J	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	-	0.15	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	5.0 UJ	5.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	5.0 UJ	5.0 UJ	0.20 J	0.20 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	50 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	25 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	0.20 J
Methylene chloride	5	4.8	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	5.0 U	5.0 U	0.82 J	0.61 J	0.50 J	1.0 U	1.0 U	0.34 J	1.0 U	0.17 J	1.0 U	0.19 J
trans-1,2-Dichloroethene	100	110	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	5.0 UJ	5.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ
Trichloroethene	5	2	6.9[a]	8.9[a]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	5.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	28[a]	27[a]	0.71 J	0.85 J	0.22 J	0.95 J	1.0	1.8	1.9	2.6[a]	2.5[a]	3.0[a]
Xylene (total)	10000	200	10 UJ	10 UJ	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	5.0 U	5.0 U	5.0 U	-	5.0 U	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	5.0 U	5.0 U	5.0 U	-	5.0 U	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	5.0 U	5.0 U	5.0 U	-	5.0 U	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	5.0 U	5.0 U	5.0 U	-	5.0 U	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	5.0 U	5.0 U	5.0 U	-	5.0 U	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
2-Chlorophenol	-	180	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
2-Methylphenol	-	1800	-	1.0 U	1.0 U	1.0 U	-	1.0 UJ	-	-	-	-	-	-
2-Nitroaniline	-	370	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-
2-Nitrophenol	-	-	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	5.0 U	5.0 U	5.0 U	-	5.0 U	-	-	-	-	-	-
3-Nitroaniline	-	-	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	5.0 U	5.0 U	5.0 U	-	5.0 U	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-15*	*VAS-15*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*	*VAS-17*
Sample ID:			*GW-38443-121008-KMV-086*	*GW-38443-121008-KMV-087*	*GW-38443-112008-KMV-047*	*GW-38443-112008-KMV-048*	*GW-38443-120108-KMV-049*	*GW-38443-120108-KMV-050*	*GW-38443-120108-KMV-051*	*GW-38443-120208-KMV-052*	*GW-38443-120208-KMV-053*	*GW-38443-120208-KMV-054*	*GW-38443-120208-KMV-055*	*GW-38443-120308-KMV-056*
Sample Date:			*12/10/2008*	*12/10/2008*	*11/20/2008*	*11/20/2008*	*12/1/2008*	*12/1/2008*	*12/1/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/3/2008*
Sample Depth:			*90-95 ft BGS*	*95-100 ft BGS*	*30-35 ft BGS*	*35-40 ft BGS*	*45-50 ft BGS*	*50-55 ft BGS*	*55-60 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*	*75-80 ft BGS*	*80-85 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-
4-Methylphenol	-	180	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	2.0 U	2.0 U	2.0 U	-	2.0 U	-	-	-	-	-	-
4-Nitrophenol	-	-	-	5.0 U	5.0 U	5.0 U	-	5.0 U	-	-	-	-	-	-
Acenaphthene	-	2200	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Acenaphthylene	-	-	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Acetophenone	-	3700	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Anthracene	-	11000	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Atrazine	3	0.29	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Benzaldehyde	-	3700	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	0.20 U	0.20 U	0.56[a]	-	0.20 U	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	1.0 U	1.0 U	1.0 U	-	1.0 Uj	-	-	-	-	-	-
bis(2-Ethylhexyl)phthelate (DEHP)	6	4.8	-	2.0 U	2.0 U	2.0 U	-	3.0	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Caprolactam	-	18000	-	5.0 U	5.0 U	5.0 U	-	5.0 Uj	-	-	-	-	-	-
Carbazole	-	-	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Chrysene	-	2.9	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Dibenzofuran	-	37	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Fluoranthene	-	1500	-	0.20 U	0.20 U	0.35	-	0.20 U	-	-	-	-	-	-
Fluorene	-	1500	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	10 U	10 U	10 U	-	10 Uj	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Isophorone	-	71	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Naphthalene	-	0.14	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	5.0 U	5.0 U	5.0 U	-	5.0 U	-	-	-	-	-	-
Phenanthrene	-	-	-	0.20 U	0.20 U	0.20 U	-	0.20 U	-	-	-	-	-	-
Phenol	-	11000	-	1.0 U	1.0 U	1.0 U	-	1.0 U	-	-	-	-	-	-
Pyrene	-	1100	-	0.20 U	0.20 U	0.27	-	0.20 U	-	-	-	-	-	-
Metals														
Arsenic	10	0.045	56.3[a]	22.7[a]	85.2[a]	30.9[a]	35.4[a]	4.1 J	3.5 J	15.7[a]	5.9	10.9[a]	4.6 J	21.7[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	-	-
Lead	15	-	102[a]	36.4[a]	57.9[a]	26.4[a]	43.9[a]	2.2	1.0 U	21.4[a]	5.9	15.0	4.3	47.5[a]
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

Uj - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-17*	*VAS-17*	*VAS-17*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:			*GW-38443-120308-KMV-057*	*GW-38443-120408-KMV-058*	*GW-38443-120408-KMV-059*	*GW-38443-121508-DD-189*	*GW-38443-121508-DD-190*	*GW-38443-121508-DD-191*	*GW-38443-121508-DD-192*	*GW-38443-121508-DD-193*	*GW-38443-121608-DD-194*	*GW-38443-121608-DD-195*	*GW-38443-121608-DD-196*	*GW-38443-121608-DD-197*
Sample Date:			*12/3/2008*	*12/4/2008*	*12/4/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:			*85-90 ft BGS*	*90-95 ft BGS*	*95-100 ft BGS*	*17-22 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*	*67-52 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*
	USEPA Regional Screening Levels											*Duplicate*		
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,1-Dichloroethane	-	2.4	0.53 J	0.62 J	0.65 J	0.43 J	1.0 U	1.0 U	0.22 J	0.22 J	5.0 U	6.7 U	6.7 U	1.5 J
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	10 U	13 U	13 U	6.7 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U	67 U	67 U	33 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U	67 U	67 U	33 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U	67 U	67 U	33 U
Acetone	-	22000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U	67 U	67 U	33 U
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.9 J	5.2 J	5.1 J	31
cis-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 UJ	6.7 UJ	3.3 UJ
Cyclohexane	-	13000	1.0 U	1.0 U	0.13 J	0.14 J	0.20 J	0.18 J	0.20 J	0.17 J	5.0 U	6.7 U	6.7 U	3.3 U
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 UJ	6.7 UJ	3.3 UJ
Ethylbenzene	700	1.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U	67 U	67 U	33 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Methyl tert butyl ether (MTBE)	-	12	0.25 J	0.49 J	0.47 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	25 U	33 U	33 U	17 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Toluene	1000	2300	1.0 U	1.0 U	0.24 J	2.3	1.6	1.2	0.82 J	0.90 J	5.0 U	6.7 U	6.7 U	3.3 U
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U	6.7 U	6.7 U	3.3 U
Vinyl chloride	2	0.016	2.9[a]	3.7[a]	3.8[a]	0.27 J	0.91 J	0.68 J	60[a]	40[a]	140[a]	160[a]	150[a]	88[a]
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	10 U	13 U	13 U	6.7 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-17*	*VAS-17*	*VAS-17*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*
Sample ID:			*GW-38443-120308-KMV-057*	*GW-38443-120408-KMV-058*	*GW-38443-120408-KMV-059*	*GW-38443-121508-DD-189*	*GW-38443-121508-DD-190*	*GW-38443-121508-DD-191*	*GW-38443-121508-DD-192*	*GW-38443-121508-DD-193*	*GW-38443-121608-DD-194*	*GW-38443-121608-DD-195*	*GW-38443-121608-DD-196*	*GW-38443-121608-DD-197*
Sample Date:			*12/3/2008*	*12/4/2008*	*12/4/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/15/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*
Sample Depth:			*85-90 ft BGS*	*90-95 ft BGS*	*95-100 ft BGS*	*17-22 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*
	USEPA Regional Screening Levels											*Duplicate*		
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-
Semi-Volatile (continued)														
4-Chlorophenyl phenyl ether	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	2.0 U	2.0 U	2.0 U	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	0.20 U	0.20 U	0.21	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	-
Acetophenone	-	3700	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Anthracene	-	11000	-	-	0.20 U	0.20 U	0.21	-	-	-	-	-	-	-
Atrazine	3	0.29	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	0.20 U	0.20 U	0.57	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	0.20 U	0.20 U	1.1[a]	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	0.20 U	0.20 U	1.1	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	0.20 U	0.20 U	0.29	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	0.20 U	0.20 U	0.33	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	1.7 J	2.0 U	2.0 U	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Caprolactam	-	18000	-	-	5.0 U	5.0 UJ	5.0 UJ	-	-	-	-	-	-	-
Carbazole	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Chrysene	-	2.9	-	-	0.20 U	0.20 U	0.55	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	0.20 U	0.20 U	1.1	-	-	-	-	-	-	-
Fluorene	-	1500	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	10 U	10 U	10 U	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	0.20 U	0.20 U	0.24	-	-	-	-	-	-	-
Isophorone	-	71	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	-	0.20 U	0.20 U	0.20 U	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	5.0 U	5.0 U	5.0 U	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	0.20 U	0.20 U	0.74	-	-	-	-	-	-	-
Phenol	-	11000	-	-	1.0 U	1.0 U	1.0 U	-	-	-	-	-	-	-
Pyrene	-	1100	-	-	0.20 U	0.20 U	0.91	-	-	-	-	-	-	-
Metals														
Arsenic	10	0.045	8.1	9.6	9.9	66.2[a]	49.0[a]	18.8[a]	53.6[a]	15.3[a]	19.6[a]	30.4[a]	20.2[a]	25.4[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	3.2 J	-	-	-	-	3.0 J
Lead	15	-	11.5	33.4[a]	24.4[a]	180[a]	226[a]	66.6[a]	162[a]	38.6[a]	49.4[a]	66.0[a]	49.7[a]	62.3[a]
Lead (dissolved)	15	-	-	-	-	-	-	-	1.0 U	-	-	-	-	1.0 U

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			VAS-19	VAS-19	VAS-19	VAS-19	VAS-19	VAS-19	VAS-19	VAS-20	VAS-20	VAS-20	VAS-20	VAS-20
Sample ID:			GW-38443-121608-DD-198	GW-38443-121608-DD-199	GW-38443-121608-DD-200	GW-38443-121608-DD-201	GW-38443-121608-DD-202	GW-38443-121608-DD-203	GW-38443-121608-DD-204	GW-38443-011109-KMV-229	GW-38443-011109-KMV-230	GW-38443-011109-KMV-231	GW-38443-011109-KMV-232	GW-38443-011109-KMV-233
Sample Date:			12/16/2008	12/16/2008	12/16/2008	12/16/2008	12/16/2008	12/16/2008	12/16/2008	1/11/2009	1/11/2009	1/11/2009	1/11/2009	1/11/2009
Sample Depth:			62-67 ft BGS	67-72 ft BGS	72-77 ft BGS	77-82 ft BGS	82-87 ft BGS	87-92 ft BGS	92-97 ft BGS	22-27 ft BGS	27-32 ft BGS	32-37 ft BGS	37-42 ft BGS	37-42 ft BGS
	USEPA Regional Screening Levels													Duplicate
Parameter	MCL a	TapWater b												
Volatiles														
1,1,1-Trichloroethane	200	9100	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.4 J	1.8	2.1	3.0	2.3	1.2	0.93 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	2.0 U	1.0 U	1.0 U	0.32 J	0.25 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Acetone	-	22000	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.45 J	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Bromomethane (Methyl bromide)	-	8.7	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	0.70 J	0.38 J	0.36 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	30	19	19	12	7.7	3.4	2.9	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	2.0 U	0.26 J	0.20 J	0.17 J	0.20 J	0.18 J	0.20 J	0.44 J	0.47 J	0.49 J	0.35 J	0.32 J
Dibromochloromethane	-	0.15	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.45 J	0.39 J	0.47 J	0.32 J	0.32 J
Isopropyl benzene	-	680	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	20 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.71 J	0.61 J	0.68 J	0.53 J	1.0 UJ
Methyl tert butyl ether (MTBE)	-	12	10 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	0.61 J	0.67 J	0.53 J	0.44 J	0.53 J	0.47 J	0.50 J	1.8	1.7	1.8	1.3	1.4
trans-1,2-Dichloroethene	100	110	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	2	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Vinyl chloride	2	0.016	65 J[a]	28[a]	24[a]	12[a]	12[a]	12[a]	13[a]	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Xylene (total)	10000	200	4.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.78 J	0.75 J	0.78 J	0.56 J	0.51 J
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	1.0 U	-	-	-	-	-	1.0 UJ	1.0 U	-	-	-	-
2,4,5-Trichlorophenol	-	3700	5.0 U	-	-	-	-	-	5.0 U	5.0 U	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	5.0 U	-	-	-	-	-	5.0 U	5.0 U	-	-	-	-
2,4-Dichlorophenol	-	110	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-
2,4-Dimethylphenol	-	730	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-
2,4-Dinitrophenol	-	73	5.0 U	-	-	-	-	-	5.0 U	5.0 U	-	-	-	-
2,4-Dinitrotoluene	-	0.22	5.0 U	-	-	-	-	-	5.0 U	5.0 U	-	-	-	-
2,6-Dinitrotoluene	-	37	5.0 U	-	-	-	-	-	5.0 U	5.0 U	-	-	-	-
2-Chloronaphthalene	-	2900	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
2-Chlorophenol	-	180	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
2-Methylnaphthalene	-	150	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
2-Methylphenol	-	1800	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
2-Nitroaniline	-	370	2.0 U	-	-	-	-	-	2.0 UJ	2.0 U	-	-	-	-
2-Nitrophenol	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	5.0 U	-	-	-	-	-	5.0 U	5.0 U	-	-	-	-
3-Nitroaniline	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	5.0 U	-	-	-	-	-	5.0 U	5.0 U	-	-	-	-
4-Bromophenyl phenyl ether	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-
4-Chloro-3-methylphenol	-	3700	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-19*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*	*VAS-20*
Sample ID:			*GW-38443-121608-DD-198*	*GW-38443-121608-DD-199*	*GW-38443-121608-DD-200*	*GW-38443-121608-DD-201*	*GW-38443-121608-DD-202*	*GW-38443-121608-DD-203*	*GW-38443-121608-DD-204*	*GW-38443-011109-KMV-229*	*GW-38443-011109-KMV-230*	*GW-38443-011109-KMV-231*	*GW-38443-011109-KMV-232*	*GW-38443-011109-KMV-233*
Sample Date:			*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*12/16/2008*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*	*1/11/2009*
Sample Depth:			*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*22-27 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*37-42 ft BGS*	*37-42 ft BGS*
	USEPA Regional Screening Levels													*Duplicate*
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-
4-Methylphenol	-	180	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
4-Nitroaniline	-	3.4	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-
4-Nitrophenol	-	-	5.0 U	-	-	-	-	-	5.0 U	5.0 U	-	-	-	-
Acenaphthene	-	2200	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Acenaphthylene	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Acetophenone	-	3700	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Anthracene	-	11000	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Atrazine	3	0.29	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Benzaldehyde	-	3700	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Benzo(a)anthracene	-	0.029	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Benzo(b)fluoranthene	-	0.029	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Benzo(g,h,i)perylene	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Benzo(k)fluoranthene	-	0.29	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	2.0 U	-	-	-	-	-	2.0 U	2.0 U	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Caprolactam	-	18000	5.0 UJ	-	-	-	-	-	5.0 UJ	5.0 UJ	-	-	-	-
Carbazole	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Chrysene	-	2.9	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Dibenzofuran	-	37	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Diethyl phthalate	-	29000	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Dimethyl phthalate	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Fluoranthene	-	1500	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Fluorene	-	1500	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Hexachlorobenzene	1	0.042	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Hexachlorobutadiene	-	0.86	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Hexachlorocyclopentadiene	50	220	10 U	-	-	-	-	-	10 U	10 U	-	-	-	-
Hexachloroethane	-	4.8	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Isophorone	-	71	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Naphthalene	-	0.14	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Nitrobenzene	-	0.12	1.0 U	-	-	-	-	-	1.0 UJ	1.0 U	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
N-Nitrosodiphenylamine	-	14	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Pentachlorophenol	1	0.56	5.0 U	-	-	-	-	-	5.0 U	5.0 U	-	-	-	-
Phenanthrene	-	-	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Phenol	-	11000	1.0 U	-	-	-	-	-	1.0 U	1.0 U	-	-	-	-
Pyrene	-	1100	0.20 U	-	-	-	-	-	0.20 U	0.20 U	-	-	-	-
Metals														
Arsenic	10	0.045	22.0[a]	12.0[a]	15.3[a]	37.6[a]	29.5[a]	21.7[a]	22.2[a]	34.4[a]	129[a]	60.8[a]	46.3[a]	31.5[a]
Arsenic (dissolved)	10	0.045	-	-	-	-	4.4 J	-	-	-	-	-	-	-
Lead	15	-	46.5[a]	34.5[a]	31.7[a]	80.6[a]	68.7[a]	74.4[a]	66.1[a]	29.8[a]	98.9[a]	44.1[a]	45.6[a]	30.2[a]
Lead (dissolved)	15	-	-	-	-	-	1.0 U	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-20*	*VAS-20*	*VAS-20*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*
Sample ID:			*GW-38443-011109-KMV-234*	*GW-38443-011109-KMV-235*	*GW-38443-011109-KMV-236*	*GW-38443-102908-KMV-001*	*GW-38443-102908-KMV-002*	*GW-38443-103008-KMV-003*	*GW-38443-103008-KMV-004*	*GW-38443-103009-KMV-005*	*GW-38443-103108-KMV-006*	*GW-38443-103108-KMV-007*	*GW-38443-110308-KMV-008*	*GW-38443-110308-KMV-009*
Sample Date:			*1/11/2009*	*1/11/2009*	*1/11/2009*	*10/28/2008*	*10/29/2008*	*10/30/2008*	*10/30/2008*	*10/30/2008*	*10/31/2008*	*10/31/2008*	*11/3/2008*	*11/3/2008*
Sample Depth:			*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*25-30 ft BGS*	*44-49 ft BGS*	*49-54 ft BGS*	*54-59 ft BGS*	*59-64 ft BGS*	*64-69 ft BGS*	*69-74 ft BGS*	*74-79 ft BGS*	*79-84 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,1-Dichloroethane	-	2.4	1.0 U	0.78 J	0.87 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.9 U	2.0 U	2.9 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	14 U	10 U	14 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	14 U	10 U	14 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 UJ	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	14 U	10 U	14 U
Acetone	-	22000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	14 U	10 U	14 U
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0	11[a]	3.7	1.4 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Bromoform	-	8.5	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.49 J	1.0 U	1.4 U	1.0 U	1.4 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	1.0 U	3.1	0.29 J	0.43 J	1.0 U	0.73 J	9.9	42	12	1.4 U
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 UJ	1.4 UJ
Cyclohexane	-	13000	0.14 J	0.29 J	0.33 J	0.12 J	1.0 U	1.0 U	1.0 U	1.0 U	0.24 J	1.4 U	1.0 U	1.4 U
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 UJ	1.4 U
Ethylbenzene	700	1.5	1.0 U	0.26 J	0.32 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	14 U	10 U	14 U
Methyl cyclohexane	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 UJ	1.4 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	7.2 U	5.0 U	7.2 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 UJ	1.4 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 UJ	1.4 UJ
Toluene	1000	2300	0.59 J	1.7	1.2	0.33 J	1.0 U	1.0 U	0.22 J	1.0 U	1.2	1.2 J	1.0 U	1.4 U
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 UJ	1.4 UJ
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	35[a]	2.2	0.53 J	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.4 U
Vinyl chloride	2	0.016	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.4	1.8	0.76 J	1.8	7.1[a]	35[a]	12[a]	35[a]
Xylene (total)	10000	200	2.0 U	0.72 J	0.62 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.9 U	2.0 U	2.9 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
2,4,5-Trichlorophenol	-	3700	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
2,4,6-Trichlorophenol	-	6.1	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
2,4-Dichlorophenol	-	110	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
2,4-Dimethylphenol	-	730	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
2,4-Dinitrophenol	-	73	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
2,4-Dinitrotoluene	-	0.22	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
2,6-Dinitrotoluene	-	37	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
2-Chloronaphthalene	-	2900	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
2-Chlorophenol	-	180	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
2-Methylnaphthalene	-	150	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
2-Methylphenol	-	1800	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
2-Nitroaniline	-	370	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
2-Nitrophenol	-	-	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
3,3'-Dichlorobenzidine	-	0.15	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
3-Nitroaniline	-	-	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
4,6-Dinitro-2-methylphenol	-	3.7	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
4-Bromophenyl phenyl ether	-	-	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
4-Chloro-3-methylphenol	-	3700	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-20*	*VAS-20*	*VAS-20*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21*
Sample ID:			*GW-38443-011109-KMV-234*	*GW-38443-011109-KMV-235*	*GW-38443-011109-KMV-236*	*GW-38443-102808-KMV-001*	*GW-38443-102808-KMV-002*	*GW-38443-103008-KMV-003*	*GW-38443-103008-KMV-004*	*GW-38443-103008-KMV-005*	*GW-38443-103108-KMV-006*	*GW-38443-103108-KMV-007*	*GW-38443-110308-KMV-008*	*GW-38443-110308-KMV-009*
Sample Date:			*1/11/2009*	*1/11/2009*	*1/11/2009*	*10/28/2008*	*10/28/2008*	*10/30/2008*	*10/30/2008*	*10/30/2008*	*10/31/2008*	*10/31/2008*	*11/3/2008*	*11/3/2008*
Sample Depth:			*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*25-30 ft BGS*	*44-49 ft BGS*	*49-54 ft BGS*	*54-59 ft BGS*	*59-64 ft BGS*	*64-69 ft BGS*	*69-74 ft BGS*	*74-79 ft BGS*	*79-84 ft BGS*
	USEPA Regional Screening Levels													
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
Semi-Volatiles (continued)														
4-Chlorophenyl phenyl ether	-	-	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
4-Methylphenol	-	180	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
4-Nitroaniline	-	3.4	2.0 U	-	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
4-Nitrophenol	-	-	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
Acenaphthene	-	2200	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Acenaphthylene	-	-	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Acetophenone	-	3700	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Anthracene	-	11000	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Atrazine	3	0.29	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Benzaldehyde	-	3700	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Benzo(a)anthracene	-	0.029	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Benzo(a)pyrene	0.2	0.0029	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Benzo(b)fluoranthene	-	0.029	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Benzo(g,h,i)perylene	-	-	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Benzo(k)fluoranthene	-	0.29	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Biphenyl (1,1-Biphenyl)	-	1800	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
bis(2-Chloroethoxy)methane	-	110	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
bis(2-Chloroethyl)ether	-	0.012	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	3.3	-	7.9[a]	0.91 J	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	-	2.0 U	-
Butyl benzylphthalate (BBP)	-	35	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Caprolactam	-	18000	5.0 UJ	-	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 UJ	-
Carbazole	-	-	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Chrysene	-	2.9	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Dibenz(a,h)anthracene	-	0.0029	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Dibenzofuran	-	37	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Diethyl phthalate	-	29000	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Dimethyl phthalate	-	-	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Di-n-butylphthalate (DBP)	-	3700	1.0 U	-	1.0 U	3.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Di-n-octyl phthalate (DnOP)	-	-	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Fluoranthene	-	1500	0.20 U	-	0.20 U	0.45	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Fluorene	-	1500	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Hexachlorobenzene	1	0.042	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Hexachlorobutadiene	-	0.86	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Hexachlorocyclopentadiene	50	220	10 U	-	10 U	10 U	10 U	R	R	R	R	-	10 U	-
Hexachloroethane	-	4.8	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Indeno(1,2,3-cd)pyrene	-	0.029	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Isophorone	-	71	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Naphthalene	-	0.14	0.20 U	-	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Nitrobenzene	-	0.12	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
N-Nitrosodi-n-propylamine	-	0.0096	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
N-Nitrosodiphenylamine	-	14	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Pentachlorophenol	1	0.56	5.0 U	-	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	-	5.0 U	-
Phenanthrene	-	-	0.20 U	-	0.20 U	0.39	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Phenol	-	11000	1.0 U	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	-	1.0 U	-
Pyrene	-	1100	0.20 U	-	0.20 U	0.35	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	-	0.20 U	-
Metals														
Arsenic	10	0.045	8.6	86.8[a]	23.5[a]	22.3[a]	10.0	0.55 J	0.77 J	0.82 J	0.58 J	0.97 J	2.2 J	4.0 J
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	-	-
Lead	15	-	6.7	86.6[a]	22.4[a]	41.3[a]	10.1	0.21 J	1.0 U	0.25 J	1.0 U	1.0 U	0.51 J	3.9
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*
Sample ID:			*GW-38443-110408-KMV-010*	*GW-38443-110408-KMV-011*	*GW-38443-110408-KMV-012*	*GW-38443-060209-DR-001*	*GW-38443-060209-DR-002*	*GW-38443-060309-DR-004*	*GW-38443-060309-DR-005*	*GW-38443-060309-DR-006*	*GW-38443-060309-DR-007*	*GW-38443-060309-DR-008*	*GW-38443-060409-DR-009*
Sample Date:			*11/4/2008*	*11/4/2008*	*11/4/2008*	*6/2/2009*	*6/2/2009*	*6/3/2009*	*6/3/2009*	*6/3/2009*	*6/3/2009*	*6/3/2009*	*6/4/2009*
Sample Depth:			*84-89 ft BGS*	*89-94 ft BGS*	*94-99 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*97-102 ft BGS*	*97-102 ft BGS*	*102-107 ft BGS*	*107-112 ft BGS*	*112-117 ft BGS*	*117-122 ft BGS*
	USEPA Regional Screening Levels								*Duplicate*				
Parameter	*MCL a*	*TapWater b*											
Volatiles													
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	20 U	3.3 U	6.7 U	40 U	40 U	40 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	100 U	17 U	33 U	200 U	200 U	200 U	1.8 J	10 U	10 U
2-Hexanone	-	47	10 U	10 U	100 U	17 U	33 U	200 U	200 U	200 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	100 U	17 UJ	33 UJ	200 UJ	200 UJ	200 UJ	10 UJ	10 UJ	10 U
Acetone	-	22000	10 U	10 U	100 U	17 U	33 U	200 U	200 U	200 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	1.7	300[a]	48[a]	95[a]	580[a]	550[a]	540[a]	4.8	3.3	1.3 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	10 UJ	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Cyclohexane	-	13000	1.0 U	1.0 U	10 UJ	0.93 J	1.7 J	20 UJ	20 UJ	20 UJ	0.58 J	0.58 J	1.0 U
Dibromochloromethane	-	0.15	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	10 UJ	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	1.0 U	1.0 U	10 UJ	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	100 U	17 UJ	33 UJ	200 UJ	200 UJ	200 UJ	10 UJ	10 UJ	10 U
Methyl cyclohexane	-	-	1.0 UJ	1.0 UJ	10 UJ	1.1 J	1.9 J	20 UJ	20 UJ	20 UJ	0.67 J	0.65 J	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	50 U	8.4 U	17 U	100 U	100 U	100 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 UJ	1.0 UJ	14 UJ	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 UJ	1.0 UJ	10 UJ	0.96 J	3.3 U	20 U	20 U	20 U	0.33 J	0.55 J	0.37 J
Toluene	1000	2300	1.0 U	1.0 U	10 U	1.4 J	0.93 J	20 U	20 U	20 U	1.4	1.4	1.0 U
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	10 UJ	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	2	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	10 U	1.7 U	3.3 U	20 U	20 U	20 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	38[a]	0.32 J	10 U	5.0[a]	5.2[a]	20 U	20 U	20 U	1.0 U	1.0 U	6.7 U
Xylene (total)	10000	200	2.0 U	2.0 U	20 UJ	3.3 U	6.7 U	40 U	40 U	40 U	2.0 U	0.49 J	2.0 U
Semi-Volatiles													
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-

TABLE A4.4a

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-21*	*VAS-21*	*VAS-21*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*
Sample ID:			*GW-38443-110408-KMV-010*	*GW-38443-110408-KMV-011*	*GW-38443-110408-KMV-012*	*GW-38443-060209-DR-001*	*GW-38443-060209-DR-002*	*GW-38443-060309-DR-004*	*GW-38443-060309-DR-005*	*GW-38443-060309-DR-006*	*GW-38443-060309-DR-007*	*GW-38443-060309-DR-008*	*GW-38443-060409-DR-009*
Sample Date:			*11/4/2008*	*11/4/2008*	*11/4/2008*	*6/2/2009*	*6/2/2009*	*6/3/2009*	*6/3/2009*	*6/3/2009*	*6/3/2009*	*6/3/2009*	*6/4/2009*
Sample Depth:			*84-89 ft BGS*	*89-94 ft BGS*	*94-99 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*	*97-102 ft BGS*	*97-102 ft BGS*	*102-107 ft BGS*	*107-112 ft BGS*	*112-117 ft BGS*	*117-122 ft BGS*
	USEPA Regional Screening Levels								*Duplicate*				
Parameter	*MCL* a	*TapWater* b											
4-Chloroaniline	-	0.34	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-
Semi-Volatiles (continued)													
4-Chlorophenyl phenyl ether	-	-	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	2.0 U	-	2.0 U	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Acetophenone	-	3700	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Anthracene	-	11000	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Atrazine	3	0.29	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	3.2 U	-	2.3 U	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	1.0	-	1.0 U	-	-	-	-	-	-	-	-
Caprolactam	-	18000	5.0 UJ	-	5.0 UJ	-	-	-	-	-	-	-	-
Carbazole	-	-	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Chrysene	-	2.9	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Fluorene	-	1500	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	10 U	-	10 U	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Isophorone	-	71	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	5.0 U	-	5.0 U	-	-	-	-	-	-	-	-
Phenanthrene	-	-	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Phenol	-	11000	1.0 U	-	1.0 U	-	-	-	-	-	-	-	-
Pyrene	-	1100	0.20 U	-	0.20 U	-	-	-	-	-	-	-	-
Metals													
Arsenic	10	0.045	6.3	1.4 J	6.4	15.8[a]	8.2	70.1 J[a]	39.3 J[a]	31.1[a]	125[a]	58.1[a]	1.3 J
Arsenic (dissolved)	10	0.045	-	-	-	1.2 J	1.2 J	6.8	6.3	5.8	1.8 J	1.2 J	1.2 J
Lead	15	-	7.4	1.4	6.4	29.6[a]	13.8	147 J[a]	92.9 J[a]	75.4 J[a]	235 J[a]	116 J[a]	0.38 J
Lead (dissolved)	15	-	-	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*
Sample ID:			*GW-38443-060409-DR-010*	*GW-38443-060409-DR-012*	*GW-38443-060409-DR-013*	*GW-38443-060409-DR-014*	*GW-38443-060409-DR-015*	*GW-38443-060509-DR-017*	*GW-38443-060509-DR-018*	*GW-38443-060509-DR-019*	*GW-38443-060509-DR-020*	*GW-38443-060509-DR-021*	*GW-38443-060509-DR-022*	*GW-38443-060509-DR-023*	*GW-38443-060509-DR-024*
Sample Date:			*6/4/2009*	*6/4/2009*	*6/4/2009*	*6/4/2009*	*6/4/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*
Sample Depth:			*122-127 ft BGS*	*127-132 ft BGS*	*132-137 ft BGS*	*137-142 ft BGS*	*142-147 ft BGS*	*147-152 ft BGS*	*147-152 ft BGS*	*152-157 ft BGS*	*157-162 ft BGS*	*162-167 ft BGS*	*167-172 ft BGS*	*172-177 ft BGS*	*177-182 ft BGS*
	USEPA Regional Screening Levels								*Duplicate*						
Parameter	*MCL a*	*TapWater b*													
Volatiles															
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	2.0 U	2.0 U	2.9 U	3.3 U	3.3 U	3.3 U	3.3 U	2.9 U	2.0 U	2.9 U	3.3 U	3.3 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	14 U	17 U	17 U	17 U	17 U	14 U	0.66 J	14 U	1.4 J	1.0 J
2-Hexanone	-	47	10 U	10 U	10 U	14 U	17 U	17 U	17 U	17 U	14 U	10 U	14 U	17 U	17 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	14 U	17 U	17 U	17 U	17 U	14 U	10 U	0.57 J	2.0 J	0.71 J
Acetone	-	22000	10 U	10 U	10 U	14 U	17 U	17 U	17 U	17 U	14 U	10 U	14 U	17 U	17 U
Benzene	5	0.41	1.1 U	1.9 U	1.6 U	1.4 U	1.7 U	1.5 J[b]	1.5 J[b]	1.2 J[b]	0.78 J[b]	0.76 J[b]	0.95 J[b]	1.3 J[b]	1.7 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 UJ
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
[illegible]oroethane	-	21000	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
[illegible]oform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
[illegible]romethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
cis-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Cyclohexane	-	13000	1.0 U	0.18 J	0.14 J	0.17 J	1.7 U	1.7 U	1.7 U	1.7 U	0.21 J	0.35 J	1.4 U	1.7 U	1.7 U
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Ethylbenzene	700	1.5	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	0.22 J	1.4 U	1.7 U	1.7 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Methyl acetate	-	37000	10 U	10 U	10 U	14 U	17 U	17 U	17 U	17 U	14 U	10 U	14 U	17 U	17 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	7.2 U	8.4 U	8.4 U	8.4 U	8.4 U	7.2 U	5.0 U	7.2 U	8.4 U	8.4 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 UJ	1.7 UJ	1.7 UJ	1.4 UJ	1.0 UJ	1.4 UJ	1.7 UJ	1.7 U
Toluene	1000	2300	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	0.91 J	0.87 J	0.70 J	0.87 J	1.3	0.83 J	1.3 J	0.85 J
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.4 U	1.7 U	1.7 U	1.7 U	1.7 U	1.4 U	1.0 U	1.4 U	1.7 U	1.7 U
Vinyl chloride	2	0.016	5.5 U	15[ab]	19[ab]	46[ab]	67[ab]	68[ab]	67[ab]	51[ab]	39[ab]	38[ab]	42[ab]	42[ab]	45[ab]
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	2.9 U	3.3 U	3.3 U	3.3 U	3.3 U	2.9 U	0.84 J	2.9 U	3.3 U	3.3 U
Semi-Volatiles															
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]richlorobenzidine	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]roaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
[illegible]-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-21B*
Sample ID:			*GW-38443-060409-DR-010*	*GW-38443-060409-DR-012*	*GW-38443-060409-DR-013*	*GW-38443-060409-DR-014*	*GW-38443-060409-DR-015*	*GW-38443-060509-DR-017*	*GW-38443-060509-DR-018*	*GW-38443-060509-DR-019*	*GW-38443-060509-DR-020*	*GW-38443-060509-DR-021*	*GW-38443-060509-DR-022*	*GW-38443-060509-DR-023*	*GW-38443-060509-DR-024*
Sample Date:			*6/4/2009*	*6/4/2009*	*6/4/2009*	*6/4/2009*	*6/4/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/5/2009*	*6/6/2009*
Sample Depth:			*122-127 ft BGS*	*127-132 ft BGS*	*132-137 ft BGS*	*137-142 ft BGS*	*142-147 ft BGS*	*147-152 ft BGS*	*147-152 ft BGS*	*152-157 ft BGS*	*157-162 ft BGS*	*162-167 ft BGS*	*167-172 ft BGS*	*172-177 ft BGS*	*177-182 ft BGS*
	USEPA Regional Screening Levels								*Duplicate*						
Parameter	*MCL a*	*TapWater b*													
4-Chloroaniline	-	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Atrazine	3	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	-	18000	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	71	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1100	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals															
Arsenic	10	0.045	0.84 j[b]	30.7[ab]	14.7[ab]	58.7[ab]	25.1[ab]	153[abr]	141[ab]	54.5[ab]	183[abr]	373[abr]	37.0[ab]	52.2[ab]	13.0[ab]
Arsenic (dissolved)	10	0.045	0.92 j[b]	0.76 j[b]	0.55 j[b]	1.4 j[b]	1.5 j[b]	3.1 j[b]	3.1 j[b]	4.2 j[b]	4.6 j[b]	5.3[b]	3.8 j[b]	3.4 j[b]	3.3 j[b]
Lead	15	-	0.54 J	68.0[ar]	35.4[a]	143[ar]	59.2[ar]	161[ar]	148[ar]	64.3[ar]	62.0[ar]	178[ar]	23.1[a]	34.9[a]	5.8
Lead (dissolved)	15	-	1.0 U	1.0 U	1.0 U	0.23 J	0.18 J	1.0 U	1.0 U	1.0 U	0.25 J	1.0 U	1.0 U	0.25 J	1.0 U

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The asiociate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-23*	*VAS-23*	*VAS-23*
Sample ID:			*GW-38443-060609-DR-025*	*GW-38443-060609-DR-026*	*GW-38443-060609-DR-027*	*GW-38443-121808-DD-205*	*GW-38443-121808-DD-206*	*GW-38443-121808-DD-207*	*GW-38443-121808-DD-208*	*GW-38443-121808-DD-209*	*GW-38443-121808-DD-210*	*GW-38443-120408-DD-159*	*GW-38443-120408-DD-160*	*GW-38443-120408-DD-161*
Sample Date:			*6/6/2009*	*6/6/2009*	*6/6/2009*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/4/2008*	*12/4/2008*	*12/4/2008*
Sample Depth:			*182-187 ft BGS*	*187-192 ft BGS*	*192-197 ft BGS*	*27-32 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*27-32.5 ft BGS*	*27-32.5 ft BGS*	*37-42 ft BGS*
	USEPA Regional Screening Levels						*Duplicate*						*Duplicate*	
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.7 U	1.0 U	1.0 U	1.0	0.94 J	1.1	0.57 J	0.50 J	0.45 J	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	3.3 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	1.2 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	17 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	*2000*	*0.62 J*	*10 U*	*10 U*	*10 U*	*10 U*	*10 U*	*10 U*	*10 U*	*10 U*	*10 U*	*10 U*	*10 U*
Acetone	-	22000	17 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.24 J	1.0 U
Bromodichloromethane	-	0.12	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.7 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
[illegible]oroethane	-	21000	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
[illegible]roform (Trichloromethane)	-	0.19	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
[illegible]romethane (Methyl chloride)	-	190	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.7 U	1.0 U	1.0 U	0.60 J	0.53 J	0.58 J	1.0 U	0.87 J	0.98 J	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	1.7 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U
Cyclohexane	-	13000	1.7 U	0.17 J	1.0 U	0.14 J	0.18 J	0.21 J	1.0 U	0.20 J	0.17 J	0.16 J	0.16 J	0.12 J
Dibromochloromethane	-	0.15	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	17 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	8.4 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	0.82 J	0.83 J	0.69 J	3.8	3.2	6.2	2.2	1.8	1.4	4.8	3.5	2.2
trans-1,2-Dichloroethene	100	110	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	2	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.7 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	45[ab]	30[ab]	29[ab]	0.66 J[b]	0.58 J[b]	0.75 J[b]	0.36 J[b]	0.64 J[b]	0.71 J[b]	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	3.3 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
2,4,5-Trichlorophenol	-	3700	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	-	6.1	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dichlorophenol	-	110	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dimethylphenol	-	730	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U
2,4-Dinitrophenol	-	73	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrotoluene	-	0.22	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2,6-Dinitrotoluene	-	37	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene	-	2900	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorophenol	-	180	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
2-Methylnaphthalene	-	150	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
2-Methylphenol	-	1800	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
2-Nitroaniline	-	370	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U
2-Nitrophenol	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U
[illegible]-Dichlorobenzidine	-	0.15	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
[illegible]troaniline	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U
[illegible]-Dinitro-2-methylphenol	-	3.7	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
4-Bromophenyl phenyl ether	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U
4-Chloro-3-methylphenol	-	3700	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-21B*	*VAS-21B*	*VAS-21B*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-22*	*VAS-23*	*VAS-23*	*VAS-23*
Sample ID:			*GW-38443-060609-DR-025*	*GW-38443-060609-DR-026*	*GW-38443-060609-DR-027*	*GW-38443-121808-DD-205*	*GW-38443-121808-DD-206*	*GW-38443-121808-DD-207*	*GW-38443-121808-DD-208*	*GW-38443-121808-DD-209*	*GW-38443-121808-DD-210*	*GW-38443-120408-DD-159*	*GW-38443-120408-DD-160*	*GW-38443-120408-DD-161*
Sample Date:			*6/6/2009*	*6/6/2009*	*6/6/2009*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/18/2008*	*12/4/2008*	*12/4/2008*	*12/4/2008*
Sample Depth:			*182-187 ft BGS*	*187-192 ft BGS*	*192-197 ft BGS*	*27-32 ft BGS*	*27-32 ft BGS*	*32-37 ft BGS*	*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*27-32.5 ft BGS*	*27-32.5 ft BGS*	*37-42 ft BGS*
	USEPA Regional Screening Levels						*Duplicate*						*Duplicate*	
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U
4-Chlorophenyl phenyl ether	-	-	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U
4-Methylphenol	-	180	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
4-Nitroaniline	-	3.4	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	2.0 U	2.0 U	2.0 U
4-Nitrophenol	-	-	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthene	-	2200	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Acenaphthylene	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Acetophenone	-	3700	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	-	11000	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Atrazine	3	0.29	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Benzaldehyde	-	3700	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)anthracene	-	0.029	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(a)pyrene	0.2	0.0029	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(b)fluoranthene	-	0.029	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(g,h,i)perylene	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Benzo(k)fluoranthene	-	0.29	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethoxy)methane	-	110	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Chloroethyl)ether	-	0.012	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	2.0 U	2.0 U	2.0 U	-	-	2.0 U	0.90 J	2.0 U	0.90 J
Butyl benzylphthalate (BBP)	-	35	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Caprolactam	-	18000	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
Carbazole	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Chrysene	-	2.9	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Dibenz(a,h)anthracene	-	0.0029	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Dibenzofuran	-	37	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Diethyl phthalate	-	29000	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Dimethyl phthalate	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-butylphthalate (DBP)	-	3700	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Fluoranthene	-	1500	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Fluorene	-	1500	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobenzene	1	0.042	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Hexachlorobutadiene	-	0.86	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Hexachlorocyclopentadiene	50	220	-	-	-	10 U	10 U	10 U	-	-	10 U	10 U	10 U	10 U
Hexachloroethane	-	4.8	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Isophorone	-	71	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene	-	0.14	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Nitrobenzene	-	0.12	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
N-Nitrosodiphenylamine	-	14	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Pentachlorophenol	1	0.56	-	-	-	5.0 U	5.0 U	5.0 U	-	-	5.0 U	5.0 U	5.0 U	5.0 U
Phenanthrene	-	-	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Phenol	-	11000	-	-	-	1.0 U	1.0 U	1.0 U	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Pyrene	-	1100	-	-	-	0.20 U	0.20 U	0.20 U	-	-	0.20 U	0.20 U	0.20 U	0.20 U
Metals														
Arsenic	10	0.045	13.5[ab]	10.0[b]	6.8[b]	127[ab]	132[ab]	71.4[ab]	176[abc]	142[ab]	49.5[ab]	49.6[ab]	50.9[ab]	48.6[ab]
Arsenic (dissolved)	10	0.045	3.2 J[b]	3.2 J[b]	2.7 J[b]	-	-	-	6.3[b]	-	-	-	-	-
Lead	15	-	5.4	6.8	3.8	309[ac]	325[ac]	183[ac]	451[ac]	342[ac]	110[ac]	63.3[ac]	64.0[ac]	70.0[ac]
Lead (dissolved)	15	-	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*
Sample ID:			*GW-38443-120508-DD-162*	*GW-38443-120508-DD-163*	*GW-38443-120508-DD-164*	*GW-38443-120508-DD-165*	*GW-38443-120508-DD-166*	*GW-38443-120508-DD-167*	*GW-38443-120508-DD-168*	*GW-38443-120508-DD-169*	*GW-38443-120508-DD-170*	*GW-38443-120508-DD-171*	*GW-38443-120508-DD-172*	*GW-38443-120508-DD-173*
Sample Date:			*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*
Sample Depth:			*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*
	USEPA Regional Screening Levels					*Duplicate*								
Parameter	*MCL* *a*	*TapWater* *b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	0.24 J	0.27 J	0.29 J	0.23 J	0.25 J	0.25 J	0.24 J	0.28 J	0.25 J	1.0 U	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	0.16 J	0.12 J	0.21 J	0.21 J	0.16 J	0.18 J	0.18 J	0.17 J	0.19 J	0.19 J	0.17 J	0.22 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ
Toluene	1000	2300	2.2	0.75 J	0.87 J	1.0	0.87 J	1.3	0.70 J	0.85 J	0.76 J	1.0	0.46 J	0.58 J
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	1.0 U	0.44 J[b]	0.72 J[b]	0.77 J[b]	0.89 J[b]	0.48 J[b]	0.47 J[b]	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U
2,4-Dichlorophenol	-	110	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
2,4-Dimethylphenol	-	730	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
2,4-Dinitrophenol	-	73	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U
2,6-Dinitrotoluene	-	37	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U
2-Chloronaphthalene	-	2900	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
2-Chlorophenol	-	180	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
2-Methylnaphthalene	-	150	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
2-Methylphenol	-	1800	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
2-Nitroaniline	-	370	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
2-Nitrophenol	-	-	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
3,3'-Dichlorobenzidine	-	0.15	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U
3-Nitroaniline	-	-	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*	*VAS-23*
Sample ID:			*GW-38443-120608-DD-162*	*GW-38443-120608-DD-163*	*GW-38443-120608-DD-164*	*GW-38443-120608-DD-165*	*GW-38443-120608-DD-166*	*GW-38443-120608-DD-167*	*GW-38443-120608-DD-168*	*GW-38443-120608-DD-169*	*GW-38443-120608-DD-170*	*GW-38443-120608-DD-171*	*GW-38443-120608-DD-172*	*GW-38443-120608-DD-173*
Sample Date:			*12/6/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/5/2008*	*12/6/2008*	*12/6/2008*
Sample Depth:			*42-47 ft BGS*	*47-52 ft BGS*	*52-57 ft BGS*	*52-57 ft BGS*	*57-62 ft BGS*	*62-67 ft BGS*	*67-72 ft BGS*	*72-77 ft BGS*	*77-82 ft BGS*	*82-87 ft BGS*	*87-92 ft BGS*	*92-97 ft BGS*
	USEPA Regional Screening Levels					*Duplicate*								
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
4-Methylphenol	-	180	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
4-Nitroaniline	-	3.4	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
4-Nitrophenol	-	-	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U
Acenaphthene	-	2200	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Acenaphthylene	-	-	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Acetophenone	-	3700	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Anthracene	-	11000	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Atrazine	3	0.29	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Benzaldehyde	-	3700	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Benzo(a)anthracene	-	0.029	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	2.0 U	-	-	-	-	-	2.0 U
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Caprolactam	-	18000	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 UJ
Carbazole	-	-	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Chrysene	-	2.9	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Dibenzofuran	-	37	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Diethyl phthalate	-	29000	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Dimethyl phthalate	-	-	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Fluoranthene	-	1500	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Fluorene	-	1500	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Hexachlorobenzene	1	0.042	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Hexachlorobutadiene	-	0.86	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	10 U	-	-	-	-	-	10 U
Hexachloroethane	-	4.8	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Isophorone	-	71	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Naphthalene	-	0.14	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Nitrobenzene	-	0.12	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Pentachlorophenol	1	0.56	-	-	-	-	-	5.0 U	-	-	-	-	-	5.0 U
Phenanthrene	-	-	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Phenol	-	11000	-	-	-	-	-	1.0 U	-	-	-	-	-	1.0 U
Pyrene	-	1100	-	-	-	-	-	0.20 U	-	-	-	-	-	0.20 U
Metals														
Arsenic	10	0.045	30.1[ab]	67.6[ab]	36.4[ab]	34.3[ab]	71.0[ab]	39.4[ab]	58.2[ab]	26.6[ab]	63.6[ab]	25.5[ab]	47.9[ab]	26.9[ab]
Arsenic (dissolved)	10	0.045	-	-	-	-	-	-	-	-	-	-	4.3 J[b]	-
Lead	15	-	98.9[ac]	128[ac]	52.9[ac]	49.8[ac]	186[ac]	75.0[ac]	82.1[ac]	36.3[a]	107[ac]	32.6[a]	91.5[ac]	54.2[ac]
Lead (dissolved)	15	-	-	-	-	-	-	-	-	-	-	-	0.58 J	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

- Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:	USEPA Regional Screening Levels		VAS-23	VAS-24	VAS-24	VAS-24	VAS-24	VAS-24	VAS-24	VAS-24	VAS-25	VAS-25	VAS-25	VAS-25
Sample ID:			GW-38443-120608-DD-174	GW-38443-010709-DD-211	GW-38443-010709-DD-212	GW-38443-010709-DD-213	GW-38443-010709-DD-214	GW-38443-010709-DD-215	GW-38443-010709-DD-216	GW-38443-010709-DD-217	GW-38443-120608-KMV-060	GW-38443-120608-KMV-061	GW-38443-120608-KMV-062	GW-38443-120708-KMV-063
Sample Date:			12/6/2008	1/7/2009	1/7/2009	1/7/2009	1/7/2009	1/7/2009	1/7/2009	1/7/2009	12/6/2008	12/6/2008	12/6/2008	12/7/2008
Sample Depth:			92-97 ft BGS	27-32 ft BGS	32-37 ft BGS	32-37 ft BGS	37-42 ft BGS	42-47 ft BGS	47-52 ft BGS	52-57 ft BGS	25-30 ft BGS	30-35 ft BGS	30-35 ft BGS	50-55 ft BGS
			Duplicate			Duplicate							Duplicate	
Parameter	MCL a	TapWater b												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	13	13	12 J	6.8 J	8.3	6.5	5.2	2.7	13	14	0.29 J
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.0 U	0.31 J	0.33 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.64 J
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.22 J	0.22 J	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	1.4 J	1.2 J	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Acetone	-	22000	10 U	10 U	10 U	10 U	1.4 J	10 U	10 U	10 U	10 U	4.2 J	3.9 J	10 UJ
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.56 J[b]	0.53 J[b]	0.53 J[b]
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.31 J[b]	1.0 UJ	1.0 UJ	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	6.5[b]	0.28 J[b]	0.27 J[b]	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.60 J	0.99 J	1.0 U	1.0 U	1.0 U	10
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Cyclohexane	-	13000	0.21 J	0.56 J	0.39 J	0.38 J	0.44 J	0.36 J	0.32 J	0.43 J	1.0 U	0.57 J	0.66 J	0.22 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	1.0 U	0.35 J	0.22 J	0.21 J	0.23 J	0.20 J	1.0 U	0.21 J	1.0 UJ	0.45 J	0.42 J	1.0 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 U	0.58 J	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	0.61 J	0.72 J	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Toluene	1000	2300	0.64 J	4.4	3.0	3.1	2.5	2.4	1.6	2.1	0.19 J	1.2	1.2	0.48 J
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.7
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U
Trichloroethene	5	2	1.0 U	0.80 J	1.0	0.96 J	3.8 J[b]	4.5[b]	12[ab]	11[ab]	1.0 U	3.5[b]	3.8[b]	0.33 J
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	0.61 J	2.0 U	2.0 U	0.50 J	2.0 U	2.0 U	2.0 U	2.0 UJ	1.8 J	0.94 J	2.0 U
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
2,4,5-Trichlorophenol	-	3700	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 U	-	-	5.0 U
2,4,6-Trichlorophenol	-	6.1	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 U	-	-	5.0 U
2,4-Dichlorophenol	-	110	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U
2,4-Dimethylphenol	-	730	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U
2,4-Dinitrophenol	-	73	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 U	-	-	5.0 U
2,4-Dinitrotoluene	-	0.22	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 U	-	-	5.0 U
2,6-Dinitrotoluene	-	37	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 U	-	-	5.0 U
2-Chloronaphthalene	-	2900	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
2-Chlorophenol	-	180	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
2-Methylnaphthalene	-	150	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
2-Methylphenol	-	1800	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
2-Nitroaniline	-	370	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U
2-Nitrophenol	-	-	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U
3,3'-Dichlorobenzidine	-	0.15	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 U	-	-	5.0 U
3-Nitroaniline	-	-	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U
4,6-Dinitro-2-methylphenol	-	3.7	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 U	-	-	5.0 U
4-Bromophenyl phenyl ether	-	-	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U
4-Chloro-3-methylphenol	-	3700	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:	USEPA Regional Screening Levels		VAS-23	VAS-24	VAS-24	VAS-24	VAS-24	VAS-24	VAS-24	VAS-24	VAS-25	VAS-25	VAS-25	VAS-25
Sample ID:			GW-38443-120608-DD-176	GW-38443-010709-DD-211	GW-38443-010709-DD-212	GW-38443-010709-DD-213	GW-38443-010709-DD-214	GW-38443-010709-DD-215	GW-38443-010709-DD-216	GW-38443-010709-DD-217	GW-38443-120608-KMV-060	GW-38443-120608-KMV-061	GW-38443-120608-KMV-062	GW-38443-120708-KMV-063
Sample Date:			12/6/2008	1/7/2009	1/7/2009	1/7/2009	1/7/2009	1/7/2009	1/7/2009	1/7/2009	12/6/2008	12/6/2008	12/6/2008	12/7/2008
Sample Depth:			92-97 ft BGS	27-32 ft BGS	32-37 ft BGS	32-37 ft BGS	37-42 ft BGS	42-47 ft BGS	47-52 ft BGS	52-57 ft BGS	25-30 ft BGS	30-35 ft BGS	30-35 ft BGS	50-55 ft BGS
			Duplicate			Duplicate							Duplicate	
Parameter	*MCL* a	*TapWater* b												
4-Chloroaniline	-	0.34	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U
4-Chlorophenyl phenyl ether	-	-	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U
4-Methylphenol	-	180	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
4-Nitroaniline	-	3.4	2.0 U	2.0 U	2.0 U	2.0 U	-	-	-	2.0 U	2.0 U	-	-	2.0 U
4-Nitrophenol	-	-	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 U	-	-	5.0 U
Acenaphthene	-	2200	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.33	-	-	0.20 U
Acenaphthylene	-	-	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.30	-	-	0.20 U
Acetophenone	-	3700	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Anthracene	-	11000	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Atrazine	3	0.29	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Benzaldehyde	-	3700	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Benzo(a)anthracene	-	0.029	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Benzo(a)pyrene	0.2	0.0029	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Benzo(b)fluoranthene	-	0.029	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Benzo(g,h,i)perylene	-	-	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Benzo(k)fluoranthene	-	0.29	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Biphenyl (1,1-Biphenyl)	-	1800	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
bis(2-Chloroethoxy)methane	-	110	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
bis(2-Chloroethyl)ether	-	0.012	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	2.0 U	2.0 U	2.0 U	0.86 J	-	-	-	0.96 J	2.0 U	-	-	1.4 J
Butyl benzylphthalate (BBP)	-	35	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Caprolactam	-	18000	5.0 UJ	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 UJ	-	-	5.0 UJ
Carbazole	-	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Chrysene	-	2.9	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Dibenz(a,h)anthracene	-	0.0029	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Dibenzofuran	-	37	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Diethyl phthalate	-	29000	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Dimethyl phthalate	-	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Di-n-butylphthalate (DBP)	-	3700	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Di-n-octyl phthalate (DnOP)	-	-	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Fluoranthene	-	1500	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Fluorene	-	1500	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Hexachlorobenzene	1	0.042	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Hexachlorobutadiene	-	0.86	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Hexachlorocyclopentadiene	50	220	10 U	10 U	10 U	10 U	-	-	-	10 U	10 U	-	-	10 U
Hexachloroethane	-	4.8	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Indeno(1,2,3-cd)pyrene	-	0.029	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Isophorone	-	71	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Naphthalene	-	0.14	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Nitrobenzene	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
N-Nitrosodi-n-propylamine	-	0.0096	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
N-Nitrosodiphenylamine	-	14	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Pentachlorophenol	1	0.56	5.0 U	5.0 U	5.0 U	5.0 U	-	-	-	5.0 U	5.0 U	-	-	5.0 U
Phenanthrene	-	-	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Phenol	-	11000	1.0 U	1.0 U	1.0 U	1.0 U	-	-	-	1.0 U	1.0 U	-	-	1.0 U
Pyrene	-	1100	0.20 U	0.20 U	0.20 U	0.20 U	-	-	-	0.20 U	0.20 U	-	-	0.20 U
Metals														
Arsenic	10	0.045	31.6[ab]	47.6[ab]	38.0[ab]	37.4[ab]	52.2[ab]	27.4[ab]	97.4[ab]	57.8[ab]	16.5[ab]	46.7[ab]	39.8[ab]	67.6[ab]
Arsenic (dissolved)	10	0.045	-	-	-	-	18.9[ab]	-	-	-	-	-	-	-
Lead	15	-	58.8[ac]	69.3[ac]	38.8[ac]	38.8[ac]	43.2[ac]	24.1[a]	102[ac]	55.5[ac]	12.8	49.9[ac]	42.2[ac]	85.6[ac]
Lead (dissolved)	15	-	-	-	-	-	14.7	-	-	-	-	-	-	-

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-25*	*VAS-25*	*VAS-25*	*VAS-25*	*VAS-25*	*VAS-25*	*VAS-25*	*VAS-25*	*VAS-25*	*VAS-26*	*VAS-26*	*VAS-26*
Sample ID:			*GW-38443-120708-KMV-064*	*GW-38443-120708-KMV-065*	*GW-38443-120708-KMV-066*	*GW-38443-120708-KMV-067*	*GW-38443-120708-KMV-068*	*GW-38443-120708-KMV-069*	*GW-38443-120708-KMV-070*	*GW-38443-120808-KMV-071*	*GW-38443-120808-KMV-072*	*GW-38443-110409-DR-057*	*GW-38443-110409-DR-058*	*GW-38443-110409-DR-059*
Sample Date:			*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/2/2008*	*12/4/2008*	*12/4/2008*	*11/4/2009*	*11/4/2009*	*11/4/2009*
Sample Depth:			*55-60 ft BGS*	*60-65 ft BGS*	*65-70 ft BGS*	*70-75 ft BGS*	*75-80 ft BGS*	*80-85 ft BGS*	*85-90 ft BGS*	*90-95 ft BGS*	*95-100 ft BGS*	*26-31 ft BGS*	*26-31 ft BGS*	*31-36 ft BGS*
	USEPA Regional Screening Levels												*Duplicate*	
Parameter	*MCL a*	*TapWater b*												
Volatiles														
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	17 UJ	17 UJ	17 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
1,1-Dichloroethane	-	2.4	0.54 J	0.34 J	0.34 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 UJ	17 UJ	17 UJ
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	33 U	33 U	33 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	0.57 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	170 U	170 U	170 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	170 U	170 U	170 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	170 U	170 U	170 U
Acetone	-	22000	1.4 J	1.3 J	1.3 J	10 UJ	10 U	10 U	10 U	10 U	10 U	170 U	170 U	170 U
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	0.53 J[b]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.9 J[ab]	5.9 J[ab]	6.2 J[ab]
Bromodichloromethane	-	0.12	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 UJ	17 UJ	17 UJ
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 UJ	17 UJ	17 UJ
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
[illegible]oroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 UJ	17 UJ	17 UJ
[illegible]oform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
[illegible]romethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
cis-1,2-Dichloroethene	70	370	7.2	27	27	1.8	0.89 J	0.42 J	0.37 J	0.26 J	0.26 J	17 U	17 U	17 U
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	17 UJ	17 UJ	17 UJ
Cyclohexane	-	13000	0.33 J	0.28 J	0.28 J	0.21 J	0.28 J	1.0 U	0.18 J	0.18 J	0.16 J	220	230	230
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 UJ	17 UJ	17 UJ
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	17 U	17 U	17 U
Ethylbenzene	700	1.5	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	350[ab]	320[ab]	350[ab]
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	67	66	70
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	170 U	170 U	170 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120	130	120
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	83 U	83 U	83 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
Tetrachloroethene	5	0.11	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	17 U	17 U	17 U
Toluene	1000	2300	0.54 J	0.42 J	0.45 J	0.38 J	0.42 J	0.23 J	0.30 J	0.29 J	0.28 J	10 J	9.8 J	11 J
trans-1,2-Dichloroethene	100	110	1.2	4.0	4.2	0.32 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
trans-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	17 UJ	17 UJ	17 UJ
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
Trifluorotrichloroethene (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	17 U	17 U	17 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	0.22 J[b]	0.22 J[b]	0.90 J[b]	0.26 J[b]	6.5[ab]	6.8[ab]	17 U	17 U	17 U
Xylene (total)	10000	200	2.0 UJ	2.0 UJ	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1200[ab]	1200[ab]	1300[ab]
Semi-Volatiles														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	-	-	-	1.0 U	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	-	-	-	5.0 U	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	-	-	-	5.0 U	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-	-	-	-	-	2.0 U	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-	-	-	-	-	2.0 U	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-	-	-	-	-	5.0 U	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	-	-	-	5.0 U	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-	-	-	-	-	5.0 U	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-	-	-	-	-	1.0 U	-	-	-
2-Chlorophenol	-	180	-	-	-	-	-	-	-	-	1.0 U	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-	-	-	-	-	0.20 U	-	-	-
2-Methylphenol	-	1800	-	-	-	-	-	-	-	-	1.0 U	-	-	-
2-Nitroaniline	-	370	-	-	-	-	-	-	-	-	2.0 U	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	2.0 U	-	-	-
[illegible]chlorobenzidine	-	0.15	-	-	-	-	-	-	-	-	5.0 U	-	-	-
[illegible]oaniline	-	-	-	-	-	-	-	-	-	-	2.0 U	-	-	-
[illegible]-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	-	-	-	5.0 U	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	2.0 U	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	-	-	-	2.0 U	-	-	-

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:	USEPA Regional Screening Levels		VAS-25	VAS-25	VAS-25	VAS-25	VAS-25	VAS-25	VAS-25	VAS-25	VAS-25	VAS-26	VAS-26	VAS-26
Sample ID:			GW-38443-120708-KMV-064	GW-38443-120708-KMV-065	GW-38443-120708-KMV-066	GW-38443-120708-KMV-067	GW-38443-120708-KMV-068	GW-38443-120708-KMV-069	GW-38443-120708-KMV-070	GW-38443-120808-KMV-071	GW-38443-120808-KMV-072	GW-38443-110409-DR-057	GW-38443-110409-DR-058	GW-38443-110409-DR-059
Sample Date:			12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/3/2008	12/8/2008	12/8/2008	11/4/2009	11/4/2009	11/4/2009
Sample Depth:			55-60 ft BGS	60-65 ft BGS	65-70 ft BGS	70-75 ft BGS	75-80 ft BGS	80-85 ft BGS	85-90 ft BGS	90-95 ft BGS	95-100 ft BGS	26-31 ft BGS	26-31 ft BGS	31-36 ft BGS
													Duplicate	
Parameter	*MCL a*	*TapWater b*												
4-Chloroaniline	-	0.34	-	-	-	-	-	-	-	-	2.0 U	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	2.0 U	-	-	-
4-Methylphenol	-	180	-	-	-	-	-	-	-	-	1.0 U	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-	-	-	-	-	2.0 U	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	5.0 U	-	-	-
Acenaphthene	-	2200	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Acetophenone	-	3700	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Anthracene	-	11000	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Atrazine	3	0.29	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Benzaldehyde	-	3700	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	-	-	-	1.0 U	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	-	-	-	1.0 U	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	-	-	-	1.0 U	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	-	-	-	1.0 J	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Caprolactam	-	18000	-	-	-	-	-	-	-	-	5.0 UJ	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Chrysene	-	2.9	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Dibenzofuran	-	37	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Diethyl phthalate	-	29000	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Fluoranthene	-	1500	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Fluorene	-	1500	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	-	-	-	10 U	-	-	-
Hexachloroethane	-	4.8	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Isophorone	-	71	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Naphthalene	-	0.14	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Nitrobenzene	-	0.12	-	-	-	-	-	-	-	-	1.0 U	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	-	-	-	1.0 U	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-	-	-	-	-	5.0 U	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Phenol	-	11000	-	-	-	-	-	-	-	-	1.0 U	-	-	-
Pyrene	-	1100	-	-	-	-	-	-	-	-	0.20 U	-	-	-
Metals														
Arsenic	10	0.045	28.0[ab]	32.1[ab]	32.4[ab]	122[ab]	33.1[ab]	72.2[ab]	39.1[ab]	30.8[ab]	24.4[ab]	149[ab]	159[abc]	153[abc]
Arsenic (dissolved)	10	0.045	0.85 J[b]	-	-	-	-	-	6.4[b]	-	-	185[ab]	188[ab]	156[ab]
Lead	15	-	38.9[ac]	45.5[ac]	43.0[ac]	245[ac]	49.4[ac]	171[ac]	78.4[ac]	67.6[ac]	40.7[ac]	0.25 J	0.34 J	0.27 J
Lead (dissolved)	15	-	0.74 J	-	-	-	-	-	6.0	-	-	1.0 U	1.0 U	1.0 U

Notes:

All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected: The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*
Sample ID:			*GW-38443-110609-DR-060*	*GW-38443-110609-DR-061*	*GW-38443-110509-DR-062*	*GW-38443-110509-DR-063*	*GW-38443-110509-DR-064*	*GW-38443-110509-DR-065*	*GW-38443-110509-DR-066*	*GW-38443-110509-DR-067*	*GW-38443-110609-DR-069*	*GW-38443-110609-DR-070*	*GW-38443-110609-DR-071*	*GW-38443-110609-DR-072*	*GW-38443-110609-DR-073*
Sample Date:			*11/4/2009*	*11/4/2009*	*11/5/2009*	*11/5/2009*	*11/5/2009*	*11/5/2009*	*11/5/2009*	*11/5/2009*	*11/6/2009*	*11/6/2009*	*11/6/2009*	*11/6/2009*	*11/6/2009*
Sample Depth:			*36-41 ft BGS*	*41-46 ft BGS*	*46-51 ft BGS*	*51-56 ft BGS*	*56-61 ft BGS*	*61-66 ft BGS*	*66-71 ft BGS*	*71-76 ft BGS*	*76-81 ft BGS*	*81-86 ft BGS*	*86-91 ft BGS*	*86-91 ft BGS*	*91-96 ft BGS*
	USEPA Regional Screening Levels													*Duplicate*	
Parameter	*MCL a*	*TapWater b*													
Volatiles															
1,1,1-Trichloroethane	200	9100	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
1,1,2,2-Tetrachloroethane	-	0.067	120 UJ	120 UJ	120 U	120 U	50 U	50 U	12 U	17 U	29 UJ	25 UJ	10 UJ	10 UJ	6.7 UJ
1,1,2-Trichloroethane	5	0.24	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
1,1-Dichloroethane	-	2.4	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
1,1-Dichloroethene	7	340	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
1,2,4-Trichlorobenzene	70	2.3	120 UJ	120 UJ	120 U	120 U	50 U	50 U	12 U	17 U	29 UJ	25 UJ	10 UJ	10 UJ	6.7 UJ
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	250 U	250 U	250 U	250 U	100 U	100 U	25 U	33 U	57 U	50 U	20 U	20 U	13 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
1,2-Dichlorobenzene	600	370	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
1,2-Dichloroethane	5	0.15	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
1,2-Dichloropropane	5	0.39	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
1,3-Dichlorobenzene	-	-	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
1,4-Dichlorobenzene	75	0.43	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	1200 UJ	1200 U	1200 U	1200 U	500 U	500 U	120 U	170 U	290 U	250 U	100 U	100 U	67 U
2-Hexanone	-	47	1200 U	1200 U	1200 U	1200 U	500 U	500 U	120 U	170 U	290 U	250 U	100 U	100 U	67 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	1200 U	1200 U	1200 U	1200 U	500 U	500 U	120 U	170 U	290 U	250 U	100 U	100 U	67 U
Acetone	-	22000	1200 U	1200 U	1200 U	1200 U	500 U	500 U	120 U	170 U	290 U	250 U	100 U	100 U	67 U
Benzene	5	0.41	37 J[ab]	120 U	120 U	120 U	50 U	50 U	12 U	17 U	220[abc]	240[abc]	67[ab]	70[ab]	62[ab]
Bromodichloromethane	-	0.12	120 UJ	120 UJ	120 U	120 U	50 U	50 U	12 U	17 U	29 UJ	25 UJ	10 UJ	10 UJ	6.7 UJ
Bromoform	-	8.5	120 UJ	120 UJ	120 U	120 U	50 U	50 U	12 U	17 U	29 UJ	25 UJ	10 UJ	10 UJ	6.7 UJ
Bromomethane (Methyl bromide)	-	8.7	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
Carbon disulfide	-	1000	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
Carbon tetrachloride	5	0.2	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
Chlorobenzene	100	91	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
Chloroethane	-	21000	120 UJ	120 UJ	120 U	120 U	50 U	50 U	12 U	17 U	29 UJ	25 UJ	10 UJ	10 UJ	6.7 UJ
Chloroform (Trichloromethane)	-	0.19	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
Chloromethane (Methyl chloride)	-	190	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
cis-1,2-Dichloroethene	70	370	120 U	120 U	120 U	120 U	50 U	50 U	23	25	290[a]	340[a]	120[a]	140[a]	140[a]
cis-1,3-Dichloropropene	-	-	120 UJ	120 UJ	120 UJ	120 UJ	50 UJ	50 UJ	12 UJ	17 UJ	29 UJ	25 UJ	10 UJ	10 UJ	6.7 UJ
Cyclohexane	-	13000	620	610	410	500	390	350	64	93	250	200	57	58	45
Dibromochloromethane	-	0.15	120 UJ	120 UJ	120 U	120 U	50 U	50 U	12 U	17 U	29 UJ	25 UJ	10 UJ	10 UJ	6.7 UJ
Dichlorodifluoromethane (CFC-12)	-	390	120 U	120 U	120 UJ	120 UJ	50 UJ	50 UJ	12 UJ	17 UJ	29 U	25 U	10 U	10 U	6.7 U
Ethylbenzene	700	1.5	1900[abc]	1600[abc]	1600[abc]	1600[abc]	890[abc]	710[abc]	81[bc]	110[bc]	250[bc]	210[bc]	110[bc]	110[bc]	72[bc]
Isopropyl benzene	-	680	100 J	98 J	110 J	120	82	75	17	23	54	42	17	17	12
Methyl acetate	-	37000	1200 U	1200 U	1200 UJ	1200 UJ	500 UJ	500 UJ	120 UJ	170 UJ	290 U	250 U	100 U	100 U	67 U
Methyl cyclohexane	-	-	210	220	150	190	210	190	59	90	180	140	28	29	24
Methyl tert butyl ether (MTBE)	-	12	620 U	620 U	620 U	620 U	250 U	250 U	62 U	83 U	140 U	120 U	50 U	50 U	33 U
Methylene chloride	5	4.8	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
Styrene	100	1600	120 U	120 U	120 UJ	120 UJ	50 UJ	50 UJ	12 UJ	17 UJ	29 U	25 U	10 U	10 U	6.7 U
Tetrachloroethene	5	0.11	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
Toluene	1000	2300	320[a]	300[a]	86 J[a]	100 J[a]	29 J	25 J	3.3 J	3.0 J	5.5 J	4.8 J	3.3 J	3.4 J	2.4 J
trans-1,2-Dichloroethene	100	110	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
trans-1,3-Dichloropropene	-	-	120 UJ	120 UJ	120 UJ	120 UJ	50 UJ	50 UJ	12 UJ	17 UJ	29 UJ	25 UJ	10 UJ	10 UJ	6.7 UJ
Trichloroethene	5	2	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
Trichlorofluoromethane (CFC-11)	-	1300	120 U	120 U	120 UJ	120 UJ	50 UJ	50 UJ	12 UJ	17 UJ	29 U	25 U	10 U	10 U	6.7 U
Trifluorotrichloroethane (Freon 113)	-	59000	120 U	120 U	120 U	120 U	50 U	50 U	12 U	17 U	29 U	25 U	10 U	10 U	6.7 U
Vinyl chloride	2	0.016	120 UJ	120 U	120 U	120 U	50 U	50 U	14[ab]	12 J[ab]	77[ab]	83[ab]	96[ab]	100[ab]	110[ab]
Xylene (total)	10000	200	8100[bc]	7100[bc]	9400[bc]	9200[bc]	5100[bc]	4000[bc]	670[bc]	650[bc]	1400[bc]	1100[bc]	610[bc]	630[bc]	600[bc]
Semi-Volatiles															
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*
Sample ID:			*GW-38443-110409-DR-060*	*GW-38443-110409-DR-061*	*GW-38443-110509-DR-062*	*GW-38443-110509-DR-063*	*GW-38443-110509-DR-064*	*GW-38443-110509-DR-065*	*GW-38443-110509-DR-066*	*GW-38443-110509-DR-067*	*GW-38443-110609-DR-069*	*GW-38443-110609-DR-070*	*GW-38443-110609-DR-071*	*GW-38443-110609-DR-072*	*GW-38443-110609-DR-073*
Sample Date:			*11/4/2009*	*11/4/2009*	*11/5/2009*	*11/5/2009*	*11/5/2009*	*11/5/2009*	*11/5/2009*	*11/5/2009*	*11/6/2009*	*11/6/2009*	*11/6/2009*	*11/6/2009*	*11/6/2009*
Sample Depth:			*36-41 ft BGS*	*41-46 ft BGS*	*46-51 ft BGS*	*51-56 ft BGS*	*56-61 ft BGS*	*61-66 ft BGS*	*66-71 ft BGS*	*71-76 ft BGS*	*76-81 ft BGS*	*81-86 ft BGS*	*86-91 ft BGS*	*86-91 ft BGS*	*91-96 ft BGS*
	USEPA Regional Screening Levels													*Duplicate*	
Parameter	*MCL a*	*TapWater b*													
4-Chloroaniline	-	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Atrazine	3	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	-	18000	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	71	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1100	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals															
Arsenic	10	0.045	41.5[ab]	25.4[ab]	11.0[ab]	9.1[b]	2.7 J[b]	2.1 J[b]	81.7[ab]	35.6[ab]	108[ab]	92.8[ab]	4.2 J[b]	4.1 J[b]	4.1 J[b]
Arsenic (dissolved)	10	0.045	39.1[ab]	19.3[ab]	8.0[b]	9.2[b]	1.9 J[b]	1.7 J[b]	6.8[b]	3.3 J[b]	3.8 J[b]	4.0 J[b]	2.8 J[b]	2.9 J[b]	2.8 J[b]
Lead	15	-	2.1	1.9	13.9	3.7	3.0	1.6	103[ab]	46.6[ab]	252[ab]	179[ab]	3.1	3.2	2.6
Lead (dissolved)	15	-	0.69 J	0.65 J	0.47 J	0.38 J	0.33 J	0.22 J	4.0	0.22 J	0.46 J	2.2	1.0 U	1.0 U	1.0 U

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-27*
Sample ID:			*GW-38443-110609-DR-074*	*GW-38443-110609-DR-075*	*GW-38443-110609-DR-076*	*GW-38443-110909-DR-078*	*GW-38443-110909-DR-079*	*GW-38443-110909-DR-080*	*GW-38443-110909-DR-081*	*GW-38443-111009-DR-082*	*GW-38443-111009-DR-083*	*GW-38443-111009-DR-084*	*GW-38443-111009-DR-085*	*GW-38443-111109-DR-086*	*GW-38443-111109-DR-088*
Sample Date:			*11/6/2009*	*11/6/2009*	*11/6/2009*	*11/8/2009*	*11/9/2009*	*11/9/2009*	*11/9/2009*	*11/10/2009*	*11/10/2009*	*11/10/2009*	*11/10/2009*	*11/11/2009*	*11/11/2009*
Sample Depth:			*96-101 ft BGS*	*101-106 ft BGS*	*106-116 ft BGS*	*116-126 ft BGS*	*126-136 ft BGS*	*136-146 ft BGS*	*146-156 ft BGS*	*156-166 ft BGS*	*156-166 ft BGS*	*166-176 ft BGS*	*176-186 ft BGS*	*186-196 ft BGS*	*26-31 ft BGS*
	USEPA Regional Screening Levels										*Duplicate*				
Parameter	*MCL a*	*TapWater b*													
Volatiles															
1,1,1-Trichloroethane	200	9100	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	3.3 UJ	2.0 UJ	2.5 UJ	10 UJ	20 UJ	6.2 UJ	4.0 UJ	2.5 UJ	3.3 UJ	2.0 UJ	1.7 UJ	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	3.3 UJ	2.0 UJ	2.5 UJ	10 UJ	20 UJ	6.2 UJ	4.0 UJ	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	6.7 U	4.0 U	5.0 U	20 U	40 U	12 U	8.0 U	5.0 U	6.7 U	4.0 U	3.3 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	33 U	20 U	25 UJ	100 U	200 U	62 U	40 U	25 U	33 U	20 U	17 U	10 U	10 U
2-Hexanone	-	47	33 U	20 U	25 UJ	100 U	200 U	62 U	40 U	25 U	33 U	20 U	17 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	33 U	20 U	25 UJ	100 U	200 U	62 U	40 U	25 U	33 U	20 U	17 U	10 U	10 U
Acetone	-	22000	9.4 J	14 J	6.2 J	100 U	200 U	62 U	40 U	25 U	33 U	20 U	17 U	10 U	1.4 J
Benzene	5	0.41	14[ab]	15[ab]	51[ab]	250[abc]	360[abc]	27[ab]	3.1 J[b]	2.5 U	3.3 U	1.0 J[b]	0.69 J[b]	1.0[b]	0.84 J[b]
Bromodichloromethane	-	0.12	3.3 UJ	2.0 UJ	2.5 UJ	10 UJ	20 UJ	6.2 UJ	4.0 UJ	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Bromoform	-	8.5	3.3 UJ	2.0 UJ	2.5 UJ	10 U	20 U	6.2 U	4.0 U	2.5 UJ	3.3 UJ	2.0 UJ	1.7 UJ	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Carbon disulfide	-	1000	3.3 U	2.0 U	0.86 J	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Chlorobenzene	100	91	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Chloroethane	-	21000	3.3 UJ	2.0 UJ	2.5 UJ	10 UJ	20 UJ	6.2 UJ	4.0 UJ	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	0.65 J[b]
Chloromethane (Methyl chloride)	-	190	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	13	16	2.5 U	31	120[f]	12	1.8 J	2.5 U	3.3 U	1.0 J	0.88 J	0.34 J	0.26 J
cis-1,3-Dichloropropene	-	-	3.3 UJ	2.0 UJ	2.5 UJ	10 UJ	20 UJ	6.2 UJ	4.0 UJ	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Cyclohexane	-	13000	35	40	2.6	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	0.35 J	0.30 J	0.55 J	0.54 J
Dibromochloromethane	-	0.15	3.3 UJ	2.0 UJ	2.5 UJ	10 UJ	20 UJ	6.2 UJ	4.0 UJ	2.5 UJ	3.3 UJ	2.0 UJ	1.7 UJ	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	27[b]	19[b]	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	0.30 J	0.37 J
Isopropyl benzene	-	680	4.8	3.7	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Methyl acetate	-	37000	33 U	20 U	25 U	100 U	200 U	62 U	40 U	25 U	33 U	20 U	17 U	10 U	10 U
Methyl cyclohexane	-	-	10	10	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	0.53 J
Methyl tert butyl ether (MTBE)	-	12	17 U	10 U	12 U	50 U	100 U	31 U	20 U	12 U	17 U	10 U	8.4 U	5.0 U	5.0 U
Methylene chloride	5	4.8	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Styrene	100	1600	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Toluene	1000	2300	2.2 J	2.2	9.4	4.6 J	20 U	2.3 J	1.7 J	1.2 J	1.2 J	1.2 J	1.5 J	1.7	1.5
trans-1,2-Dichloroethene	100	110	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	3.3 UJ	2.0 UJ	2.5 UJ	10 UJ	20 UJ	6.2 UJ	4.0 UJ	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Trichloroethene	5	2	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	0.42 J
Trichlorofluoromethane (CFC-11)	-	1300	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	3.3 U	2.0 U	2.5 U	10 U	20 U	6.2 U	4.0 U	2.5 U	3.3 U	2.0 U	1.7 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	42[ab]	58[ab]	2.5 UJ	66[ab]	260[ab]	140[ab]	87[ab]	65[ab]	69[ab]	44[ab]	35[ab]	34 J[ab]	1.0 U
Xylene (total)	10000	200	160[f]	120[f]	2.9 J	20 U	40 U	12 U	8.0 U	5.0 U	6.7 U	4.0 U	3.3 U	0.95 J	0.80 J
Semi-Volatiles															
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-26*	*VAS-27*
Sample ID:			*GW-38443-110608-DR-074*	*GW-38443-110608-DR-075*	*GW-38443-110808-DR-076*	*GW-38443-110809-DR-078*	*GW-38443-110909-DR-079*	*GW-38443-110909-DR-080*	*GW-38443-110909-DR-081*	*GW-38443-111009-DR-082*	*GW-38443-111009-DR-083*	*GW-38443-111009-DR-084*	*GW-38443-111009-DR-085*	*GW-38443-111109-DR-086*	*GW-38443-111109-DR-088*
Sample Date:			*11/6/2009*	*11/6/2009*	*11/8/2009*	*11/8/2009*	*11/9/2009*	*11/9/2009*	*11/9/2009*	*11/10/2009*	*11/10/2009*	*11/10/2009*	*11/10/2009*	*11/11/2009*	*11/11/2009*
Sample Depth:			*96-101 ft BGS*	*101-106 ft BGS*	*106-116 ft BGS*	*116-126 ft BGS*	*126-136 ft BGS*	*136-146 ft BGS*	*146-156 ft BGS*	*156-166 ft BGS*	*156-166 ft BGS*	*166-176 ft BGS*	*176-186 ft BGS*	*186-196 ft BGS*	*26-31 ft BGS*
	USEPA Regional Screening Levels										*Duplicate*				
Parameter	*MCL a*	*TapWater b*													
4-Chloroaniline	-	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Atrazine	3	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	-	18000	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	71	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1100	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals															
Arsenic	10	0.045	4.8 J[b]	5.6[b]	1.2 J[b]	3.3 J[b]	1.5 J[b]	2.8 J[b]	9.0[b]	3.9 J[b]	3.9 J[b]	30.9[ab]	34.2[ab]	11.8[ab]	204[abc]
Arsenic (dissolved)	10	0.045	1.2 J[b]	0.89 J[b]	0.49 J[b]	0.64 J[b]	1.1 J[b]	0.57 J[b]	1.1 J[b]	1.8 J[b]	1.7 J[b]	1.7 J[b]	4.7 J[b]	2.0 J[b]	0.68 J[b]
Lead	15	-	7.7	8.9	1.0 U	5.5	0.61 J	3.6	38.3[ac]	9.4 J	9.9 J	66.2 J[ac]	42.6 J[ac]	13.7 U	189[ac]
Lead (dissolved)	15	-	0.38 J	0.42 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*
Sample ID:			*GW-38443-111108-DR-089*	*GW-38443-111208-DR-090*	*GW-38443-111609-DR-091*	*GW-38443-111609-DR-092*	*GW-38443-111709-DR-093*	*GW-38443-111709-DR-094*	*GW-38443-111709-DR-095*	*GW-38443-111709-DR-096*	*GW-38443-111909-DR-097*	*GW-38443-111909-DR-099*	*GW-38443-111909-DR-100*	*GW-38443-111909-DR-101*	*GW-38443-111909-DR-102*
Sample Date:			*11/11/2009*	*11/12/2009*	*11/16/2009*	*11/16/2009*	*11/17/2009*	*11/17/2009*	*11/17/2009*	*11/17/2009*	*11/18/2009*	*11/19/2009*	*11/19/2009*	*11/19/2009*	*11/19/2009*
Sample Depth:			*31-36 ft BGS*	*41-46 ft BGS*	*71-76 ft BGS*	*71-76 ft BGS*	*76-81 ft BGS*	*81-86 ft BGS*	*86-91 ft BGS*	*91-96 ft BGS*	*96-101 ft BGS*	*26-31 ft BGS*	*31-36 ft BGS*	*36-41 ft BGS*	*41-46 ft BGS*
	USEPA Regional Screening Levels					*Duplicate*									
Parameter	*MCL a*	*TapWater b*													
Volatiles															
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.057	1.0 U	1.0 UJ	9.1 UJ	9.1 UJ	7.1 UJ	12 UJ	11 UJ	17 UJ	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 UJ	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	0.36 J	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	0.88 J	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 UJ	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 UJ	18 U	18 U	14 U	25 U	22 U	33 U	5.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 UJ	91 U	91 U	71 U	120 U	110 U	170 U	25 U	10 UJ	10 UJ	10 UJ	10 UJ
2-Hexanone	-	47	10 U	10 UJ	91 U	91 U	71 U	120 U	110 U	170 UJ	25 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 U	10 UJ	91 U	91 U	71 U	120 U	110 U	170 UJ	25 U	10 UJ	10 UJ	10 UJ	10 UJ
Acetone	-	22000	10 U	10 U	91 U	91 U	71 U	120 U	110 U	170 U	25 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	0.35 J	1.0 U	1.0 U	0.29 J	0.28 J
Bromodichloromethane	-	0.12	1.0 U	1.0 UJ	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	0.38 J[b]	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	0.91 J[b]	0.38 J[b]	0.45 J[b]	0.47 J[b]	0.48 J[b]
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	0.65 J	0.38 J	9.1 U	9.1 U	710 J[a]	360 J[a]	330 J[a]	470 J[ab]	150[a]	1.0 U	1.0 U	1.1	0.72 J
cis-1,3-Dichloropropene	-	-	1.0 U	1.0 UJ	9.1 UJ	9.1 UJ	7.1 UJ	12 UJ	11 UJ	17 UJ	2.5 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	0.22 J	0.15 J	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	0.36 J	0.37 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 UJ	9.1 UJ	9.1 UJ	7.1 UJ	12 UJ	11 UJ	17 UJ	2.5 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	1.0 U	1.0 UJ	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	0.27 J	0.29 J
Isopropyl benzene	-	680	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 UJ	91 U	91 U	71 U	120 U	110 U	170 UJ	25 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	45 U	45 U	36 U	62 U	56 U	83 U	12 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 UJ	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	0.31 J[b]	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	1.0 U	6.7	9.1 U	9.1 U	3.5 J	9.0 J	12	4.9 J	5.6	0.87 J	1.0	13	12
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	9.1 U	9.1 U	1.4 J	12 U	2.1 J	17 U	0.83 J	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 UJ	9.1 UJ	9.1 UJ	7.1 UJ	12 UJ	11 UJ	17 UJ	2.5 UJ	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	2	0.61 J	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	0.30 J	0.28 J
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	9.1 U	9.1 U	7.1 U	12 U	11 U	17 U	2.5 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	230[ab]	250[ab]	180[ab]	140[ab]	75[ab]	82 UJ	32[ab]	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 UJ	18 U	18 U	14 U	25 U	22 U	33 U	5.0 U	2.0 U	2.0 U	0.69 J	0.71 J
Semi-Volatiles															
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-27*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*
Sample ID:			*GW-38443-111189-DR-089*	*GW-38443-111289-DR-090*	*GW-38443-111609-DR-091*	*GW-38443-111609-DR-092*	*GW-38443-111709-DR-093*	*GW-38443-111709-DR-094*	*GW-38443-111709-DR-095*	*GW-38443-111709-DR-096*	*GW-38443-111809-DR-097*	*GW-38443-111909-DR-099*	*GW-38443-111909-DR-100*	*GW-38443-111909-DR-101*	*GW-38443-111909-DR-102*
Sample Date:			*11/11/2009*	*11/12/2009*	*11/16/2009*	*11/16/2009*	*11/17/2009*	*11/17/2009*	*11/17/2009*	*11/17/2009*	*11/18/2009*	*11/19/2009*	*11/19/2009*	*11/19/2009*	*11/19/2009*
Sample Depth:			*31-36 ft BGS*	*41-46 ft BGS*	*71-76 ft BGS*	*71-76 ft BGS*	*76-81 ft BGS*	*81-86 ft BGS*	*86-91 ft BGS*	*91-96 ft BGS*	*96-101 ft BGS*	*26-31 ft BGS*	*31-36 ft BGS*	*36-41 ft BGS*	*41-46 ft BGS*
	USEPA Regional Screening Levels					*Duplicate*									
Parameter	*MCL a*	*TapWater b*													
4-Chloroaniline	-	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Atrazine	3	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	-	18000	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	71	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1100	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals															
Arsenic	10	0.045	4.6 J[b]	96.3[ab]	221[abc]	208[abc]	165[abc]	27.7[ab]	135[ab]	42.2[ab]	173[abc]	0.70 J[b]	2.9 J[b]	141[ab]	112[ab]
Arsenic (dissolved)	10	0.045	0.50 J[b]	10.7[ab]	8.5[b]	8.7[b]	6.9 J[b]	6.7 J[b]	3.2 J[b]	4.2 J[b]	1.2 J[b]	0.70 J[b]	0.86 J[b]	4.4 J[b]	0.66 J[b]
Lead	15	-	3.5 U	199[ac]	340[ac]	320[ac]	329[ac]	63.7[ac]	327[ac]	106[ac]	326[ac]	1.0 U	3.0	156[ac]	120[ac]
Lead (dissolved)	15	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.6	1.8	1.0 U	1.0 U	1.0 U	3.8	1.0 U

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*
Sample ID:			*GW-38443-111909-DR-103*	*GW-38443-111909-DR-104*	*GW-38443-112009-DR-105*	*GW-38443-112009-DR-106*	*GW-38443-112009-DR-107*	*GW-38443-112009-DR-109*	*GW-38443-112009-DR-110*	*GW-38443-112009-DR-111*	*GW-38443-112109-DR-112*	*GW-38443-112109-DR-113*	*GW-38443-112109-DR-114*	*GW-38443-112209-DR-115*	*GW-38443-112209-DR-116*
Sample Date:			*11/19/2009*	*11/19/2009*	*11/20/2009*	*11/20/2009*	*11/20/2009*	*11/20/2009*	*11/20/2009*	*11/20/2009*	*11/21/2009*	*11/21/2009*	*11/21/2009*	*11/22/2009*	*11/22/2009*
Sample Depth:			*76-81 ft BGS*	*81-86 ft BGS*	*86-91 ft BGS*	*91-96 ft BGS*	*91-96 ft BGS*	*96-101 ft BGS*	*101-106 ft BGS*	*106-116 ft BGS*	*116-126 ft BGS*	*126-136 ft BGS*	*136-146 ft BGS*	*146-156 ft BGS*	*156-166 ft BGS*
	USEPA Regional Screening Levels						*Duplicate*								
Parameter	*MCL a*	*TapWater b*													
Volatiles															
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00032	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
2-Hexanone	-	47	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 UJ	10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Acetone	-	22000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.41	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Bromoform	-	8.5	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloroform (Trichloromethane)	-	0.19	0.26 J[b]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.27 J[b]	1.0 U	1.0 U
Chloromethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	17	17	28	26	27	19	27	28	34	28	7.1	1.9	1.4
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	0.22 J	0.13 J	0.16 J	0.15 J	0.17 J	1.0 U	0.14 J	0.19 J	0.13 J	0.14 J	1.0 U	1.0 U	0.14 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Ethylbenzene	700	1.5	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	0.89 J	1.5	1.2 U	1.9 U	1.9 U	1.0 U	1.8 U	1.8 U	0.74 J	0.89 J	2.3	0.78 J	0.91 J
trans-1,2-Dichloroethene	100	110	0.50 J	0.49 J	0.69 J	0.63 J	0.62 J	0.33 J	0.35 J	0.83 J	1.7	0.91 J	0.26 J	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	0.44 J[b]	0.47 J[b]	0.81 J[b]	0.76 J[b]	0.73 J[b]	1.5[b]	2.5[ab]	0.47 J[b]	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
Semi-Volatiles															
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	-	0.15	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	-	3.7	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*
Sample ID:			*GW-38443-111909-DR-103*	*GW-38443-111909-DR-104*	*GW-38443-112009-DR-105*	*GW-38443-112009-DR-106*	*GW-38443-112009-DR-107*	*GW-38443-112009-DR-109*	*GW-38443-112009-DR-110*	*GW-38443-112009-DR-111*	*GW-38443-112109-DR-112*	*GW-38443-112109-DR-113*	*GW-38443-112109-DR-114*	*GW-38443-112209-DR-115*	*GW-38443-112209-DR-116*
Sample Date:			*11/19/2009*	*11/19/2009*	*11/20/2009*	*11/20/2009*	*11/20/2009*	*11/20/2009*	*11/20/2009*	*11/20/2009*	*11/21/2009*	*11/21/2009*	*11/21/2009*	*11/22/2009*	*11/22/2009*
Sample Depth:			*76-81 ft BGS*	*81-86 ft BGS*	*86-91 ft BGS*	*91-96 ft BGS*	*91-96 ft BGS*	*96-101 ft BGS*	*101-106 ft BGS*	*106-116 ft BGS*	*116-126 ft BGS*	*126-136 ft BGS*	*136-146 ft BGS*	*146-156 ft BGS*	*156-166 ft BGS*
	USEPA Regional Screening Levels						*Duplicate*								
Parameter	*MCL a*	*TapWater b*													
4-Chloroaniline	-	0.34	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acetophenone	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Atrazine	3	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzaldehyde	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-	-	-	-	-	-	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-	-	-	-	-	-	-	-	-	-
Caprolactam	-	18000	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	-	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-	-	-	-	-	-	-	-	-	-
Dibenzofuran	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorene	-	1500	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-	-	-	-	-	-	-	-	-	-
Isophorone	-	71	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	-	0.14	-	-	-	-	-	-	-	-	-	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenol	-	11000	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	-	1100	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals															
Arsenic	10	0.045	96.0^{ab}	24.1^{ab}	70.7^{ab}	46.4^{ab}	47.1^{ab}	165^{abc}	43.8^{ab}	98.8^{ab}	31.9^{ab}	66.4^{ab}	15.1^{ab}	10.9^{ab}	16.3^{ab}
Arsenic (dissolved)	10	0.045	$4.7\ J^{b}$	$4.8\ J^{b}$	5.0^{b}	5.5^{b}	$4.5\ J^{b}$	$3.0\ J^{b}$	$3.0\ J^{b}$	$3.3\ J^{b}$	$3.8\ J^{b}$	$4.0\ J^{b}$	$2.8\ J^{b}$	$1.7\ J^{b}$	$2.9\ J^{b}$
Lead	15	-	181^{ac}	33.1^{a}	158^{ac}	84.9^{ac}	62.6^{ac}	392^{ac}	87.9^{ac}	175^{ac}	59.2^{ac}	162^{ac}	26.8^{a}	16.7^{a}	30.5^{a}
Lead (dissolved)	15	-	1.2	0.21 J	1.5	2.9 J	1.3 J	0.25 J	1.0 U	2.8	0.49 J	2.7	0.59 J	1.0 U	0.56 J

Notes:

All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

-- Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*
Sample ID:			*GW-38443-112209-DR-117*	*GW-38443-112209-DR-118*	*GW-38443-112209-DR-119*	*GW-38443-112309-DR-120*
Sample Date:			*11/22/2009*	*11/22/2009*	*11/22/2009*	*11/23/2009*
Sample Depth:			*156-166 ft BGS*	*166-176 ft BGS*	*176-186 ft BGS*	*186-196 ft BGS*
	USEPA Regional Screening Levels		*Duplicate*			
Parameter	*MCL* *a*	*TapWater* *b*				
Volatiles						
1,1,1-Trichloroethane	200	9100	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	-	0.067	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2-Trichloroethane	5	0.24	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	-	2.4	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	7	340	1.0 U	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	70	2.3	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00052	2.0 U	2.0 U	2.0 U	2.0 U
1,2-Dibromoethane (Ethylene dibromide)	0.05	0.0065	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	600	370	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	5	0.15	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	5	0.39	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	-	-	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	75	0.43	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	7100	10 U	10 U	10 U	10 U
2-Hexanone	-	47	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	2000	10 UJ	10 UJ	10 UJ	10 UJ
Acetone	-	22000	10 U	10 U	10 U	10 U
Benzene	5	0.41	0.45 J[b]	0.75 J[b]	0.97 J[b]	0.88 J[b]
Bromodichloromethane	-	0.12	1.0 U	1.0 U	1.0 U	1.0 U
Bromoform	-	8.5	1.0 U	1.0 U	1.0 U	1.0 U
Bromomethane (Methyl bromide)	-	8.7	1.0 U	1.0 U	1.0 U	1.0 U
Carbon disulfide	-	1000	1.0 U	1.0 U	1.0 U	1.0 U
Carbon tetrachloride	5	0.2	1.0 U	1.0 U	1.0 U	1.0 U
Chlorobenzene	100	91	1.0 U	1.0 U	1.0 U	1.0 U
[illegible]loroethane	-	21000	1.0 U	1.0 U	1.0 U	1.0 U
[illegible]oform (Trichloromethane)	-	0.19	1.0 U	1.0 U	1.0 U	1.0 U
[illegible]romethane (Methyl chloride)	-	190	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	70	370	1.6	0.35 J	0.36 J	0.36 J
cis-1,3-Dichloropropene	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Cyclohexane	-	13000	1.0 U	0.26 J	0.38 J	0.26 J
Dibromochloromethane	-	0.15	1.0 U	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane (CFC-12)	-	390	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.5	1.0 U	1.0 U	0.26 J	1.0 U
Isopropyl benzene	-	680	1.0 U	1.0 U	1.0 U	1.0 U
Methyl acetate	-	37000	10 UJ	10 UJ	10 UJ	10 UJ
Methyl cyclohexane	-	-	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Methyl tert butyl ether (MTBE)	-	12	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	5	4.8	1.0 U	1.0 U	1.0 U	1.0 U
Styrene	100	1600	1.0 UJ	0.53 J	1.0 UJ	0.54 J
Tetrachloroethene	5	0.11	1.0 U	1.0 U	1.0 U	1.0 U
Toluene	1000	2300	0.73 J	1.4	1.7	1.1
trans-1,2-Dichloroethene	100	110	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	-	-	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	5	2	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	-	1300	1.0 U	1.0 U	1.0 U	1.0 U
Trifluorotrichloroethane (Freon 113)	-	59000	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	2	0.016	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (total)	10000	200	2.0 U	2.0 U	0.62 J	2.0 U
Semi-Volatiles						
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	-	0.32	-	-	-	-
2,4,5-Trichlorophenol	-	3700	-	-	-	-
2,4,6-Trichlorophenol	-	6.1	-	-	-	-
2,4-Dichlorophenol	-	110	-	-	-	-
2,4-Dimethylphenol	-	730	-	-	-	-
2,4-Dinitrophenol	-	73	-	-	-	-
2,4-Dinitrotoluene	-	0.22	-	-	-	-
2,6-Dinitrotoluene	-	37	-	-	-	-
2-Chloronaphthalene	-	2900	-	-	-	-
2-Chlorophenol	-	180	-	-	-	-
2-Methylnaphthalene	-	150	-	-	-	-
2-Methylphenol	-	1800	-	-	-	-
2-Nitroaniline	-	370	-	-	-	-
2-Nitrophenol	-	-	-	-	-	-
[illegible]ichlorobenzidine	-	0.15	-	-	-	-
[illegible]roaniline	-	-	-	-	-	-
[illegible]-Dinitro-2-methylphenol	-	3.7	-	-	-	-
4-Bromophenyl phenyl ether	-	-	-	-	-	-
4-Chloro-3-methylphenol	-	3700	-	-	-	-

TABLE A4.4b

SUMMARY OF VERTICAL AQUIFER SAMPLING ANALYTICAL RESULTS
2008 - 2009
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:			*VAS-28*	*VAS-28*	*VAS-28*	*VAS-28*
Sample ID:			*GW-38443-112209-DR-117*	*GW-38443-112209-DR-118*	*GW-38443-112209-DR-119*	*GW-38443-112209-DR-120*
Sample Date:			*11/22/2009*	*11/22/2009*	*11/22/2009*	*11/23/2009*
Sample Depth:			*156-166 ft BGS*	*166-176 ft BGS*	*176-186 ft BGS*	*186-196 ft BGS*
	USEPA Regional Screening Levels		*Duplicate*			
Parameter	*MCL a*	*TapWater b*				
4-Chloroaniline	-	0.34	-	-	-	-
4-Chlorophenyl phenyl ether	-	-	-	-	-	-
4-Methylphenol	-	180	-	-	-	-
4-Nitroaniline	-	3.4	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-
Acenaphthene	-	2200	-	-	-	-
Acenaphthylene	-	-	-	-	-	-
Acetophenone	-	3700	-	-	-	-
Anthracene	-	11000	-	-	-	-
Atrazine	3	0.29	-	-	-	-
Benzaldehyde	-	3700	-	-	-	-
Benzo(a)anthracene	-	0.029	-	-	-	-
Benzo(a)pyrene	0.2	0.0029	-	-	-	-
Benzo(b)fluoranthene	-	0.029	-	-	-	-
Benzo(g,h,i)perylene	-	-	-	-	-	-
Benzo(k)fluoranthene	-	0.29	-	-	-	-
Biphenyl (1,1-Biphenyl)	-	1800	-	-	-	-
bis(2-Chloroethoxy)methane	-	110	-	-	-	-
bis(2-Chloroethyl)ether	-	0.012	-	-	-	-
bis(2-Ethylhexyl)phthalate (DEHP)	6	4.8	-	-	-	-
Butyl benzylphthalate (BBP)	-	35	-	-	-	-
Caprolactam	-	18000	-	-	-	-
Carbazole	-	-	-	-	-	-
Chrysene	-	2.9	-	-	-	-
Dibenz(a,h)anthracene	-	0.0029	-	-	-	-
Dibenzofuran	-	37	-	-	-	-
Diethyl phthalate	-	29000	-	-	-	-
Dimethyl phthalate	-	-	-	-	-	-
Di-n-butylphthalate (DBP)	-	3700	-	-	-	-
Di-n-octyl phthalate (DnOP)	-	-	-	-	-	-
Fluoranthene	-	1500	-	-	-	-
Fluorene	-	1500	-	-	-	-
Hexachlorobenzene	1	0.042	-	-	-	-
Hexachlorobutadiene	-	0.86	-	-	-	-
Hexachlorocyclopentadiene	50	220	-	-	-	-
Hexachloroethane	-	4.8	-	-	-	-
Indeno(1,2,3-cd)pyrene	-	0.029	-	-	-	-
Isophorone	-	71	-	-	-	-
Naphthalene	-	0.14	-	-	-	-
Nitrobenzene	-	0.12	-	-	-	-
N-Nitrosodi-n-propylamine	-	0.0096	-	-	-	-
N-Nitrosodiphenylamine	-	14	-	-	-	-
Pentachlorophenol	1	0.56	-	-	-	-
Phenanthrene	-	-	-	-	-	-
Phenol	-	11000	-	-	-	-
Pyrene	-	1100	-	-	-	-
Metals						
Arsenic	10	0.045	17.8[ab]	87.8[ab]	47.8[ab]	61.3[ab]
Arsenic (dissolved)	10	0.045	3.0 J[b]	2.1 J[b]	1.6 J[b]	2.5 J[b]
Lead	15	-	32.2[a]	154[ab]	122[ab]	103[ab]
Lead (dissolved)	15	-	0.40 J	1.0 U	0.68 J	2.3

Notes:
All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

R - The parameter was rejected.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

UJ - The parameter was not detected. The associate numerical values is the estimated sample quantitation limit.

- - Not applicable.

[ ] - Concentration was greater than applicable criteria.

TABLE A4.5

FILTERED VERSUS UNFILTERED METAL CONCENTRATIONS IN VAS SAMPLES
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

			Parameter		Arsenic	Arsenic (Dissolved)	Lead	Lead (Dissolved)
		USEPA Regional Screening Levels	*MCL*	*a*	10	10	15	15
			TapWater	*b*	0.045	0.045	-	-
		Ecological Screening Value (1)		*c*	150	-	37	-
Sample Location:	*Sample ID:*	*Sample Date:*	*Sample Depth (ft BGS):*					
VAS-5	*GW-38443-121608-KMV-093*	*12/16/2008*	*55-60*		90.8[ab]	0.68 J[b]	75.6[ac]	1.0 U
VAS-5	*GW-38443-121708-KMV-100*	*12/17/2008*	*90-95*		29.6[ab]	3.9 J[b]	39.4[ac]	1.9
VAS-6	*GW-38443-010709-KMV-106*	*1/7/2009*	*55-60*		85.4[ab]	0.95 J[b]	104[ac]	1.0 U
VAS-7	*GW-38443-121908-KMV-104*	*12/19/2008*	*55-60*		22.2[ab]	2.5 J[b]	55.7[ac]	2.5
VAS-8	*GW-38443-010809-DD-219*	*1/8/2009*	*32-37*		132[ab]	4.5 J[b]	176[ac]	1.0 U
VAS-8	*GW-38443-011009-KMV-222*	*1/10/2009*	*62-67*		74.1[ab]	5.8[b]	164[ac]	1.0 U
VAS-11	*GW-38443-120908-DD-182*	*12/9/2008*	*67-72*		271[abc]	12.2[ab]	97.9[ac]	4.0
VAS-11	*GW-38443-120908-DD-188*	*12/9/2008*	*92-97*		157[abc]	1.3 J[b]	76.7[ac]	1.0 U
VAS-15	*GW-38443-120908-KMV-073*	*12/9/2008*	*30-35*		10.5[ab]	0.66 J[b]	6.3	0.20 J
VAS-15	*GW-38443-120908-KMV-082*	*12/9/2008*	*70-75*		53.4[ab]	2.0 J[b]	86.9[ac]	1.3
VAS-19	*GW-38443-121508-DD-192*	*12/15/2008*	*37-42*		52.6[ab]	3.2 J[b]	142[ac]	1.0 U
VAS-19	*GW-38443-121608-DD-197*	*12/16/2008*	*57-62*		25.4[ab]	3.0 J[b]	62.2[ac]	1.0 U
VAS-19	*GW-38443-121608-DD-202*	*12/16/2008*	*82-87*		29.5[ab]	4.4 J[b]	68.2[ac]	1.0 U
VAS-22	*GW-38443-121808-DD-208*	*12/18/2008*	*42-47*		174[abc]	6.3[b]	451[ac]	1.0 U
VAS-23	*GW-38443-120608-DD-172*	*12/6/2008*	*87-92*		47.9[ab]	4.3 J[b]	91.5[ac]	0.58 J
VAS-24	*GW-38443-010709-DD-214*	*1/7/2009*	*37-42*		52.2[ab]	18.9[ab]	43.2[ac]	14.7
VAS-25	*GW-38443-120708-KMV-064*	*12/7/2008*	*55-60*		28.0[ab]	0.85 J[b]	38.9[ac]	0.74 J
VAS-25	*GW-38443-120708-KMV-070*	*12/7/2008*	*85-90*		39.1[ab]	6.4[b]	78.4[ac]	6.0

Notes:

All concentrations are expressed in units of micrograms per litre (µg/L) unless otherwise noted.

J - The parameter was positively identified; however, the associated parameter concentration is estimated.

U - The parameter was not detected. The associated numerical value is the sample quantitation limit.

Concentration was greater than applicable criteria.

(1) - OMZA: Ohio River Basin Aquatic Life and Human Health Tier I Criteria and Tier II Values, Outside Mixing Zone Area OAC 3745-1-32, July 27, 2005.

TABLE A4.6

SUMMARY OF 2009 SOIL GAS FIELD SCREENING VALUES
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:	*GP01-09*	*GP01-09*	*GP01-09*	*GP02-09*	*GP02-09*	*GP02-09*	*GP03-09*	*GP03-09*	*GP03-09*	*GP04-09*	*GP04-09*	*GP04-09*
Sample Date:	18/09/2009	14/10/2009	10/12/2009	18/09/2009	14/10/2009	10/12/2009	18/09/2009	14/10/2009	10/12/2009	18/09/2009	14/10/2009	10/12/2009
Parameter												
Methane (%)	28.1	28.4	23.2	19.6	19.8	20.5	0	0	0	7.9	7.8	0.6
Carbon Dioxide (%)	16.5	14.3	11.2	14.2	14.9	16.0	8	5.5	0.8	0.2	0.1	0.1
Oxygen (%)	–	0	0	–	1.3	0	–	12.9	18.7	–	2.2	17.8
Lower Explosive Limit (%)	–	> 100	> 100	–	> 100	> 100	–	0	0	–	> 100	11
Manometer Pressure (inches H_2O)	–	-5.2	0	–	0	0	–	0	0	–	0	0
PID (ppm)	–	0	0	–	0	0	–	0	0	–	0	0
Barometric Pressure (in. Hg)	29.28	29.3	29.19	29.28	–	29.15	29.28	–	29.15	29.28	29.27	28.64
Balance (%)	–	57.2	65.6	–	63.9	63.5	–	82.2	80.5	–	9	81.5
Ambient Air Temperature (°F)	–	–	19	–	–	17	–	–	17	–	–	32

TABLE A4.6

SUMMARY OF 2009 SOIL GAS FIELD SCREENING VALUES
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:	*GP05-09*	*GP05-09*	*GP05-09*	*GP06-09*	*GP06-09*	*GP06-09*	*GP07-09*	*GP07-09*	*GP07-09*	*GP08-09*	*GP08-09*	*GP08-09*
Sample Date:	*18/09/2009*	*14/10/2009*	*10/12/2009*	*18/09/2009*	*14/10/2009*	*09/12/2009*	*18/09/2009*	*14/10/2009*	*09/12/2009*	*18/09/2009*	*14/10/2009*	*09/12/2009*
Parameter												
Methane (%)	0	0	0	0.1	0	0	0	0	0	0	0	0
Carbon Dioxide (%)	11	11.1	11.3	8.2	6.1	2.5	13.6	12.8	5.1	10.5	9.1	3.9
Oxygen (%)	–	5.3	3.2	–	10.1	16	–	4.4	13.9	–	7.8	16
Lower Explosive Limit (%)	–	0	0	–	0	0	–	0	0	–	0	0
Manometer Pressure (inches H_2O)	–	0	0	–	0	-1.1	–	0	0	–	0	0
PID (ppm)	–	0	0	–	0	0	–	0	0	–	0	0
Barometric Pressure (in. Hg)	29.28	29.27	29.15	29.28	29.27	28.58	29.28	29.27	28.58	29.28	29.27	28.58
Balance (%)	–	83.6	85.5	–	83.8	81.5	–	82.9	81	–	83	80.1
Ambient Air Temperature (°F)	–	–	17	–	–	35	–	–	35	–	–	35

TABLE A4.6

SUMMARY OF 2009 SOIL GAS FIELD SCREENING VALUES
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:	*GP09-09*	*GP09-09*	*GP09-09*	*GP10-09*	*GP10-09*	*GP10-09*	*GP11-09*	*GP11-09*	*GP12-09*	*GP12-09*	*GP12-09*
Sample Date:	*18/09/2009*	*14/10/2009*	*09/12/2009*	*18/09/2009*	*14/10/2009*	*09/12/2009*	*18/09/2009*	*09/12/2009*	*18/09/2009*	*14/10/2009*	*10/12/2009*
Parameter											
Methane (%)	0.1	0	0	0.1	0	0	0	0	0.1	0	0
Carbon Dioxide (%)	9.2	8.1	4.4	3.5	3.6	2.4	6.5	1.3	2	2.7	2
Oxygen (%)	–	12.1	13.5	–	0.4	8.3	–	17.8	–	17.9	15.8
Lower Explosive Limit (%)	–	0	0	–	0	0	–	0	–	0	0
Manometer Pressure (inches H_2O)	–	0	-0.4	–	-0.2	-2	–	0	–	0	0
PID (ppm)	–	0	0	–	0	0	–	0	–	0	0
Barometric Pressure (in. Hg)	29.28	29	28.64	29.28	29	28.64	29.28	28.64	29.31	29.27	29.15
Balance (%)	–	79.8	82.1	–	96	89.3	–	80.9	–	79.4	82.2
Ambient Air Temperature (°F)	–	–	35	–	–	35	–	32	–	–	17

TABLE A4.6

SUMMARY OF 2009 SOIL GAS FIELD SCREENING VALUES
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:	*GP13-09*	*GP13-09*	*GP13-09*	*GP14-09*	*GP14-09*	*GP14-09*	*GP15-09*	*GP15-09*	*GP15-09*	*GP16-09*	*GP16-09*	*GP16-09*
Sample Date:	*18/09/2009*	*14/10/2009*	*10/12/2009*	*18/09/2009*	*14/10/2009*	*10/12/2009*	*18/09/2009*	*14/10/2009*	*10/12/2009*	*18/09/2009*	*14/10/2009*	*10/12/2009*
Parameter												
Methane (%)	3.4	3.3	3.7	0	0	0	4.8	2	0	3.7	3.7	4.3
Carbon Dioxide (%)	10.5	10.1	9	9.1	7.2	4.1	8.8	8.5	7.7	5.3	5.3	5.1
Oxygen (%)	–	0.4	0.2	–	8.6	15.2	–	0.6	3.3	–	1	0
Lower Explosive Limit (%)	–	65	73	–	0	0	–	39	0	–	75	85
Manometer Pressure (inches H_2O)	–	0	0	–	-1	0	–	-1.4	0	–	-1.3	0
PID (ppm)	–	0	0	–	0	0	–	0	1.3	–	0	1.2
Barometric Pressure (in. Hg)	29.28	29.27	29.15	29.28	29.27	29.15	29.28	29.27	29.15	29.28	29.27	29.15
Balance (%)	–	86.3	87.1	–	84.3	80.7	–	89	89	–	90.1	90.6
Ambient Air Temperature (°F)	–	–	17	–	–	17	–	–	17	–	–	17

TABLE A4.6

SUMMARY OF 2009 SOIL GAS FIELD SCREENING VALUES
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:	*GP17-09*	*GP17-09*	*GP17-09*	*GP18-09*	*GP18-09*	*GP18-09*	*GP19-09*	*GP19-09*	*GP19-09*	*GP20-09*	*GP20-09*	*GP20-09*	*GP21-09*	*GP21-09*	*GP21-09*
Sample Date:	*18/09/2009*	*14/10/2009*	*10/12/2009*	*18/09/2009*	*14/10/2009*	*10/12/2009*	*18/09/2009*	*14/10/2009*	*10/12/2009*	*18/09/2009*	*14/10/2009*	*10/12/2009*	*18/09/2009*	*14/10/2009*	*09/12/2009*
Parameter															
Methane (%)	1.3	1.7	0.1	26.6	23.1	20.6	0.4	0.2	0.5	0	0	0	7.1	7.8	2.6
Carbon Dioxide (%)	11.9	9.4	5.4	5.1	5.2	4.5	12.2	13.5	11.7	16.9	14.1	11.9	1.6	1.2	0.3
Oxygen (%)	–	0	9.8	–	0	0	–	1	2	–	3.1	5	–	0.6	14.1
Lower Explosive Limit (%)	–	34	1	–	> 100	> 100	–	5	10	–	0	0	–	> 100	51
Manometer Pressure (inches H_2O)	–	0.2	0	–	0	0	–	0.2	0	–	0	0	–	0	0
PID (ppm)	–	0	56	–	0	0.7	–	0	3.2	–	0	1.1	–	0	0
Barometric Pressure (in. Hg)	29.28	29.3	29.19	29.28	29.3	29.19	29.28	29.27	29.19	29.28	29.27	29.19	29.28	29.27	28.64
Balance (%)	–	88.8	84.7	–	71.6	74.9	–	85.1	85.8	–	82.8	83.1	–	90	83
Ambient Air Temperature (°F)	–	–	19	–	–	19	–	–	21	–	–	21	–	–	32

TABLE A4.7

LANDFILL/SOIL GAS ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:						GP01-09	GP02-09	GP02-09	GP03-09	GP04-09	GP05-09	GP06-09	GP07-09	GP08-09	GP09-09	GP10-09	GP11-09
Sample ID:						A-038443-092909-NZ-022	A-038443-091509-NH-011	A-038443-091509-NH-012	A-038443-091509-GL-013	A-038443-091609-NH-015	A-038443-091509-GL-014	A-038443-091609-NH-019	A-038443-091609-GL-020	A-038443-091709-NH-021	A-038443-091509-NH-009	A-038443-091509-GL-010	A-038443-091609-NH-017
Sample Date:		OSWER Draft Guidance		OSWER Draft	USEPA Carcinogenic	9/29/2009	9/15/2009	9/15/2009	9/15/2009	9/16/2009	9/15/2009	9/16/2009	9/16/2009	9/17/2009	9/15/2009	9/15/2009	9/16/2009
								Duplicate									
Parameter	Units	Shallow Soil Gas[1] a	Deep Soil Gas[2] b	Guidance[1] a	Target Risk (TR) = 1E-06 c												
Volatiles																	
1,1,1-Trichloroethane	µg/m³	22000	220000	22000		110 U	11 U	11 UJ	73	1.9	10	1.6 U	55 U	0.93 J	18	14	2.3
1,1,2,2-Tetrachloroethane	µg/m³	42	420	42	0.211	140 U	14 U	14 UJ	2.1 U	2.1 U	2.1 U	2.1 U	70 U	2.1 U	2.1 U	2.1 U	2.1 U
1,1,2-Trichloroethane	µg/m³	150	1500	150	0.767	110 U	11 U	11 UJ	1.6 U	1.6 U	1.6 U	1.6 U	55 U	1.6 U	1.6 U	1.6 U	1.6 U
1,1-Dichloroethane	µg/m³	5000	50000	5000	7.67	80 U	8.1 U	8.1 UJ	10[d]	56[d]	1.2 U	1.2 U	41 U	1.2 U	1.2 U	2.1	1.2 U
1,1-Dichloroethene	µg/m³	2000	20000	2000		78 U	7.9 U	7.9 UJ	0.79 U	1.5	0.79 U	0.79 U	40 U	0.79 U	0.79 U	0.79 U	0.79 U
1,2,4-Trichlorobenzene	µg/m³	2000	20000	2000		370 U	37 U	37 UJ	5.9 U	5.9 U	5.9 U	5.9 U	190 U	5.9 U	5.9 U	5.9 U	5.9 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/m³	2	20	2	0.00204	190 U	97 UJ	97 UJ	9.7 UJ	9.7 UJ	9.7 UJ	9.7 UJ	490 UJ	9.7 UJ	9.7 UJ	9.7 UJ	9.7 UJ
1,2-Dibromoethane (Ethylene dibromide)	µg/m³	2	20	2	0.0204	150 U	15 U	15 UJ	3.1 U	3.1 U	3.1 U	3.1 U	78 U	3.1 U	3.1 U	3.1 U	3.1 U
1,2-Dichlorobenzene	µg/m³	2000	20000	2000		120 U	12 U	12 UJ	2.4 U	2.4 U	2.4 U	2.4 U	61 U	2.4 U	2.4 U	2.4 U	2.4 U
1,2-Dichloroethane	µg/m³	94	940	94	0.472	120 U	12 U	12 UJ	0.81 U	0.81 U	0.81 U	0.81 U	62 U	0.81 U	0.81 U	0.81 U	0.81 U
1,2-Dichloropropane	µg/m³	40	400	40	1.23	140 U	14 U	14 UJ	0.92 U	0.92 U	0.92 U	0.92 U	70 U	0.92 U	0.92 U	0.92 U	0.92 U
1,3-Dichlorobenzene	µg/m³	1100	11000	1100		240 U	24 U	24 UJ	2.4 U	10	6.4	2.4 U	120 U	2.0 J	2.4 U	2.4 U	8.8
1,4-Dichlorobenzene	µg/m³	8000	80000	8000	1.11	240 U	24 U	24 UJ	1.9 J[d]	1.3 J[d]	2.4 U	2.4 U	120 U	2.4 U	2.4 U	2.4 U	2.4 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m³	10000	100000	10000		290 U	29 U	29 UJ	3.7	4.6	3.0	2.9 U	150 U	1.9 J	1.5 J	3.2	2.3 J
2-Hexanone	µg/m³	NV	NV	NV		400 U	41 U	41 UJ	2.0 U	2.0 U	2.0 U	2.0 U	210 U	2.0 U	2.0 U	2.0 U	2.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m³	800	8000	800		400 U	41 U	41 UJ	1.6 U	1.6 U	1.6 U	1.6 U	210 U	1.6 U	1.6 U	3.9 J	1.6 U
Acetone	µg/m³	3500	35000	3500		230 U	27 U	41 UJ	24 U	84 U	20 U	7.1 U	120 U	17 UJ	11 U	21 U	18 U
Benzene	µg/m³	310	3100	310	1.57	860[ef]	37[d]	36 J[d]	1.3	110[d]	0.83 J	0.96 U	49 U	1.8[d]	1.9[d]	1.7[d]	0.83 J
Bromodichloromethane	µg/m³	140	14000	140	0.331	130 U	13 U	13 UJ	2.0 U	2.0 U	2.0 U	2.0 U	68 U	2.0 U	2.0 U	2.0 U	2.0 U
Bromoform	µg/m³	2200	22000	2200	11.1	200 U	21 U	21 UJ	4.1 U	4.1 U	4.1 U	4.1 U	100 U	4.1 U	4.1 U	4.1 U	4.1 U
Bromomethane (Methyl bromide)	µg/m³	50	500	50		150 U	8.5 J	16 UJ	1.6 U	1.6 U	1.6 U	1.6 U	79 U	1.6 U	1.6 U	1.6 U	1.6 U
Carbon disulfide	µg/m³	7000	70000	7000		310 U	18 J	18 J	20	16	6.7	6.5	160 U	8.4	13	11	9.2
Carbon tetrachloride	µg/m³	160	1600	160	0.818	120 U	13 U	13 UJ	1.9 U	1.9 U	1.9 U	1.9 U	64 U	1.9 U	1.9 U	1.9 U	1.9 U
Chlorobenzene	µg/m³	600	6000	600		12000[a]	9.2 U	9.2 UJ	1.4 U	1.4 U	2.4	1.4 U	47 U	1.4 U	1.9	1.4 U	1.1 J
Chloroethane	µg/m³	100000	1000000	100000		100 U	4.8 J	4.5 J	1.1 U	12	1.1 U	1.1 U	53 U	1.1 U	1.1 U	1.1 U	1.1 U
Chloroform (Trichloromethane)	µg/m³	110	1100	110	0.533	96 U	9.8 U	9.8 UJ	13[d]	1.5 U	1.5 U	1.5 U	49 U	1.2 J[d]	14[d]	4.5[d]	1.5 U
Chloromethane (Methyl chloride)	µg/m³	900	9000	900		82 U	8.3 UJ	8.3 UJ	1.5 J	1.7 U	1.6 J	1.7 U	42 UJ	1.7 U	1.5 J	1.2 J	0.99 J
cis-1,2-Dichloroethene	µg/m³	350	3500	350		52 J	22	17 J	0.66 J	1.1	1.3	0.79 U	40 U	0.79 U	1.4	0.79 U	0.79 U
cis-1,3-Dichloropropene	µg/m³	200	2000	200		90 U	9.1 U	9.1 UJ	1.8 U	1.8 U	1.8 U	1.8 U	46 U	1.8 U	1.8 U	1.8 U	1.8 U
Cyclohexane	µg/m³	NV	NV	NV		1300	550	550 J	1.7 U	30	1.7 U	1.7 U	35 U	2.1	1.7 U	1.7 U	1.7 U
Dibromochloromethane	µg/m³	100	1000	100	0.454	170 U	17 U	17 UJ	3.4 U	3.4 U	3.4 U	3.4 U	86 U	3.4 U	3.4 U	3.4 U	3.4 U
Dichlorodifluoromethane (CFC-12)	µg/m³	2000	20000	2000		150 U	1400	1400 J	1.5 J	4.5	120	4.0	75 U	63	2.5	24	3.1
Ethylbenzene	µg/m³	2200	22000	2200	4.91	1100[d]	10[d]	16 J[d]	5.5[d]	110[d]	3.5	1.3 U	44 U	4.4	3.2	5.4[d]	3.0
Isopropyl benzene	µg/m³	4000	40000	4000		260	9.8 U	9.8 UJ	2.5 U	12	2.5 U	2.5 U	50 U	2.5 U	2.5 U	2.5 U	2.5 U
Methyl tert butyl ether (MTBE)	µg/m³	30000	300000	30000	47.2	71 U	7.2 U	7.2 UJ	3.6 U	3.6 U	3.6 U	3.6 U	37 U	3.6 U	3.6 U	1.4 J	3.6 U
Methylene chloride	µg/m³	5200	52000	5200	26.1	59 J[d]	6.9 U	6.9 UJ	0.99 J	1.0 U	6.5	1.0 U	19 J	0.55 J	1.0 U	1.0 U	0.78 J
Naphthalene	µg/m³	30	300	30	0.361	310 U	31 U	31 UJ	2.2 J[d]	2.6 U	2.6 U	2.6 U	160 U	2.6 U	8.8[d]	7.9[d]	2.6 U
Styrene	µg/m³	10000	100000	10000		84 U	8.5 U	8.5 UJ	1.7 U	1.7 U	1.7 U	1.7 U	43 U	1.7 U	1.7 U	1.7 U	1.7 U
Tetrachloroethene	µg/m³	810	8100	810	2.08	130 U	14 U	14 UJ	610[d]	2.7 U	13[d]	1.5 J	69 U	25[d]	120[d]	40[d]	2.7 U
Toluene	µg/m³	4000	40000	4000		130	23	18 J	12	680	9.3	1.1 U	27 J	22	12	18	11
trans-1,2-Dichloroethene	µg/m³	700	7000	700		78 U	7.9 U	7.9 UJ	0.79 U	0.79 U	0.79 U	0.79 U	40 U	0.79 U	0.79 U	0.79 U	0.79 U
trans-1,3-Dichloropropene	µg/m³	200	2000	200		90 U	9.1 U	9.1 UJ	1.8 U	1.8 U	1.8 U	1.8 U	46 UJ	1.8 U	1.8 U	1.8 U	1.8 U
Trichloroethene	µg/m³	22	220	22	6.13	110 U	12[d]	11 UJ	190[ef]	4.4	15[d]	1.0 J	54 U	1.6 J	2000[ef]	40[ef]	3.8
Trichlorofluoromethane (CFC-11)	µg/m³	7000	70000	7000		110 U	11 U	11 UJ	5.8	2.2 U	5.4	8.8	40 J	74	5.2	5.2	4.4
Trifluorotrichloroethane (Freon 113)	µg/m³	300000	3000000	300000		150 U	15 U	15 UJ	3.8 U	3.8 U	3.8 U	3.8 U	78 U	3.8 U	3.8 U	3.8 U	3.8 U
Vinyl chloride	µg/m³	280	2800	280	2.79	760[ef]	100[d]	100 J[d]	0.51 U	14 J[d]	0.51 U	0.51 U	52 U	0.51 U	0.51 U	0.51 U	0.51 U
Xylene (total)	µg/m³	70000	700000	70000		160	62	67 J	25	480	19	1.3 U	44 U	13	19	30	14

Notes:
All concentrations are expressed in units of micrograms per cubic metre (µg/m³) unless otherwise noted.

J - Estimated.
U - Non-detect at associated value.
UJ - Estimated reporting limit.
NV - No value.
Criteria Notes:
1 - Target Shallow Soil Gas Concentrations Corresponding to Target Indoor Air Concentrations where the Soil Gas to Indoor Air Attenuation Factor = 0.1 in Table 2a (Risk = 1 x 10-4) of draft guidance "Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils" (USEPA, 2002).
2 - Target Deep Soil Gas Concentration Corresponding to Target Indoor Air Concentration where the Soil Gas to Indoor Air Attenuation Factor = 0.01 (Risk = 1 x 10-5) of draft guidance "Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils" (USEPA, 2002).

TABLE A4.7

LANDFILL/SOIL GAS ANALYTICAL RESULTS SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sample Location:						GP12-09	GP13-09	GP14-09	GP15-09	GP16-09	GP17-09	GP18-09	GP19-09	GP20-09	GP20-09	GP26-09	GP21-09
Sample ID:						A-038443-091609-GL-018	A-038443-090409-NZ-001	A-038443-091109-NZ-002	A-038443-091109-NH-003	A-038443-091409-GL-008	A-038443-091109-NZ-004	A-038443-091109-NH-005	A-038443-091409-GL-006	A-038443-091409-NH-007	A-38443-012910-NZ-023	A-38443-012910-NZ-024	A-038443-091609-GL-016
Sample Date:						9/16/2009	9/4/2009	9/11/2009	9/11/2009	9/14/2009	9/11/2009	9/11/2009	9/14/2009	9/14/2009	1-29-10	1-29-10	9/16/2009
Parameter	Units	OSWER Draft Guidance Shallow Soil Gas[1] a	OSWER Draft Guidance Deep Soil Gas[2] b	OSWER Draft Guidance[1] a	USEPA Carcinogenic Target Risk (TR) = 1E-06 c												
Volatiles																	
1,1,1-Trichloroethane	µg/m³	22000	220000	22000		21	33 U	7.9 U	22 U	11 U	22	550 U	9.9 U	570 U	220 U	220 U	1.6 U
1,1,2,2-Tetrachloroethane	µg/m³	42	420	42	0.211	2.1 U	41 U	9.9 U	28 U	14 U	6.2 U	700 U	12 U	720 U	280 U	280 U	2.1 U
1,1,2-Trichloroethane	µg/m³	150	1500	150	0.767	1.6 U	33 U	7.9 U	22 U	11 U	4.9 U	550 U	9.9 U	570 U	220 U	220 U	1.6 U
1,1-Dichloroethane	µg/m³	5000	50000	5000	7.67	1.2 U	2900[a]	8.2[a]	7200[a]	66[a]	360[a]	600 J[a]	7.4 U	420 U	160 U	160 U	6.2
1,1-Dichloroethene	µg/m³	2000	20000	2000		0.79 U	16 U	3.8 U	420	7.9 U	12	400 U	39	420 U	160 U	160 U	1.1
1,2,4-Trichlorobenzene	µg/m³	2000	20000	2000		5.9 U	120 U	29 U	75 U	37 U	18 U	1900 U	34 U	1900 U	760 U	750 U	5.9 U
1,2-Dibromo-3-chloropropane (DBCP)	µg/m³	2	20	2	0.00204	9.7 UJ	190 U	46 U	190 U	97 UJ	29 U	4900 UJ	88 UJ	5100 UJ	2000 U	2000 U	9.7 UJ
1,2-Dibromoethane (Ethylene dibromide)	µg/m³	2	20	2	0.0204	3.1 U	62 U	15 U	31 U	15 U	9.2 U	780 U	14 U	810 U	310 U	310 U	3.1 U
1,2-Dichlorobenzene	µg/m³	2000	20000	2000		2.4 U	48 U	12 U	24 U	12 U	7.2 U	610 U	11 U	630 U	240 U	240 U	2.4 U
1,2-Dichloroethane	µg/m³	94	940	94	0.472	0.81 U	16 U	3.9 U	24 U	12 U	2.4 U	610 U	11 U	640 U	250 U	160 U	0.81 U
1,2-Dichloropropane	µg/m³	40	400	40	1.23	0.92 U	19 U	4.4 U	28 U	14 U	2.8 U	700 U	13 U	730 U	280 U	280 U	0.92 U
1,3-Dichlorobenzene	µg/m³	1100	11000	1100		2.4 U	48 U	12 U	48 U	9.7 J	7.2 U	1200 U	22 U	1300 U	490 U	490 U	4.0
1,4-Dichlorobenzene	µg/m³	8000	80000	8000	1.11	2.4 U	48 U	12 U	48 U	24 U	7.2 U	1200 U	22 U	1300 U	490 U	490 U	2.4 U
2-Butanone (Methyl ethyl ketone) (MEK)	µg/m³	10000	100000	10000		2.9 U	59 U	14 U	59 U	29 U	5.9 J	1500 U	27 U	1500 U	600 U	600 U	1.9 J
2-Hexanone	µg/m³	NV	NV	NV		2.0 U	41 U	9.8 U	82 U	41 U	6.1 U	2100 U	37 U	2100 U	830 U	830 U	2.0 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/m³	800	8000	800		1.6 U	33 U	7.9 U	82 U	74	4.9 U	2100 U	37 U	2100 U	830 U	830 U	1.6 U
Acetone	µg/m³	3500	35000	3500		7.7 U	38 U	11 U	48 U	24 U	32 U	1200 U	22 U	1200 U	480 U	480 U	1.9 U
Benzene	µg/m³	310	3100	310	1.57	0.99	19 U	4.6 U	250[a]	18[a]	46[a]	14000[a]	16[a]	500 U	200 U	190 U	34[a]
Bromodichloromethane	µg/m³	140	14000	140	0.331	2.0 U	40 U	9.7 U	27 U	13 U	6.0 U	680 U	12 U	700 U	270 U	270 U	2.0 U
Bromoform	µg/m³	2200	22000	2200	11.1	4.1 U	83 U	20 U	42 U	21 U	12 U	1000 U	19 U	1100 U	420 U	420 U	4.1 U
Bromomethane (Methyl bromide)	µg/m³	50	500	50		1.6 U	31 U	7.5 U	31 U	16 U	4.6 U	790 U	8.2 J	810 U	320 U	310 U	1.6 U
Carbon disulfide	µg/m³	7000	70000	7000		19	63 U	15	63 U	8.2 J	14	1600 U	10 J	1600 U	630 U	630 U	10
Carbon tetrachloride	µg/m³	160	1600	160	0.818	1.9 U	38 U	9.1 U	25 U	13 U	5.6 U	640 U	11 U	660 U	260 U	250 U	1.9 U
Chlorobenzene	µg/m³	600	6000	600		1.4 U	28 U	6.6 U	18 U	9.2 U	2.4 J	470 U	8.4 U	480 U	190 U	190 U	1.4 U
Chloroethane	µg/m³	100000	1000000	100000		1.1 U	410	5.1 U	290	6.4 J	3.2 U	1400	8.1 J	550 U	210 U	210 U	1.7
Chloroform (Trichloromethane)	µg/m³	110	1100	110	0.533	1.5[a]	29 U	80[a]	20 U	150[a]	4.4 U	490 U	8.9 U	510 U	200 U	200 U	1.5 U
Chloromethane (Methyl chloride)	µg/m³	900	9000	900		0.85 J	33 U	7.9 U	17 U	8.3 UJ	4.9 U	420 UJ	7.5 UJ	430 UJ	170 U	170 U	1.7 U
cis-1,2-Dichloroethene	µg/m³	350	3500	350		3.2	16 U	8.6	6300[a]	4.4 J	20	340 J	1600[a]	16000[a]	4500[a]	4400[a]	30
cis-1,3-Dichloropropene	µg/m³	200	2000	200		1.8 U	36 U	8.7 U	18 U	9.1 U	5.4 U	460 U	8.3 U	480 U	180 U	180 U	1.8 U
Cyclohexane	µg/m³	NV	NV	NV		1.7 U	390	8.3 U	14 U	6.9 U	42	50000	330	360 U	140 U	140 U	38
Dibromochloromethane	µg/m³	100	1000	100	0.454	3.4 U	68 U	16 U	34 U	17 U	10 U	860 U	15 U	890 U	350 U	350 U	3.4 U
Dichlorodifluoromethane (CFC-12)	µg/m³	2000	20000	2000		4.7	43	4.8 J	23 J	35	5.9 U	750 U	13 U	780 U	300 U	300 U	1.2 J
Ethylbenzene	µg/m³	2200	22000	2200	4.91	3.1	26 U	6.3 U	17 U	6.6 J[a]	7.0[a]	48000[a]	9.1[a]	460 U	180 U	180 U	7.6[a]
Isopropyl benzene	µg/m³	4000	40000	4000		2.5 U	49 U	12 U	20 U	9.8 U	7.4 U	4100[a]	8.9 U	520 U	200 U	200 U	2.5 U
Methyl tert butyl ether (MTBE)	µg/m³	30000	300000	30000	47.2	3.6 U	72 U	17 U	38	5.5 J	11 U	370 U	6.6 U	380 U	150 U	150 U	3.6 U
Methylene chloride	µg/m³	5200	52000	5200	26.1	1.0 U	21 U	5.0 U	14 U	6.9 U	3.1 U	350 U	6.3 U	360 U	140 U	140 U	1.0 U
Naphthalene	µg/m³	30	300	30	0.361	2.0 J[a]	53 U	13 U	63 U	31 U	5.6 J[a]	980 J[a]	29 U	1600 U	640 U	640 U	1.8 J[a]
Styrene	µg/m³	10000	100000	10000		1.7 U	34 U	8.2 U	17 U	8.5 U	5.1 U	430 U	7.7 U	450 U	170 U	170 U	1.7 U
Tetrachloroethene	µg/m³	810	8100	810	2.08	32[a]	54 U	280[a]	27 U	14 U	48[a]	690 U	12 U	710 U	280 U	270 U	4.8[a]
Toluene	µg/m³	4000	40000	4000		7.9	13 J	5.7	42	12	23	2800	13	400 U	150 U	150 U	11
trans-1,2-Dichloroethene	µg/m³	700	7000	700		0.79 U	16 U	3.8 U	210	7.9 U	1.3 J	400 U	7.2 U	310 J	160 U	160 U	3.4
trans-1,3-Dichloropropene	µg/m³	200	2000	200		1.8 U	36 U	8.7 U	18 U	9.1 UJ	5.4 U	460 U	8.3 U	480 U	180 U	180 U	1.8 U
Trichloroethene	µg/m³	22	220	22	6.13	1200[a]	43 U	650[a]	790[a]	11 U	66[a]	540 U	360[a]	56000[a]	16000[a]	16000[a]	5.5
Trichlorofluoromethane (CFC-11)	µg/m³	7000	70000	7000		6.7	45 U	11 U	23 U	11 U	6.7 U	570 U	10 U	590 U	230 U	230 U	2.2 U
Trifluorotrichloroethane (Freon 113)	µg/m³	300000	3000000	300000		3.8 U	77 U	18 U	31 U	15 U	11 U	780 U	14 U	800 U	310 U	310 U	3.8 U
Vinyl chloride	µg/m³	280	2800	280	2.79	0.51 U	6800[a]	2.5 U	14000[a]	690[a]	870[a]	4800[a]	3800[a]	540 U	210 U	210 U	4.7 J[a]
Xylene (total)	µg/m³	70000	700000	70000		16	26 U	7.7	18	17	35	47000	29	460 U	180 U	180 U	27

Notes:
All concentrations are expressed in units of micrograms per cubic metre (µg/m³) unless otherwise noted.

J - Estimated.
U - Non-detect at associated value.
UJ - Estimated reporting limit.
NV - No value.
Criteria Notes:
1 - Target Shallow Soil Gas Concentrations Corresponding to Target Indoor Air Concentrations where the Soil Gas to Indoor Air Attenuation Factor = 0.1 in Table 2a (Risk = 1 x 10-4) of draft guidance "Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils" (USEPA, 2002).
2 - Target Deep Soil Gas Concentration Corresponding to Target Indoor Air Concentration where the Soil Gas to Indoor Air Attenuation Factor = 0.01 (Risk = 1 x 10-5) of draft guidance "Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils" (USEPA, 2002).

APPENDICES

B

APPENDIX B

RISK CALCULATION TABLES

LIST OF TABLES

TABLE B.1.1	HUMAN HEALTH CONCEPTUAL SITE MODEL
TABLE B.2.1	OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SOIL GAS
TABLE B.2.2	OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE SOIL
TABLE B.2.3	OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE AND SUBSURFACE SOILS
TABLE B.2.4	OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER
TABLE B.2.5	OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SEDIMENT
TABLE B.3.1	ESTIMATED AMBIENT AIR CONCENTRATION FROM ON-SITE SOIL GAS
TABLE B.3.2	CALCULATION OF SOIL GAS TO AMBIENT AIR VOLATILIZATION FACTORS (VF_{sgamb})
TABLE B.3.3	EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN SOIL GAS
TABLE B.3.4	EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
TABLE B.3.5	EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN SURFACE AND SUBSURFACE SOIL
TABLE B.3.6	EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN GROUNDWATER
TABLE B.3.7	EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN SEDIMENT
TABLE B.4.1	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR INDOOR AIR - CURRENT/ FUTURE ON/OFF-SITE INDUSTRIAL/ COMMERCIAL WORKER

LIST OF TABLES

TABLE B.4.2	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR AMBIENT AIR - CURRENT/ FUTURE ON-SITE TRESPASSER
TABLE B.4.3	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR AMBIENT AIR - CURRENT/ FUTURE ON/OFF-SITE INDUSTRIAL/ COMMERCIAL WORKER
TABLE B.4.4	CALCULATION OF SOIL GAS TO AMBIENT AIR CONCENTRATIONS FOR TRESPASSER AND INDUSTRIAL/COMMERCIAL WORKER INHALATION EXPOSURE
TABLE B.4.5	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR AMBIENT AIR - FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER
TABLE B.4.6	CALCULATION OF SOIL GAS TO AMBIENT AIR CONCENTRATIONS WITHIN AN EXCAVATION FOR CONSTRUCTION/ UTILITY WORKER INHALATION EXPOSURE
TABLE B.4.7	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SURFACE SOIL - CURRENT/ FUTURE ON-SITE TRESPASSER
TABLE B.4.8	DERIVATION OF VOLATILIZATION FACTOR (VF) FOR SURFACE SOIL - CURRENT/ FUTURE ON-SITE TRESPASSER INHALATION EXPOSURE
TABLE B.4.9	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SURFACE SOIL - CURRENT/ FUTURE ON-SITE INDUSTRIAL/ COMMERCIAL WORKER
TABLE B.4.10	DERIVATION OF VOLATILIZATION FACTOR (VF) FOR SURFACE SOIL - CURRENT/ FUTURE ON-SITE INDUSTRIAL/ COMMERCIAL WORKER INHALATION EXPOSURE
TABLE B.4.11	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SURFACE AND SUBSURFACE SOIL - FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER
TABLE B.4.12	DERIVATION OF PARTICULATE EMISSION FACTOR (PEF) FOR SOIL - FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER INHALATION EXPOSURE

LIST OF TABLES

TABLE B.4.13	DERIVATION OF VOLATILIZATION FACTOR (VF) FOR SOIL - FUTURE ON-SITE COMMERCIAL/ UTILITY WORKER INHALATION EXPOSURE
TABLE B.4.14	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SEDIMENT - CURRENT/ FUTURE ON-SITE TRESPASSER
TABLE B.4.15	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SEDIMENT - CURRENT/ FUTURE ON-SITE INDUSTRIAL/ COMMERCIAL WORKER
TABLE B.4.16	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SEDIMENT - FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER
TABLE B.4.17	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR INDOOR AIR - CURRENT/ FUTURE OFF-SITE RESIDENT
TABLE B.4.18	VALUES USED FOR DAILY INTAKE CALCULATIONS FOR GROUNDWATER - HOUSEHOLD USE - CURRENT/ FUTURE OFF-SITE RESIDENT
TABLE B.5.1	NON-CANCER TOXICITY DATA -- ORAL/DERMAL ROUTE OF EXPOSURE
TABLE B.5.2	NON-CANCER TOXICITY DATA -- INHALATION ROUTE OF EXPOSURE
TABLE B.6.1	CANCER TOXICITY DATA -- ORAL/DERMAL ROUTE OF EXPOSURE
TABLE B.6.2	CANCER TOXICITY DATA -- INHALATION ROUTE OF EXPOSURE
TABLE B.7.1.CT	CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON-SITE TRESPASSER - CENTRAL TENDENCY (CT)
TABLE B.7.1.RME	CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON-SITE TRESPASSER - REASONABLE MAXIMUM EXPOSURE (RME)
TABLE B.7.2.CT	CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON-SITE INDUSTRIAL/ COMMERCIAL WORKER - CENTRAL TENDENCY
TABLE B.7.2.RME	CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON-SITE INDUSTRIAL/ COMMERCIAL WORKER - REASONABLE MAXIMUM EXPOSURE

LIST OF TABLES

TABLE B.7.3.CT	CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER- CENTRAL TENDENCY
TABLE B.7.3.RME	CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER- REASONABLE MAXIMUM EXPOSURE
TABLE B.7.4.CT	CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF-SITE RESIDENT- CENTRAL TENDENCY
TABLE B.7.4.RME	CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF-SITE RESIDENT- REASONABLE MAXIMUM EXPOSURE
TABLE B.9.1.CT	SUMMARY OF CURRENT/ FUTURE ON-SITE TRESPASSER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN - CENTRAL TENDENCY
TABLE B.9.1.RME	SUMMARY OF CURRENT/ FUTURE ON-SITE TRESPASSER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN - REASONABLE MAXIMUM EXPOSURE
TABLE B.9.2.CT	SUMMARY OF CURRENT/ FUTURE ON-SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN - CENTRAL TENDENCY
TABLE B.9.2.RME	SUMMARY OF CURRENT/ FUTURE ON-SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN - REASONABLE MAXIMUM EXPOSURE
TABLE B.9.3.CT	SUMMARY OF FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN - CENTRAL TENDENCY
TABLE B.9.3.RME	SUMMARY OF FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN - REASONABLE MAXIMUM EXPOSURE

LIST OF TABLES

TABLE B.9.4.CT	SUMMARY OF CURRENT/ FUTURE OFF-SITE RESIDENT RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN - CENTRAL TENDENCY
TABLE B.9.4.RME	SUMMARY OF CURRENT/ FUTURE OFF-SITE RESIDENT RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN - REASONABLE MAXIMUM EXPOSURE
TABLE B.10.1.RME	RISK ASSESSMENT SUMMARY FOR CURRENT/ FUTURE ON-SITE TRESPASSER - REASONABLE MAXIMUM EXPOSURE
TABLE B.10.2.RME	RISK ASSESSMENT SUMMARY FOR CURRENT/ FUTURE ON-SITE INDUSTRIAL/ COMMERCIAL WORKER - REASONABLE MAXIMUM EXPOSURE
TABLE B.10.3.RME	RISK ASSESSMENT SUMMARY FOR FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER - REASONABLE MAXIMUM EXPOSURE
TABLE B.10.4.RME	RISK ASSESSMENT SUMMARY FOR CURRENT/ FUTURE OFF-SITE RESIDENT - REASONABLE MAXIMUM EXPOSURE

TABLE B.1.1

HUMAN HEALTH CONCEPTUAL SITE MODEL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe	*Medium*	*Exposure Medium*	*Exposure Point*	*Receptor Population*	*Receptor Age*	*Exposure Route*	*on Site/ off Site*	*Type of Analysis*	*Rationale for Selection or Exclusion of Exposure Pathway*
Current/ Future:	Soil Gas	Ambient Air	Direct Contact	Trespasser	Adolescent	Inhalation of Vapors	on Site	Quant	Potential exposure to VOCs in ambient air while trespassing.
			Direct Contact	Industrial/ Commercial Worker	Adult	Inhalation of Vapors	on Site	Quant	Potential exposure to VOCs in ambient air while working.
		Indoor Air	Direct Contact	Industrial/ Commercial Worker	Adult	Inhalation of Vapors	on Site	Quant	Potential exposure to VOCs in indoor air while working.
	Surface Soil (0 to 2 ft bgs)	Surface Soil	Direct Contact	Trespasser	Adolescent	Ingestion Dermal Inhalation of Particulates/ Volatiles	on Site	Quant	Potential exposure to contaminated surface soil while trespassing.
			Direct Contact	Industrial/ Commercial Worker	Adult	Ingestion Dermal Inhalation of Particulates/ Volatiles	on Site	Quant	Potential exposure to contaminated surface soil while working.
	Sediment	Sediment	Direct Contact	Trespasser	Adolescent	Ingestion Dermal	on Site	Quant	Potential exposure to contaminated sediment while wading.
			Direct Contact	Industrial/ Commercial Worker	Adult	Ingestion Dermal	on Site	Quant	Potential exposure to contaminated sediment while working.
	Surface Water	Surface Water	Direct Contact	Trespasser	Adolescent	Ingestion Dermal Inhalaiton of Volatiles	on Site	Quant	Potential exposure to contaminated surface water while trespassing.
			Direct Contact	Industrial/ Commercial Worker	Adult	Ingestion Dermal Inhalation of Volatiles	on Site	Quant	Potential exposure to contaminated surface water while working.
	Soil Gas	Ambient Air	Direct Contact	Recreational User	Child & Adult	Inhalation of Vapors	off Site	Qual	Potential exposure to VOCs in ambient air while using the bike path.
			Direct Contact	Industrial/ Commercial Worker	Adult	Inhalation of Vapors	off Site	Qual	Potential exposure to VOCs in ambient air while working.
			Direct Contact	Resident	Child & Adult	Inhalation of Vapors	off Site	Qual	Potential exposure to VOCs in ambient air.
	Groundwater	Indoor Air	Direct Contact	Industrial/ Commercial Worker	Adult	Inhalation of Vapors	off Site	Quant	Potential exposure to VOCs in indoor air while working.
			Direct Contact	Resident	Child & Adult	Inhalation of Vapors	off Site	Quant	Potential exposure to VOCs in indoor air.
		Drinking Water	Direct Contact	Resident	Child & Adult	Ingestion Dermal Inhalation of Volatiles	off Site	Quant	Potential exposure to contaminated groundwater as a drinking water source.
Future:	Soil Gas	Ambient Air	Direct Contact	Construction/ Utility Worker	Adult	Inhalation of Vapors	on Site	Quant	Potential exposure to VOCs in ambient air during construction activities.
	Soil (0 to 15 ft bgs)	Soil	Direct Contact	Construction/ Utility Worker	Adult	Ingestion Dermal Inhalation of Particulates/ Volatiles	on Site	Quant	Potential exposure to contaminated soil during ground intrusive activities.
	Sediment	Sediment	Direct Contact	Construction/ Utility Worker	Adult	Ingestion Dermal	on Site	Quant	Potential exposure to contaminated sediment during ground intrusive activities.
	Surface Water	Surface Water	Direct Contact	Construction/ Utility Worker	Adult	Ingestion Dermal Inhalaiton of Volatiles	on Site	Quant	Potential exposure to contaminated surface water during ground intrusive activities

TABLE B.2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SOIL GAS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Soil Gas
Exposure Medium: Indoor Air/ Ambient Air

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	VOCs															
71-55-6	1,1,1-Trichloroethane	0.93	J	73		µg/m³	GP03-09 (09/15/09)	9/21	1.6 - 570	73	520	N	N/A	N/A		BSC
75-34-3	1,1-Dichloroethane	2.1		7200		µg/m³	GP15-09 (09/11/09)	10/21	1.2 - 420	7200	1.5	C	N/A	N/A	X	ASC
75-35-4	1,1-Dichloroethene	1.1		420		µg/m³	GP15-09 (09/11/09)	5/21	0.79 - 420	420	21	N	N/A	N/A	X	ASC
541-73-1	1,3-Dichlorobenzene	2	J	10		µg/m³	GP04-09 (09/16/09)	6/21	2.4 - 1300	10	21 (6)	N	N/A	N/A		BSC
106-46-7	1,4-Dichlorobenzene	1.3	J	1.9	J	µg/m³	GP03-09 (09/15/09)	2/21	2.4 - 1300	1.9	0.22	C	N/A	N/A	X	ASC
78-93-3	2-Butanone (MEK)	1.5	J	5.9	J	µg/m³	GP17-09 (09/11/09)	9/21	2.9 - 1500	5.9	520	N	N/A	N/A		BSC
108-10-1	4-Methyl-2-Pentanone (MIBK)	3.9	J	74		µg/m³	GP16-09 (09/14/09)	2/21	1.6 - 2100	74	310	N	N/A	N/A		BSC
71-43-2	Benzene	0.83	J	14000		µg/m³	GP18-09 (09/11/09)	16/21	0.96 - 500	14000	0.31	C	N/A	N/A	X	ASC
74-83-9	Bromomethane (Methyl Bromide)	8.2	J	8.5	J	µg/m³	GP02-09 (09/15/09)	2/21	1.6 - 810	8.5	0.52	N	N/A	N/A	X	ASC
75-15-0	Carbon disulfide	6.5		20		µg/m³	GP03-09 (09/15/09)	15/21	63 - 1600	20	73	N	N/A	N/A		BSC
108-90-7	Chlorobenzene	1.1	J	12000		µg/m³	GP01-09 (09/29/09)	5/21	1.4 - 480	12000	5.2	N	N/A	N/A	X	ASC
75-00-3	Chloroethane	1.7		1400		µg/m³	GP18-09 (09/11/09)	8/21	1.1 - 550	1400	1000	N	N/A	N/A	X	ASC
67-66-3	Chloroform (Trichloromethane)	1.2	J	150		µg/m³	GP16-09 (09/14/09)	7/21	1.5 - 510	150	0.11	C	N/A	N/A	X	ASC
74-87-3	Chloromethane (Methyl Chloride)	0.85	J	1.6	J	µg/m³	GP05-09 (09/15/09)	6/21	1.7 - 430	1.6	9.4	N	N/A	N/A		BSC
156-59-2	cis-1,2-Dichloroethene	0.66	J	16000		µg/m³	GP20-09 (09/14/09)	15/21	0.79 - 40	16000	--	--	N/A	N/A	X	AD
110-82-7	Cyclohexane	2.1		50000		µg/m³	GP18-09 (09/11/09)	9/21	1.7 - 360	50000	630	N	N/A	N/A	X	ASC
75-71-8	Dichlorodifluoromethane (CFC-12)	1.2	J	1400	J	µg/m³	GP02-09 (09/15/09)	15/21	5.9 - 780	1400	21	N	N/A	N/A	X	ASC
100-41-4	Ethylbenzene	3		48000		µg/m³	GP18-09 (09/11/09)	15/21	1.3 - 460	48000	0.97	C	N/A	N/A	X	ASC
98-82-8	Isopropylbenzene (cumene)	12		4100		µg/m³	GP18-09 (09/11/09)	3/21	2.5 - 520	4100	42	N	N/A	N/A	X	ASC
1634-04-4	Methyl Tert Butyl Ether	1.4	J	38		µg/m³	GP15-09 (09/11/09)	3/21	3.6 - 380	38	9.4	C	N/A	N/A	X	ASC
75-09-2	Methylene chloride	0.55	J	59	J	µg/m³	GP01-09 (09/29/09)	6/21	1 - 360	59	5.2	C	N/A	N/A	X	ASC
91-20-3	Naphthalene	1.8	J	980	J	µg/m³	GP18-09 (09/11/09)	7/21	2.6 - 1600	980	0.072	C	N/A	N/A	X	ASC
127-18-4	Tetrachloroethene	1.5	J	610		µg/m³	GP03-09 (09/15/09)	10/21	2.7 - 710	610	0.41	C	N/A	N/A	X	ASC
108-88-3	Toluene	5.7		2800		µg/m³	GP18-09 (09/11/09)	19/21	1.1 - 400	2800	520	N	N/A	N/A	X	ASC
156-60-5	trans-1,2-Dichloroethene	1.3	J	310	J	µg/m³	GP20-09 (09/14/09)	4/21	0.79 - 400	310	6.3	N	N/A	N/A	X	ASC
79-01-6	Trichloroethene	1	J	56000		µg/m³	GP20-09 (09/14/09)	16/21	11 - 540	56000	1.2	C	N/A	N/A	X	ASC
75-69-4	Trichlorofluoromethane (CFC-11)	4.4		74		µg/m³	GP08-09 (09/17/09)	9/21	2.2 - 590	74	73	N	N/A	N/A	X	ASC

TABLE B.2.1

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SOIL GAS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Soil Gas
Exposure Medium: Indoor Air/ Ambient Air

CAS Number	Chemical	Minimum Concentration (1,2)	Minimum Qualifier	Maximum Concentration (1,2)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	VOCs (cont'd)															
75-01-4	Vinyl chloride	4.7	J	14000		µg/m³	GP15-09 (09/11/09)	10/21	0.51 - 540	14000	0.16	C	N/A	N/A	X	ASC
1330-20-7	Xylenes (total)	7.7		47000		µg/m³	GP18-09 (09/11/09)	17/21	1.3 - 460	47000	10	N	N/A	N/A	X	ASC

Notes:

(1) Minimum/maximum detected concentration.

(2) Based on data collected from sampling locations: GP01-09, GO02-09, GP03-09, GP04-09, GP05-09, GP06-09, GP07-09, GP08-09, GP09-09, GP10-09, GP11-09, GP12-09, GP13-09, GP14-09, GP15-09, GP16-09, GP17-09, GP18-09, GP19-09, GP20-09, GP21-09.

(3) Maximum concentration is used for screening.

(4) Regional Screening Level Table (RSL) Master, April 2009, Residential Air Screening Levels.
Note: to account for multiple end points, non-carcinogens were adjusted by a factor of 10 (HI=0.1).

(5) Rationale Codes
Selection Reason: Maximum detected greater than Screening Criterion (ASC)
Analyte Detected (AD)
Deletion Reason: Maximum detected less than Screening Criterion (BSC)
Low Detection Frequency; less than or equal to 5% (LDF)
No Toxicity Data (NTX)

(6) No criterion available for this analyte therefore, substituted 1,2-dichlorobenzene screening level.

Definitions:

C = Carcinogenic
N = Non-Carcinogenic
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
-- = Not Available
N/A = Not Applicable
J = Estimated.
VOCs - Volatile Orgainc Compounds
µg/m³ - microgram per cubic meter

TABLE B.2.2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface Soil (0-2 ft bgs)
Exposure Medium: Surface Soil

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	VOCs															
540-59-0	1,2-Dichloroethene (total)	200		200		µg/kg	S8 (EPA); 0-1 ft bgs (10/23/90)	1/20	5 - 16	200	70000	N	N/A	N/A		BSC
78-93-3	2-Butanone (MEK)	1	J	4.7	J	µg/kg	TT-16; 2 ft bgs (09/30/08)	3/22	10 - 19	4.7	2800000	N	N/A	N/A		BSC
108-10-1	4-Methyl-2-Pentanone (MIBK)	36	J	36	J	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	1/22	10 - 19	36	530000	N	N/A	N/A		BSC
67-64-1	Acetone	3	J	25	J	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	3/22	5 - 19	25	6100000	N	N/A	N/A		BSC
75-09-2	Methylene chloride	16		16		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	1/11	4.7 - 17	16	11000	C	N/A	N/A		BSC
127-18-4	Tetrachloroethene	11		11		µg/kg	S8 (EPA); 0-1 ft bgs (10/23/90)	1/22	4.7 - 16	11	550	C	N/A	N/A		BSC
108-88-3	Toluene	2	J	10	J	µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	9/22	4.7 - 16	10	500000	N	N/A	N/A		BSC
79-01-6	Trichloroethene	4	J	4	J	µg/kg	S8 (EPA); 0-1 ft bgs (10/23/90)	1/22	4.7 - 16	4	2800	C	N/A	N/A		BSC
1330-20-7	Xylenes (total)	3	J	3	J	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	1/22	5 - 16	3	63000	N	N/A	N/A		BSC
	SVOCs															
91-57-6	2-Methylnaphthalene	46	J	1800		µg/kg	S1 (EPA); 1-2 ft bgs (10/23/90)	13/22	7.3 - 530	1800	31000	N	N/A	N/A		BSC
83-32-9	Acenaphthene	26	J	1200		µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	8/22	7.3 - 530	1200	340000	N	N/A	N/A		BSC
208-96-8	Acenaphthylene	50	J	87		µg/kg	TT-16; 2 ft bgs (09/30/08)	2/11	7.3 - 530	87	170000 (6)	N	N/A	N/A		BSC
120-12-7	Anthracene	26	J	3000		µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	10/22	7.3 - 530	3000	1700000	N	N/A	N/A		BSC
56-55-3	Benzo(a)anthracene	33		8500		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	16/22	330 - 530	8500	150	C	N/A	N/A	X	ASC
50-32-8	Benzo(a)pyrene	35		5700		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	15/22	330 - 530	5700	15	C	N/A	N/A	X	ASC
205-99-2	Benzo(b)fluoranthene	46		9500		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	16/22	330 - 530	9500	150	C	N/A	N/A	X	ASC
191-24-2	Benzo(g,h,i)perylene	22		4700		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	12/22	330 - 530	4700	170000 (6)	N	N/A	N/A		BSC
207-08-9	Benzo(k)fluoranthene	21		6400		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	11/22	330 - 530	6400	1500	C	N/A	N/A	X	ASC
117-81-7	bis(2-Ethylhexyl)phthalate	32	J	2100		µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	8/22	55 - 530	2100	35000	C	N/A	N/A		BSC
85-68-7	Butyl benzylphthalate	25	J	18000	E	µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	7/22	55 - 530	18000	260000	C	N/A	N/A		BSC
86-74-8	Carbazole	38	J	380	J	µg/kg	S07 (OEPA); 0-0.2 ft bgs (07/09/96)	4/11	55 - 530	380	--	--	N/A	N/A		NTX
218-01-9	Chrysene	21	J	6400	J	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	17/22	330 - 530	6400	15000	C	N/A	N/A		BSC
53-70-3	Dibenz(a,h)anthracene	110	J	1600		µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	7/22	7.3 - 530	1600	15	C	N/A	N/A	X	ASC
132-64-9	Dibenzofuran	28	J	830	J	µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	8/22	55 - 530	830	7800	N	N/A	N/A		BSC
84-74-2	Di-n-butylphthalate	18	J	1500		µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	8/22	55 - 410	1500	610000	N	N/A	N/A		BSC
117-84-0	Di-n-octylphthalate	19	J	23	J	µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	2/11	55 - 530	23	--	--	N/A	N/A		NTX
206-44-0	Fluoranthene	21	J	21000	D	µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	19/22	330 - 530	21000	230000	N	N/A	N/A		BSC
86-73-7	Fluorene	38	J	1500		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	7/22	7.3 - 530	1500	230000	N	N/A	N/A		BSC
193-39-5	Indeno(1,2,3-cd) pyrene	20		5000		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	14/22	330 - 530	5000	150	C	N/A	N/A	X	ASC
91-20-3	Naphthalene	20	J	1100		µg/kg	S1 (EPA); 1-2 ft bgs (10/23/90)	13/22	7.3 - 530	1100	3600	C	N/A	N/A		BSC
86-30-6	N-Nitrosodiphenylamine	27	J	450	J	µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	2/22	55 - 530	450	99000	C	N/A	N/A		BSC
85-01-8	Phenanthrene	26		16000	D	µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	19/22	330 - 530	16000	170000 (6)	N	N/A	N/A		BSC
108-95-2	Phenol	64	J	64	J	µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	1/11	55 - 530	64	1800000	N	N/A	N/A		BSC
129-00-0	Pyrene	20	J	13000		µg/kg	S6 (EPA); 0-1 ft bgs (10/23/90)	19/22	330 - 1300	13000	170000	N	N/A	N/A		BSC

TABLE B.2.2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface Soil (0-2 ft bgs)
Exposure Medium: Surface Soil

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	Metals															
7429-90-5	Aluminum	1140000		14300000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	22/22	–	14300000	7700000	N	N/A	N/A	X	ASC
7440-36-0	Antimony	700	J	278000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	10/22	680 - 7200	278000	3100	N	N/A	N/A	X	ASC
7440-38-2	Arsenic	1600	J	141000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	22/22	1200	141000	390	C	N/A	N/A	X	ASC
7440-39-3	Barium	7200	J	13000000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	22/22	–	13000000	1500000	N	N/A	N/A	X	ASC
7440-41-7	Beryllium	240	B	5800		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	20/22	250 - 1000	5800	16000	N	N/A	N/A		BSC
7440-43-9	Cadmium	290	B	16300		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	16/22	300 - 1000	16300	7000	N	N/A	N/A	X	ASC
7440-70-2	Calcium	979000	B	98000000		µg/kg	S11 (OEPA); 0.2-0.3 ft bgs (07/09/96)	22/22	–	98000000	–	–	N/A	N/A		NUT
7440-47-3	Chromium	6300		91700		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	22/22	–	91700	12000000	C	N/A	N/A		BSC
7440-48-4	Cobalt	1400	J	22100		µg/kg	S9 (EPA); 0-1 ft bgs (10/23/90)	21/22	10000	22100	2300	N	N/A	N/A	X	ASC
7440-50-8	Copper	12600		191000000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	191000000	310000	N	N/A	N/A	X	ASC
57-12-5	Cyanide	190	J	3700		µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	9/13	190 - 600	3700	160000	N	N/A	N/A		BSC
7439-89-6	Iron	2840000		92300000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	92300000	5500000	N	N/A	N/A	X	ASC
7439-92-1	Lead	7200		12100000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	12100000	400000	N	N/A	N/A	X	ASC
7439-95-4	Magnesium	294000	J	44300000		µg/kg	TT-16; 2 ft bgs (09/30/08)	22/22	–	44300000	–	–	N/A	N/A		NUT
7439-96-5	Manganese	7200		693000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	693000	180000	N	N/A	N/A	X	ASC
7439-97-6	Mercury	35	B	480		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	7/22	8 - 170	480	560	N	N/A	N/A		BSC
7440-02-0	Nickel	10700		402000		µg/kg	S8 (EPA); 0-1 ft bgs (10/23/90)	22/22	–	402000	150000	N	N/A	N/A	X	ASC
7440-09-7	Potassium	86000	J	1630000	J	µg/kg	S9 (EPA); 0-1 ft bgs (10/23/90)	22/22	–	1630000	–	–	N/A	N/A		NUT
7782-49-2	Selenium	910	J	8800		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	18/22	900 - 30000	8800	39000	N	N/A	N/A		BSC
7440-22-4	Silver	230	J	7600		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	5/22	210 - 2000	7600	39000	N	N/A	N/A		BSC
7740-23-5	Sodium	43700	J	809000	J	µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	21/22	550000	809000	–	–	N/A	N/A		NUT
18496-25-8	Sulfide	18600	J	26800	J	µg/kg	Roll-off Box (Boart Longyear VAS soil) (01/14/09)	2/2	–	26800	–	–	N/A	N/A		NTX
7440-28-0	Thallium	170		4500		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	11/22	140 - 2000	4500	–	N	N/A	N/A		NTX
7440-62-2	Vanadium	620	J	92600		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	22/22	–	92600	39000	N	N/A	N/A	X	ASC
7440-66-6	Zinc	9200		11500000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	22/22	–	11500000	2300000	N	N/A	N/A	X	ASC
	PCBs															
12672-29-6	Aroclor-1248 (PCB-1248)	360		4200		µg/kg	S2 (EPA); 0-1 ft bgs (10/23/90)	4/24	34 - 80	4200	220	C	N/A	N/A	X	ASC
11097-69-1	Aroclor-1254 (PCB-1254)	20	J	830		µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	3/13	34 - 53	830	220	C	N/A	N/A	X	ASC
11096-82-5	Aroclor-1260 (PCB-1260)	23	J	2800		µg/kg	S2 (EPA); 0-1 ft bgs (10/23/90)	9/24	34 - 160	2800	220	C	N/A	N/A	X	ASC
	Pesticides															
72-54-8	4,4'-DDD	0.65	J	4.4		µg/kg	S11 (OEPA); 0.2-0.3 ft bgs (07/09/96)	2/11	3.4 - 100	4.4	2000	C	N/A	N/A		BSC
72-55-9	4,4'-DDE	2.4	PJ	2.6	J	µg/kg	S04 (OEPA); 1.5-2 ft bgs (07/09/96)	2/11	3.4 - 100	2.6	1400	C	N/A	N/A		BSC
50-29-3	4,4'-DDT	1.6	PJ	8.8	P	µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	2/11	3.4 - 100	8.8	1700	C	N/A	N/A		BSC
319-84-6	alpha-BHC	0.71	PJ	0.71	PJ	µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	1/11	1.8 - 100	0.71	77	C	N/A	N/A		BSC
5103-71-9	alpha-Chlordane	5.4	PJ	5.4	P	µg/kg	S04 (OEPA); 1.5-2 ft bgs (07/09/96)	1/11	1.8 - 100	5.4	1600	C	N/A	N/A		BSC
959-98-8	Endosulfan I	0.42	PJ	0.42	PJ	µg/kg	S07 (OEPA); 0-0.2 ft bgs (07/09/96)	1/11	1.8 - 100	0.42	37000	N	N/A	N/A		BSC
33213-65-9	Endosulfan II	1.4	J	5.4		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	2/11	3.4 - 100	5.4	37000	N	N/A	N/A		BSC
72-20-8	Endrin	2.3	PJ	2.3	PJ	µg/kg	S03 (OEPA); 1.5-2 ft bgs (07/09/96)	1/11	3.4 - 100	2.3	1800	N	N/A	N/A		BSC
7421-93-4	Endrin aldehyde	6.4	P	6.6		µg/kg	S03 (OEPA); 1.5-2 ft bgs (07/09/96)	2/11	3.4 - 100	6.6	1800	N	N/A	N/A		BSC
53494-70-5	Endrin ketone	7.5	P	7.5	P	µg/kg	S11 (OEPA); 0.2-0.3 ft bgs (07/09/96)	1/11	3.4 - 100	7.5	1800	N	N/A	N/A		BSC
58-89-9	gamma-BHC (Lindane)	0.42	J	1.8	J	µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	3/11	1.8 - 100	1.8	520	C	N/A	N/A		BSC
5103-74-2	gamma-Chlordane	0.35	PJ	4.3		µg/kg	S04 (OEPA); 1.5-2 ft bgs (07/09/96)	4/11	1.8 - 100	4.3	1600	C	N/A	N/A		BSC
1024-57-3	Heptachlor epoxide	0.49	PJ	0.78	PJ	µg/kg	S04 (OEPA); 1.5-2 ft bgs (07/09/96)	2/11	1.8 - 100	0.78	53	C	N/A	N/A		BSC
72-43-5	Methoxychlor	1.8	PJ	1.8	PJ	µg/kg	S03 (OEPA); 1.5-2 ft bgs (07/09/96)	1/11	18 - 200	1.8	31000	N	N/A	N/A		BSC

TABLE B.2.2

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface Soil (0-2 ft bgs)
Exposure Medium: Surface Soil

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	Dioxins/Furans														
–	Total TBQ	0.8		12		pg/g	NE Former Air Curtain Destructor from AshPile (07/11/08)	2/2	–	12	4.5 C	N/A	N/A	X	ASC

Notes:

(1) Minimum/maximum detected concentration.

(2) Based on data collected from sampling locations: Centre Room of Trailer, Construction Debris Area, Desk Surface in Trailer, Exterior West Side of Trailer, Frame of Office Trailer, NE Former Air Curtain Destructor from AshPile, NW of MW101A (from AshPile), Paper Towel Dispenser Surface of Trailer, Roll-off Box (Boart Longyear VAS Soil), Right Side Tire of Mobile Office Trailer, Trailer Desk Surface, S1 (EPA), S2 (EPA), S3 (EPA), S4 (EPA), S5 (EPA), S6 (EPA), S7 (EPA), S8 (EPA), S9 (EPA), S10 (EPA), S11 (EPA), S02 (OEAP), S03 (OEPA), S04 (OEPA), S06 (OEPA), S07 (OEPA), S08 (OEPA), S09 (OEPA), S10 (OEPA), S11 (OEPA), TP-2, TT-16, TT-20.

(3) Maximum concentration is used for screening.

(4) Regional Screening Level Table (RSL) Master, December 2009, Residential Soil Screening Levels.
Note: to account for multiple end points, non-carcinogens were adjusted by a factor of 10 (HI=0.1).

(5) Rationale Codes
Selection Reason: Maximum detected above Screening Criterion (ASC)
Analyte Detected (AD)
Deletion Reason: Maximum detected below Screening Criterion (BSC)
Low Detection Frequency; less than to equal to 5% (LDF)
Essential Nutrient (NUT)
No Toxicity Data (NTX)

(6) No criterion available for this analyte therefore, substituted most conservative non-carcinogenic PAH (pyrene) screening level.

Definitions:
C = Carcinogenic
N = Non-Carcinogenic
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
-- = Not Available
N/A = Not Applicable
J = Estimated.
D = Compounds at secondary dilution factor.
E = Exceed calibration range of GC/MS instrument
B = Method blank contamination.
P = Difference for detected Aroclor > 25% between 2 GC column.
SVOCs - Semi Volatile Orgainc Compounds
VOCs - Volatile Orgainc Compounds
TBQ - Toxicity Equivalent
µg/kg - microgram per kilogram
PCBs - Polychlorinated biphenyls
pg/g - picogram per gram

TABLE B.2.3

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE AND SUBSURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface and Subsurface Soil (0-15 ft bgs)
Exposure Medium: Soil

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for (5) Contaminant Deletion or Selection
	VOCs															
71-55-6	1,1,1-Trichloroethane	2.1	J	2.7	J	µg/kg	TT-19; 7 ft bgs (10/07/08)	2/65	4 - 11000	2.7	870000	N	N/A	N/A		BSC
79-00-5	1,1,2-Trichloroethane	8.3		8.3		µg/kg	BH8-09; 3-5 ft bgs (06/20/09)	1/65	4 - 11000	8.3	1100	C	N/A	N/A		BSC
75-34-3	1,1-Dichloroethane	0.46	J	240	J	µg/kg	TT-9;7 ft bgs (10/03/08)	5/65	4 - 11000	240	3300	C	N/A	N/A		BSC
75-35-4	1,1-Dichloroethene	0.89	J	14		µg/kg	BH8-09; 3-5 ft bgs (06/20/09)	2/65	4 - 11000	14	24000	N	N/A	N/A		BSC
120-82-1	1,2,4-Trichlorobenzene	24	J	24	J	µg/kg	TP-5; 12 ft bgs (10/06/08)	1/61	4 - 11000	24	22000	N	N/A	N/A		BSC
95-50-1	1,2-Dichlorobenzene	42	J	47	J	µg/kg	TT-21; 8 ft bgs (10/08/08)	2/61	4 - 11000	47	190000	N	N/A	N/A		BSC
107-06-2	1,2-Dichloroethane	49		49		µg/kg	BH8-09; 3-5 ft bgs (06/20/09)	1/65	4 - 11000	49	430	C	N/A	N/A		BSC
540-59-0	1,2-Dichloroethene (total)	200		200		µg/kg	S8 (EPA); 0-1 ft bgs (10/23/90)	1/22	5 - 16	200	70000	N	N/A	N/A		BSC
541-73-1	1,3-Dichlorobenzene	2.4	J	44	J	µg/kg	TP-5; 12 ft bgs (10/06/08)	2/62	4 - 11000	44	190000 (6)	N	N/A	N/A		BSC
106-46-7	1,4-Dichlorobenzene	0.87	J	140	J	µg/kg	S01 (OEPA); 4-4.6 ft bgs (07/09/96)	12/65	4 - 11000	140	2400	C	N/A	N/A		BSC
78-93-3	2-Butanone (MEK)	1	J	1900		µg/kg	TP-3; 8.7 ft bgs (09/24/08)	12/76	10 - 46000	1900	2800000	N	N/A	N/A		BSC
108-10-1	4-Methyl-2-Pentanone (MIBK)	36	J	1000	J	µg/kg	TT-9; 7 ft bgs (10/03/08)	2/76	10 - 46000	1000	530000	N	N/A	N/A		BSC
67-64-1	Acetone	3	J	9600	J	µg/kg	TT-21; 7 ft bgs (10/08/08)	11/43	5 - 7100	9600	6100000	N	N/A	N/A		BSC
71-43-2	Benzene	1	J	12000		µg/kg	TT-21; 7 ft bgs (10/08/08)	10/65	4 - 1800	12000	1100	C	N/A	N/A	X	ASC
75-15-0	Carbon disulfide	0.83	J	6.4	J	µg/kg	TP-6; 11 ft bgs (10/06/08)	2/65	4 - 11000	6.4	82000	N	N/A	N/A		BSC
108-91-7	Chlorobenzene	3.3	J	47000		µg/kg	TT-7; 6 ft bgs (10/07/08)	8/65	4 - 1800	47000	29000	N	N/A	N/A		BSC
75-00-3	Chloroethane	4.3		4.3		µg/kg	TT-8; 4 ft bgs (10/06/08)	1/65	4 - 11000	4.3	1500000	N	N/A	N/A		BSC
67-66-3	Chloroform (Trichloromethane)	0.66	J	0.66	J	µg/kg	TT-3; 10 ft bgs (09/29/08)	1/65	4 - 11000	0.66	290	C	N/A	N/A		BSC
156-59-2	cis-1,2-Dichloroethene	0.63	J	890		µg/kg	TT-9; 7 ft bgs (10/03/08)	7/54	4 - 11000	890	78000	N	N/A	N/A		BSC
110-82-7	Cyclohexane	0.74	J	9800	J	µg/kg	TT-21; 7 ft bgs (10/08/08)	6/55	7.9 - 3600	9800	700000	N	N/A	N/A		BSC
100-41-4	Ethylbenzene	25	J	170000		µg/kg	TT-21; 7 ft bgs (10/08/08)	8/65	4 - 290	170000	5400	C	N/A	N/A	X	ASC
98-82-8	Isopropylbenzene (Cumene)	75	J	8200	J	µg/kg	TT-21; 7 ft bgs (10/08/08)	6/54	4 - 1800	8200	210000	N	N/A	N/A		BSC
79-20-9	Methyl acetate	78	J	290	J	µg/kg	TP-5; 12 ft bgs (10/06/08)	5/54	7.9 - 23000	290	7800000	N	N/A	N/A		BSC
108-87-2	Methyl cyclohexane	0.61	J	64000		µg/kg	TT-21; 7 ft bgs (10/08/08)	14/55	8.5 - 3600	64000	--	--	N/A	N/A		NTX
1634-04-4	Methyl Tert Butyl Ether	0.62	J	0.62	J	µg/kg	TT-8; 4 ft bgs (10/06/08)	1/54	16 - 46000	0.62	43000	C	N/A	N/A		BSC
75-09-2	Methylene chloride	0.84	J	500	J	µg/kg	TT-18; 5 ft bgs (10/01/08)	11/66	4 - 11000	500	11000	C	N/A	N/A		BSC
127-18-4	Tetrachloroethene	1.6	J	2500	J	µg/kg	TT-20; 7 ft bgs (10/07/08)	10/76	4 - 11000	2500	550	C	N/A	N/A	X	ASC
108-88-3	Toluene	0.23	J	50000		µg/kg	TT-21; 7 ft bgs (10/08/08)	27/76	4.2 - 1800	50000	500000	N	N/A	N/A		BSC
156-60-5	trans-1,2-Dichloroethene	0.95	J	56	J	µg/kg	TT-21; 8 ft bgs (10/08/08)	2/54	4 - 11000	56	15000	N	N/A	N/A		BSC
79-01-6	Trichloroethene	1	J	400		µg/kg	TT-21; 8 ft bgs (10/08/08)	11/76	4 - 11000	400	2800	C	N/A	N/A		BSC
76-13-1	Trifluorotrichloroethane (Freon 113)	21	J	21	J	µg/kg	TP-2; 5 ft bgs (09/24/08)	1/54	4 - 11000	21	4300000	N	N/A	N/A		BSC
75-01-4	Vinyl chloride	5.5	J	220	J	µg/kg	TT-9; 7 ft bgs (10/03/08)	4/65	4 - 11000	220	60	C	N/A	N/A	X	ASC
1330-20-7	Xylenes (total)	0.98	J	480000		µg/kg	TT-21; 7 ft bgs (10/08/08)	21/76	5 - 580	480000	63000	N	N/A	N/A	X	ASC

TABLE B.2.3

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE AND SUBSURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface and Subsurface Soil (0-15 ft bgs)
Exposure Medium: Soil

CAS Number	Chemical	Minimum Concentration (1,2)	Minimum Qualifier	Maximum Concentration (1,2)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	SVOCs															
91-57-6	2-Methylnaphthalene	10		11000		µg/kg	TT-21; 7 ft bgs (10/08/08)	38/77	6.9 - 530	11000	31000	N	N/A	N/A		BSC
83-32-9	Acenaphthene	7.1		2600		µg/kg	TT-7; 6 ft bgs (10/07/08)	25/77	6.9 - 530	2600	340000	N	N/A	N/A		BSC
208-96-8	Acenaphthylene	8		180		µg/kg	TT-5; 3 ft bgs (09/30/08)	12/66	6.9 - 530	180	170000 (7)	N	N/A	N/A		BSC
120-12-7	Anthracene	8.6		3300		µg/kg	TT-5; 14 ft bgs (09/30/08)	33/77	6.9 - 530	3300	1700000	N	N/A	N/A		BSC
56-55-3	Benzo(a)anthracene	8		8500		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	51/77	6.9 - 530	8500	150	C	N/A	N/A	X	ASC
50-32-8	Benzo(a)pyrene	7.4		6000		µg/kg	TT-5; 3 ft bgs (09/30/08)	50/77	6.9 - 530	6000	15	C	N/A	N/A	X	ASC
205-99-2	Benzo(b)fluoranthene	7.1		9500		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	55/77	6.9 - 530	9500	150	C	N/A	N/A	X	ASC
191-24-2	Benzo(g,h,i)perylene	11		4700		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	46/77	6.9 - 530	4700	170000 (7)	N	N/A	N/A		BSC
207-08-9	Benzo(k)fluoranthene	7.6		6400		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	40/77	6.9 - 530	6400	1500	C	N/A	N/A	X	ASC
92-52-4	Biphenyl	64		1600	J	µg/kg	TT-21; 7 ft bgs (10/08/08)	2/55	52 - 1500	1600	390000	N	N/A	N/A		BSC
117-81-7	bis(2-Ethylhexyl)phthalate	24	J	6200		µg/kg	TP-3; 10.4 ft bgs (09/24/08)	20/77	52 - 4100	6200	35000	C	N/A	N/A		BSC
85-68-7	Butyl benzylphthalate	25	J	18000	E	µg/kg	S09 (OEPA); 0.3-0.5 ft bgs (07/09/96)	12/77	52 - 3400	18000	260000	C	N/A	N/A		BSC
86-74-8	Carbazole	22	J	1700		µg/kg	TT-5; 14 ft bgs (09/30/08)	13/66	52 - 3400	1700	--	--	N/A	N/A		NTX
218-01-9	Chrysene	8.1		6400	J	µg/kg	S6 (EPA); 0.1- ft bgs (10/23/90)	59/77	6.9 - 530	6400	15000	C	N/A	N/A		BSC
53-70-3	Dibenz(a,h)anthracene	11		1600		µg/kg	S6 (EPA); 0.1- ft bgs (10/23/90)	21/77	6.9 - 530	1600	15	C	N/A	N/A	X	ASC
132-64-9	Dibenzofuran	28	J	890		µg/kg	TT-5; 14 ft bgs (09/30/08)	15/77	52 - 3400	890	7800	N	N/A	N/A		BSC
131-11-3	Dimethyl phthalate	2000		2000		µg/kg	TP-3; 8.7 ft bgs (09/24/08)	1/66	52 - 3400	2000	--	--	N/A	N/A		NTX
84-74-2	Di-n-butylphthalate	18	J	5100		µg/kg	TT-21; 7 ft bgs (10/08/08)	14/77	52 - 1500	5100	610000	N	N/A	N/A		BSC
117-84-0	Di-n-octylphthalate	19	J	23	J	µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	2/66	52 - 3400	23	--	--	N/A	N/A		NTX
206-44-0	Fluoranthene	8.9		21000	D	µg/kg	S6 (EPA); 0.1- ft bgs (10/23/90) TT-7; 6 ft bgs (10/07/08)	65/77	6.9 - 530	21000	230000	N	N/A	N/A		BSC
86-73-7	Fluorene	7.3		3900		µg/kg	TP-3; 10.4 ft bgs (09/24/08)	27/77	6.9 - 530	3900	230000	N	N/A	N/A		BSC
193-39-5	Indeno(1,2,3-cd) pyrene	8.1		5000		µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	44/77	6.9 - 530	5000	150	C	N/A	N/A	X	ASC
91-20-3	Naphthalene	8.7		19000		µg/kg	TT-21; 7 ft bgs (10/08/08)	33/77	6.9 - 530	19000	3600	C	N/A	N/A	X	ASC
86-30-6	N-Nitrosodiphenylamine	27	J	450	J	µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	2/77	52 - 3400	450	99000	C	N/A	N/A		BSC
87-86-5	Pentachlorophenol	110	J	110	J	µg/kg	TT-3; 10 ft bgs (09/29/08)	1/66	160 - 10000	110	3000	C	N/A	N/A		BSC
85-01-8	Phenanthrene	7.9		16000	D	µg/kg	S3 (EPA); 0-1 ft bgs (10/23/90)	62/77	6.9 - 530	16000	170000 (7)	N	N/A	N/A		BSC
108-95-2	Phenol	64	J	970	J	µg/kg	TT-7; 6 ft bgs (10/07/08)	2/66	52 - 3400	970	1800000	N	N/A	N/A		BSC
129-00-0	Pyrene	7.9		13000		µg/kg	TT-5; 14 ft bgs (09/30/08) TT-7; 6 ft bgs (10/07/08)	65/77	6.9 - 1300	13000	170000	N	N/A	N/A		BSC

TABLE B.2.3

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE AND SUBSURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Sceriario Timeframe: Current/Future
Medium: Surface and Subsurface Soil (0-15 ft bgs)
Exposure Medium: Soil

CAS Number	Chemical	Minimum Concentration (1,2)	Minimum Qualifier	Maximum Concentration (1,2)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	Metals															
7429-90-5	Aluminum	1050000		21700000		µg/kg	TT-23; 7 ft bgs (10/06/08)	77/77	–	21700000	7700000	N	N/A	N/A	X	ASC
7440-36-0	Antimony	440	B	669000	B	µg/kg	TT-5; 7 ft bgs (09/30/08)	49/77	680 - 34500	669000	3100	N	N/A	N/A	X	ASC
7440-38-2	Arsenic	1600	J	141000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	77/77	1200	141000	390	C	N/A	N/A	X	ASC
7440-39-3	Barium	7200	J	13000000		µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	77/77	–	13000000	1500000	N	N/A	N/A	X	ASC
7440-41-7	Beryllium	58	B	5800		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	71/77	250 - 1000	5800	16000	N	N/A	N/A		BSC
7440-43-9	Cadmium	69	B	46100	B	µg/kg	TT-19; 7 ft bgs (10/07/08)	65/77	230 - 1000	46100	7000	N	N/A	N/A	X	ASC
7440-70-2	Calcium	979000	J	217000000	B	µg/kg	TT-4; 5 ft bgs (09/29/08)	77/77	–	217000000	–	–	N/A	N/A		NUT
7440-47-3	Chromium	2500		1080000	B	µg/kg	TT-23; 7 ft bgs (10/06/08)	77/77	–	1080000	12000000	C	N/A	N/A		BSC
7440-48-4	Cobalt	1400	J	317000		µg/kg	TT-23; 7 ft bgs (10/06/08)	76/77	10000	317000	2300	N	N/A	N/A	X	ASC
7440-50-8	Copper	7900		191000000		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	77/77	–	191000000	310000	N	N/A	N/A	X	ASC
57-12-5	Cyanide	130	B	70700		µg/kg	TT-21; 7 ft bgs (10/08/08)	31/69	170 - 790	70700	160000	N	N/A	N/A		BSC
7439-89-6	Iron	1860000		135000000		µg/kg	TT-20; 7 ft bgs (10/07/08)	77/77	–	135000000	5500000	N	N/A	N/A	X	ASC
7439-92-1	Lead	3700	B	17700000		µg/kg	TT-23; 7 ft bgs (10/06/08)	77/77	–	17700000	400000	N	N/A	N/A	X	ASC
7439-95-4	Magnesium	294000	J	58700000		µg/kg	TT-5; 3 ft bgs (09/30/08)	77/77	–	58700000	–	–	N/A	N/A		NUT
7439-96-5	Manganese	6900		2200000		µg/kg	TT-15; 8.6 ft bgs (09/25/08)	77/77	–	2200000	180000	N	N/A	N/A	X	ASC
7439-97-6	Mercury	16	B	2600		µg/kg	TT-7; 6 ft bgs (10/07/08)	53/77	8 - 170	2600	560	N	N/A	N/A	X	ASC
7440-02-0	Nickel	4500		475000		µg/kg	TT-5; 7 ft bgs (09/30/08)	77/77	–	475000	150000	N	N/A	N/A	X	ASC
7440-09-7	Potassium	86000	J	2150000		µg/kg	TT-20; 7 ft bgs (10/07/08)	77/77	–	2150000	–	–	N/A	N/A		NUT
7782-49-2	Selenium	610	B	20100	B	µg/kg	TT-4; 3 ft bgs (09/29/08)	41/77	900 - 331000	20100	39000	N	N/A	N/A		BSC
7440-22-4	Silver	110	B	7600		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	26/77	210 - 2000	7600	39000	N	N/A	N/A		BSC
7740-23-5	Sodium	43700	J	3110000		µg/kg	TT-5; 7 ft bgs (09/30/08)	53/77	520000 - 791000	3110000	–	–	N/A	N/A		NUT
18496-25-8	Sulfide	18600	J	489000		µg/kg	TT-21; 7 ft bgs (10/08/08)	6/6	–	489000	–	–	N/A	N/A		NTX
7440-28-0	Thallium	120		4500		µg/kg	S10 (OEPA); 0-0.3 ft bgs (07/09/96)	35/77	100 - 26400	4500	–	N	N/A	N/A		NTX
7440-62-2	Vanadium	620	J	92600		µg/kg	S02 (OEPA); 0-0.1 ft bgs (07/09/96)	77/77	–	92600	39000	N	N/A	N/A	X	ASC
7440-66-6	Zinc	7700	B	21900000	B	µg/kg	TT-5; 7 ft bgs (09/30/08)	77/77	–	21900000	2300000	N	N/A	N/A	X	ASC
	PCBs															
53469-21-9	Aroclor-1242 (PCB-1242)	490		10000		µg/kg	TP-5; 12 ft bgs (10/06/08)	3/71	34 - 4500	10000	220	C	N/A	N/A		LDF
12672-29-6	Aroclor-1248 (PCB-1248)	59		8100		µg/kg	TT-19; 7 ft bgs (10/07/08)	11/82	34 - 4500	8100	220	C	N/A	N/A	X	ASC
11097-69-1	Aroclor-1254 (PCB-1254)	20	J	21000		µg/kg	TT-21; 7 ft bgs (10/08/08)	18/71	34 - 1800	21000	220	C	N/A	N/A	X	ASC
11096-82-5	Aroclor-1260 (PCB-1260)	23	J	2800		µg/kg	S2 (EPA); 0-1 ft bgs (10/23/90)	22/82	34 - 4500	2800	220	C	N/A	N/A	X	ASC

TABLE B.2.3

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE AND SUBSURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface and Subsurface Soil (0-15 ft bgs)
Exposure Medium: Soil

CAS Number	Chemical	Minimum Concentration (1,2)	Minimum Qualifier	Maximum Concentration (1,2)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	Pesticides															
72-54-8	4,4'-DDD	0.65	J	4.4		µg/kg	S11 (OEPA); 0.2-0.3 ft bgs (07/09/96)	2/64	1.8 - 260	4.4	2000	C	N/A	N/A		BSC
72-55-9	4,4'-DDE	0.44	PJ	400		µg/kg	TT-21; 7 ft bgs (10/08/08)	27/64	1.8 - 260	400	1400	C	N/A	N/A		BSC
50-29-3	4,4'-DDT	0.6	PJ	820		µg/kg	TT-4; 3 ft bgs (09/29/08)	11/64	1.8 - 260	820	1700	C	N/A	N/A		BSC
319-84-6	alpha-BHC	0.71	PJ	0.71	PJ	µg/kg	S08 (OEPA); 0.2-0.3 ft bgs (07/09/96)	1/64	1.8 - 260	0.71	77	C	N/A	N/A		BSC
5103-71-9	alpha-Chlordane	5.4	P	5.4	P	µg/kg	S04 (OEPA); 1.5-2 ft bgs (07/09/96)	1/64	1.8 - 260	5.4	1600	C	N/A	N/A		BSC
60-57-1	Dieldrin	12	J	270	J	µg/kg	TT-9; 7 ft bgs (10/03/08)	8/64	1.8 - 260	270	30	C	N/A	N/A	X	ASC
959-98-8	Endosulfan I	0.42	PJ	0.42	PJ	µg/kg	S07 (OEPA); 0-0.2 ft bgs (07/09/96)	1/64	1.8 - 260	0.42	37000	N	N/A	N/A		BSC
33213-65-9	Endosulfan II	1.4	J	22	J	µg/kg	TP-4; 10 ft bgs (09/24/08)	3/64	1.8 - 260	22	37000	N	N/A	N/A		BSC
72-20-8	Endrin	1.4	PJ	210	J	µg/kg	TT-21; 7 ft bgs (10/08/08)	3/64	1.8 - 260	210	1800	N	N/A	N/A		BSC
7421-93-4	Endrin aldehyde	2.2	PJ	28	J	µg/kg	TT-9; 7 ft bgs (10/03/08)	5/64	1.8 - 260	28	1800	N	N/A	N/A		BSC
53494-70-5	Endrin ketone	1.1	J	89	J	µg/kg	TT-4; 3 ft bgs (09/29/08)	5/64	1.8 - 260	89	1800	N	N/A	N/A		BSC
58-89-9	gamma-BHC (Lindane)	0.42	J	18	J	µg/kg	TT-19; 7 ft bgs (10/07/08)	4/64	1.8 - 260	18	520	C	N/A	N/A		BSC
5103-74-2	gamma-Chlordane	0.35	PJ	540	J	µg/kg	TT-21; 7 ft bgs (10/08/08)	11/64	1.8 - 260	540	1600	C	N/A	N/A		BSC
1024-57-3	Heptachlor epoxide	0.49	PJ	27	J	µg/kg	TT-9; 7 ft bgs (10/03/08)	3/64	1.8 - 260	27	53	C	N/A	N/A		BSC
72-43-5	Methoxychlor	0.94	PJ	400	J	µg/kg	TT-21; 7 ft bgs (10/08/08)	3/64	3.5 - 500	400	31000	N	N/A	N/A		BSC
	Herbicides															
93-76-5	2,4,5-TP (Silvex)	4.6	J	4.6	J	µg/kg	TT-3; 5 ft bgs (09/29/08)	1/53	21 - 2700	4.6	61000	N	N/A	N/A		BSC

TABLE B.2.3

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SURFACE AND SUBSURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface and Subsurface Soil (0-15 ft bgs)
Exposure Medium: Soil

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
–	Dioxins/Furans Total TEQ	0.8		12		pg/g	NE Former Air Curtain Destructor from AshPile (07/11/08)	2/2	–	12	4.5 C	N/A	N/A	X	ASC

Notes:

(1) Minimum/maximum detected concentration.

(2) Based on data collected from sampling locations: Black Sand Fill (TP3,TP4), Black Sand Fill (TT-7,TT-20), Centre Room of Trailer, Construction Debris Area, Desk Surface in Trailer, Exterior West Side of Trailer, Frame of Office Trailer, Gray/Black Sand/Gravel Fill (TT-21/TT-22), NE Former Air Curtain Destructor from AshPile, NW of MW101A (from AshPile), Roll-off Box (Boart Longyear VAS Soil), Right Side Tire of Mobile Office Trailer, Trailer Desk Surface, BH8-09, S1 (EPA), S2 (EPA), S3 (EPA), S4 (EPA), S5 (EPA), S6 (EPA), S7 (EPA), S8 (EPA), S9 (EPA), S10 (EPA), S11 (EPA), S01 (OEPA), S02 (OEPA), S03 (OEPA), S04 (OEPA), S05 (OEPA), S06 (OEPA), S07 (OEPA), S08 (OEPA), S09 (OEPA), S10 (OEPA), S11 (OEPA), TP-1, TP-2, TP-3, TP-4, TP-5, TP-6, TT-1, TT-2, TT-3, TT-4, TT-5, TT-7, TT-8, TT-9, TT-10, TT-11, TT-12, TT-13, TT-14, TT-15, TT-16, TT-17, TT-18, TT-19, TT-20, TT-21, TT-22, TT-23, VAS-5, VAS-21B.

(3) Maximum concentration is used for screening.

(4) Regional Screening Level Table (RSL) Master, December 2009, Residential Soil Screening Levels.
Note: to account for multiple end points, non-carcinogens were adjusted by a factor of 10 (HI=0.1).

(5) Rationale Codes

Selection Reason: Maximum detected greater than Screening Criterion (ASC)
Analyte Detected (AD)

Deletion Reason: Maximum detected less than Screening Criterion (BSC)
Low Detection Frequency; less than or equal to 5% (LDF)
Essential Nutrient (NUT)
No Toxicity Data (NTX)

(6) No criterion available for this analyte therefore, substituted 1,2-dichlorobenzene screening level.

(7) No criterion available for this analyte therefore, substituted most conservative non-carcinogenic PAH (pyrene) screening level.

Definitions:

C = Carcinogenic
N = Non-Carcinogenic
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
– = Not Available
N/A = Not Applicable
J = Estimated.
D = Compounds at secondary dilution factor.
E = Exceed calibration range of GC/MS instrument
B = Method blank contamination.
P = Difference for detected Aroclor > 25% between 2 GC column.
SVOCs - Semi Volatile Organic Compounds
VOCs - Volatile Organic Compounds
µg/kg - microgram per kilogram
PCBs - Polychlorinated biphenyls
pg/g - picogram per gram
ft bgs - feet below ground surface
TEQ - Toxicity Equivalent

TABLE B.2.4

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum Concentration (1,2)	Minimum Qualifier	Maximum Concentration (1,2)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	VOCs															
71-55-6	1,1,1-Trichloroethane	0.22	J	8.9		µg/L	MW-201 (05/10/00)	38/368	1 - 120	8.9	910	N	N/A	N/A		BSC
79-34-5	1,1,2,2-Tetrachloroethane	1	J	1	J	µg/L	MW-103 (05/28/98)	1/368	1 - 120	1	0.067	C	N/A	N/A		LDF
75-34-3	1,1-Dichloroethane	0.22	J	20000		µg/L	MW-101A (05/28/98)	109/376	0.5 - 120	20000	2.4	C	N/A	N/A	X	ASC
75-35-4	1,1-Dichloroethene	0.24	J	2.5		µg/L	VAS-14 (11/18/08)	14/254	1 - 120	2.5	34	N	N/A	N/A		BSC
95-63-6	1,2,4-Trimethylbenzene	0.5		0.6		µg/L	SD004A (02/23/96)	2/8	0.5	0.6	1.5	N	N/A	N/A		BSC
95-50-1	1,2-Dichlorobenzene	0.21	J	0.5	J	µg/L	VAS-4 (11/06/08)	2/254	1 - 120	0.5	37	N	N/A	N/A		BSC
107-06-2	1,2-Dichloroethane	0.25	J	34		µg/L	MW-101A (11/11/99)	9/376	0.5 - 120	34	0.15	C	N/A	N/A	X	ASC
540-59-0	1,2-Dichloroethene (total)	2	J	480		µg/L	MW-101A (06/14/02)	24/116	1 - 10	480	33	N	N/A	N/A	X	ASC
106-46-7	1,4-Dichlorobenzene	0.3	J	0.3	J	µg/L	VAS-4 (11/06/08)	1/254	1 - 120	0.3	0.43	C	N/A	N/A		BSC
78-93-3	2-Butanone (MEK)	0.57	J	19		µg/L	VAS-12 (11/10/08)	18/254	10 - 1200	19	710	N	N/A	N/A		BSC
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.57	J	2	J	µg/L	VAS-21B (06/05/09)	4/254	10 - 1200	2	200	N	N/A	N/A		BSC
67-64-1	Acetone	1.1	J	30		µg/L	MW-101A (07/09/96)	10/368	1 - 1200	30	2200	N	N/A	N/A		BSC
71-43-2	Benzene	0.22	J	580		µg/L	VAS-21B (06/03/09)	61/376	1 - 120	580	0.41	C	N/A	N/A	X	ASC
75-27-4	Bromodichloromethane	0.5	J	1.3		µg/L	MW-202 (09/05/08)	2/254	1 - 120	1.3	0.12	C	N/A	N/A		LDF
75-25-2	Bromoform	0.6	J	0.6	J	µg/L	MW-101A (05/28/98)	1/368	1 - 120	0.6	8.5	C	N/A	N/A		BSC
75-15-0	Carbon disulfide	0.29	J	0.68	J	µg/L	VAS-5 (12/16/08)	6/254	1 - 120	0.68	100	N	N/A	N/A		BSC
108-91-7	Chlorobenzene	0.2	J	130		µg/L	VAS-11 (12/08/08)	26/368	1 - 120	130	9.1	N	N/A	N/A	X	ASC
75-00-3	Chloroethane	0.36	J	22		µg/L	MW-102 (07/09/96)	12/368	1 - 120	22	2100	N	N/A	N/A		BSC
67-66-3	Chloroform (Trichloromethane)	0.18	J	3.1		µg/L	MW-202 (09/05/08)	13/254	1 - 120	3.1	0.19	C	N/A	N/A	X	ASC
74-87-3	Chloromethane	0.34	J	0.44	J	µg/L	MW-103 (09/11/08)	2/254	1 - 120	0.44	19	N	N/A	N/A		BSC
156-59-2	cis-1,2-Dichloroethene	0.21	J	3900	J	µg/L	VAS-9 (11/18/08)	139/259	0.5 - 20	3900	37	N	N/A	N/A	X	ASC
110-82-7	Cyclohexane	0.12	J	2.5	J	µg/L	MW-215A (07/24/09)	125/251	1 - 120	2.5	1300	N	N/A	N/A		BSC
124-48-1	Dibromochloromethane	0.48	J	0.76	J	µg/L	MW-202 (09/05/08)	2/254	1 - 120	0.76	0.15	C	N/A	N/A		LDF
100-41-4	Ethylbenzene	0.2	J	89		µg/L	VAS-5 (12/15/08)	35/362	0.5 - 120	89	1.5	C	N/A	N/A	X	ASC
98-82-8	Isopropylbenzene (Cumene)	0.18	J	36		µg/L	VAS-5 (12/15/08)	7/251	1 - 120	36	68	N	N/A	N/A		BSC
108-87-2	Methyl cyclohexane	0.52	J	14	J	µg/L	MW-215A (07/24/09)	17/251	1 - 120	14	--	--	N/A	N/A		NTX
1634-04-4	Methyl Tert Butyl Ether	0.19	J	0.86	J	µg/L	VAS-9 (11/18/08)	9/251	5 - 620	0.86	12	C	N/A	N/A		BSC
75-09-2	Methylene chloride	0.5	J	51	B	µg/L	MW-209 (11/11/99)	20/368	1 - 120	51	4.8	C	N/A	N/A	X	ASC
100-42-5	Styrene	0.57	J	0.9	J	µg/L	VAS-9 (11/19/08)	3/368	1 - 120	0.9	160	N	N/A	N/A		BSC
127-18-4	Tetrachloroethene	0.29	J	4.6		µg/L	VAS-11 (12/08/08)	24/368	1 - 120	4.6	0.11	C	N/A	N/A	X	ASC
108-88-3	Toluene	0.17	J	180		µg/L	VAS-13 (12/01/08)	214/376	1 - 20	180	230	N	N/A	N/A		BSC
156-60-5	trans-1,2-Dichloroethene	0.19	J	3.2	J	µg/L	VAS-14 (11/17/08)	56/251	1 - 120	3.2	11	N	N/A	N/A		BSC
79-01-6	Trichloroethene	0.3	J	5100		µg/L	VAS-9 (11/18/08)	144/376	0.5 - 20	5100	2	C	N/A	N/A	X	ASC
75-01-4	Vinyl chloride	0.22	J	760		µg/L	VAS-9 (11/18/08)	147/376	0.5 - 20	760	0.016	C	N/A	N/A	X	ASC
1330-20-7	Xylenes (total)	0.47	J	75		µg/L	MW-215A (07/24/09)	27/368	2 - 250	75	20	N	N/A	N/A	X	ASC

TABLE B.2.4

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	SVOCs															
91-57-6	2-Methylnaphthalene	0.26		56		µg/L	MW-215A (07/24/09)	6/101	0.2 - 10	56	15	N	N/A	N/A	X	ASC
106-44-5	4-Methylphenol	1.5	J	1.7		µg/L	MW-215A (07/24/09)	2/101	1 - 20	1.7	18	N	N/A	N/A		BSC
83-32-9	Acenaphthene	0.21		10		µg/L	MW-215A (07/24/09)	5/101	0.2 - 10	10	220	N	N/A	N/A		BSC
120-12-7	Anthracene	0.21		1.3		µg/L	MW-218B (07/21/09)	5/101	0.2 - 10	1.3	1100	N	N/A	N/A		BSC
56-55-3	Benzo(a)anthracene	0.21		1.3		µg/L	MW-218B (07/21/09)	4/101	0.2 - 10	1.3	0.029	C	N/A	N/A		LDF
50-32-8	Benzo(a)pyrene	0.56		1.1		µg/L	VAS-19 (12/15/08)	5/101	0.2 - 10	1.1	0.0029	C	N/A	N/A		LDF
205-99-2	Benzo(b)fluoranthene	0.81		1.2		µg/L	VAS-2 (01/08/09)	4/101	0.2 - 10	1.2	0.029	C	N/A	N/A		LDF
191-24-2	Benzo(g,h,i)perylene	0.29		0.9		µg/L	VAS-2 (01/08/09)	3/101	0.2 - 10	0.9	110 (6)	N	N/A	N/A		BSC
207-08-9	Benzo(k)fluoranthene	0.29		0.45		µg/L	P-211 (10/03/08)	3/101	0.2 - 10	0.45	0.29	C	N/A	N/A		LDF
92-52-4	Biphenyl	1.2		1.2		µg/L	MW-215A (07/24/09)	1/98	1 - 20	1.2	180	N	N/A	N/A		BSC
117-81-7	bis(2-Ethylhexyl)phthalate	0.85	J	7.9		µg/L	VAS-20 (01/11/09)	16/102	2 - 40	7.9	4.8	C	N/A	N/A	X	ASC
85-68-7	Butyl benzylphthalate	0.95	J	1.1		µg/L	VAS-6 (01/07/09)	3/101	1 - 20	1.1	35	C	N/A	N/A		BSC
105-60-2	Caprolactam	2.4	J	20		µg/L	MW-202 (09/05/08)	8/97	5 - 100	20	1800	N	N/A	N/A		BSC
86-74-8	Carbazole	0.92	J	3.3		µg/L	P-211 (10/03/08)	3/98	1 - 20	3.3	–	–	N/A	N/A		NTX
218-01-9	Chrysene	0.2		1.7		µg/L	P-211 (10/03/08)	4/101	0.2 - 10	1.7	2.9	C	N/A	N/A		BSC
132-64-9	Dibenzofuran	0.19	J	3.2		µg/L	MW-215A (07/24/09)	4/101	1 - 20	3.2	3.7	N	N/A	N/A		BSC
84-66-2	Diethylphthalate	1.2		1.3		µg/L	VAS-6 (01/07/09)	2/101	1 - 20	1.3	2900	N	N/A	N/A		BSC
84-74-2	Di-n-butylphthalate	0.76	J	3.5		µg/L	VAS-21 (10/28/08)	4/101	1 - 20	3.5	370	N	N/A	N/A		BSC
117-84-0	Di-n-octylphthalate	1	J	1	J	µg/L	MW-101A (07/09/96)	1/101	1 - 20	1	–	–	N/A	N/A		NTX
206-44-0	Fluoranthene	0.19	J	5.2		µg/L	P-211 (10/03/08)	9/101	0.2 - 10	5.2	150	N	N/A	N/A		BSC
86-73-7	Fluorene	0.29		2.2		µg/L	MW-215A (07/24/09)	5/101	0.2 - 10	2.2	150	N	N/A	N/A		BSC
193-39-5	Indeno(1,2,3-cd) pyrene	0.24		0.88		µg/L	VAS-2 (01/08/09)	3/101	0.2 - 10	0.88	0.029	C	N/A	N/A		LDF
91-20-3	Naphthalene	0.19	J	17		µg/L	MW-215A (07/24/09)	7/101	0.2 - 10	17	0.14	C	N/A	N/A	X	ASC
85-01-8	Phenanthrene	0.36		5.9		µg/L	P-211 (10/03/08)	8/101	0.2 - 10	5.9	110 (6)	N	N/A	N/A		BSC
108-95-2	Phenol	130	EB	130	EB	µg/L	MW-101A (07/09/96)	1/101	1 - 20	130	1100	N	N/A	N/A		BSC
129-00-0	Pyrene	0.27		3.9		µg/L	P-211 (10/03/08)	7/101	0.2 - 10	3.9	110	N	N/A	N/A		BSC
	Metals															
7429-90-5	Aluminum	98.4	B	10000		µg/L	MW-101A (07/09/96)	18/34	200	10000	3700	N	N/A	N/A	X	ASC
7440-36-0	Antimony	0.23	J	6.7		µg/L	P-211 (10/03/08)	6/34	2 - 3	6.7	1.5	N	N/A	N/A	X	ASC
7440-38-2	Arsenic	0.51	J	47.6		µg/L	P-211 (10/03/08)	38/57	4	47.6	0.045	C	N/A	N/A	X	ASC
7440-39-3	Barium	84.4	B	2220		µg/L	MW-215A (07/24/09)	40/40	–	2220	730	N	N/A	N/A	X	ASC
7440-43-9	Cadmium	0.28	J	0.28	J	µg/L	P-211 (10/03/08)	1/55	1	0.28	1.8	N	N/A	N/A		BSC
7440-70-2	Calcium	20500		224000		µg/L	MW-101A (07/09/96)	34/34	–	224000	–	–	N/A	N/A		NUT
7440-47-3	Chromium	1.2	B	69		µg/L	MW-102 (01/06/98)	15/57	1 - 10	69	5500	C	N/A	N/A		BSC
7440-48-4	Cobalt	2	J	12.3	B	µg/L	MW-101A (07/09/96)	5/34	1 - 50	12.3	1.1	N	N/A	N/A	X	ASC
7440-50-8	Copper	3.1	B	39.5		µg/L	MW-215A (07/24/09)	6/34	25	39.5	150	N	N/A	N/A		BSC
57-12-5	Cyanide	11		21		µg/L	MW-217 (07/28/09)	3/18	3 - 10	21	73	N	N/A	N/A		BSC
7439-89-6	Iron	106		20600		µg/L	MW-101A (07/09/96)	31/34	100	20600	2600	N	N/A	N/A	X	ASC

TABLE B.2.4

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN GROUNDWATER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	Metals (cont'd)															
7439-92-1	Lead	0.28	J	100		µg/L	MW-209 (02/22/99)	16/57	1	100	--	N	N/A	N/A	X	AD
7439-95-4	Magnesium	4330	J	93200		µg/L	MW-217 (07/28/09)	34/34	--	93200	--	--	N/A	N/A		NUT
7439-96-5	Manganese	8.5	J	1080		µg/L	MW-207 (07/27/09)	34/34	--	1080	88	N	N/A	N/A	X	ASC
7440-02-0	Nickel	1.1	B	29.7	B	µg/L	MW-101A (07/09/96)	7/34	40	29.7	73	N	N/A	N/A		BSC
7440-09-7	Potassium	2020	J	114000		µg/L	MW-101A (07/09/96)	34/34	--	114000	--	--	N/A	N/A		NUT
7782-49-2	Selenium	1.3	J	25.3		µg/L	MW-202 (07/28/09)	7/44	4 - 5	25.3	18	N	N/A	N/A	X	ASC
7740-23-5	Sodium	11800		126000		µg/L	MW-208 (09/05/08)	34/34	--	126000	--	--	N/A	N/A		NUT
7440-28-0	Thallium	0.41	J	4.4	B	µg/L	MW-101A (07/09/96)	2/34	1 - 4	4.4	--	N	N/A	N/A		NTX
7440-62-2	Vanadium	0.92	J	24.2	J	µg/L	P-211 (10/03/08)	3/34	1 - 50	24.2	18	N	N/A	N/A	X	ASC
7440-66-6	Zinc	5.4	J	445		µg/L	Valley Asphalt Well 1 (10/12/08)	8/34	20 - 26	445	1100	N	N/A	N/A		BSC
	PCBs															
53469-21-9	Aroclor-1242 (PCB-1242)	0.19	J	0.19	J	µg/L	MW-202 (07/28/09)	1/33	0.2 - 1	0.19	0.034	C	N/A	N/A		LDF
11097-69-1	Aroclor-1254 (PCB-1254)	0.19	J	0.19	J	µg/L	MW-215A (07/24/09)	1/33	0.2 - 1	0.19	0.034	C	N/A	N/A		LDF
11096-82-5	Aroclor-1260 (PCB-1260)	0.16	J	0.19	J	µg/L	MW-204 (07/28/09)	2/33	0.2 - 1	0.19	0.034	C	N/A	N/A	X	ASC
	Pesticides															
72-55-9	4,4'-DDE	0.017	J	0.017	J	µg/L	MW-215A (07/24/09)	1/33	0.05 - 0.1	0.017	0.2	C	N/A	N/A		BSC
319-84-6	alpha-BHC	0.034	J	0.034	J	µg/L	MW-215A (07/24/09)	1/33	0.05	0.034	0.011	C	N/A	N/A		LDF
319-85-7	beta-BHC	0.011	J	0.011	J	µg/L	MW-204 (09/10/08)	1/33	0.05	0.011	0.037	C	N/A	N/A		BSC
608-73-1	delta-BHC	0.013	J	0.02	J	µg/L	MW-202 (09/05/08)	3/33	0.05	0.02	0.037	C	N/A	N/A		BSC
60-57-1	Dieldrin	0.013	J	0.013	J	µg/L	MW-207 (07/27/09)	1/33	0.05 - 0.1	0.013	0.0042	C	N/A	N/A		LDF
76-44-8	Heptachlor	0.0082	PJ	0.051	PJ	µg/L	MW-101A (07/09/96)	4/33	0.05	0.051	0.015	C	N/A	N/A	X	ASC

Notes:

(1) Minimum/maximum detected concentration.

(2) Based on data collected from sampling locations: MW-101A, MW-102, MW-103, MW-201, MW-202, MW-203, MW-204, MW-206, MW-207, MW-208, MW-209A, MW-210, MW-212, MW-215A, MW-217, MW-218A, MW-218B, P-211, SD001, SD002, SD004A, SD005, Valley Asphalt Well 1, Valley Asphalt Well 2, VAS-1, VAS-2, VAS-3, VAS-4, VAS-5, VAS-6, VAS-7, VAS-8, VAS-9, VAS-11, VAS-12, VAS-13, VAS-14, VAS-15, VAS-17, VAS-29, VAS-20, VAS-21, VAS-21B, VAS-22.

(3) Maximum concentration is used for screening.

(4) Regional Screening Level Table (RSL) Master, December 2009, Tap Water Screening Levels.
Note: to account for multiple end points, non-carcinogens were adjusted by a factor of 10 (HI=0.1).

(5) Rationale Codes
Selection Reason: Maximum detected greater than Screening Criterion (ASC)
Analyte Detected (AD)
Deletion Reason: Maximum detected less than Screening Criterion (BSC)
Low Detection Frequency; less than or equal to 5% (LDF)
Essential Nutrient (NUT)
No Toxicity Data (NTX)

(6) No criterion available for this analyte therefore, substituted most conservative non-carcinogenic PAH (pyrene) screening level.

Definitions:
C = Carcinogenic
N = Non-Carcinogenic
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
-- = Not Available
N/A = Not Applicable
J = Estimated.
E = Exceed calibration range of GC/MS instrument
B = Method blank contamination.
P = Difference for detected Aroclor > 25% between 2 GC column.
SVOCs - Semi Volatile Organic Compounds
VOCs - Volatile Organic Compounds
PCBs - Polychlorinated biphenyls
ft bgs - feet below ground surface
µg/L - microgram per meter liter

TABLE B.2.5

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SEDIMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	VOCs															
78-93-3	2-Butanone (MEK)	10	J	10	J	µg/kg	S16 (OEPA) (07/09/96)	1/8	20 - 26	10	2800000	N	N/A	N/A		BSC
67-64-1	Acetone	37		47		µg/kg	S15 (OEPA) (07/09/96)	3/8	20	47	6100000	N	N/A	N/A		BSC
108-88-3	Toluene	14		14		µg/kg	SED-3 (05/12/00)	1/8	5 - 29	14	500000	N	N/A	N/A		BSC
79-01-6	Trichloroethene	0.8	J	0.8	J	µg/kg	S15 (OEPA) (07/09/96)	1/8	5 - 29	0.8	2800	C	N/A	N/A		BSC
	SVOCs															
91-57-6	2-Methylnaphthalene	75	J	120	J	µg/kg	S15 (OEPA) (07/09/96)	2/2	–	120	31000	N	N/A	N/A		BSC
83-32-9	Acenaphthene	59	J	92	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	–	92	340000	N	N/A	N/A		BSC
208-96-8	Acenaphthylene	61	J	61	J	µg/kg	S16 (OEPA) (07/09/96)	1/2	850	61	170000 (6)	N	N/A	N/A		BSC
120-12-7	Anthracene	110	J	230	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	–	230	1700000	N	N/A	N/A		BSC
56-55-3	Benzo(a)anthracene	490	J	1500		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	1500	150	C	N/A	N/A	X	ASC
50-32-8	Benzo(a)pyrene	460	J	1800		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	1800	15	C	N/A	N/A	X	ASC
205-99-2	Benzo(b)fluoranthene	800	J	2500		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	2500	150	C	N/A	N/A	X	ASC
191-24-2	Benzo(g,h,i)perylene	490	J	2000		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	2000	170000 (6)	N	N/A	N/A		BSC
207-08-9	Benzo(k)fluoranthene	300	J	950		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	950	1500	C	N/A	N/A		BSC
117-81-7	bis(2-Ethylhexyl)phthalate	470	J	470	J	µg/kg	S16 (OEPA) (07/09/96)	1/2	850	470	35000	C	N/A	N/A		BSC
86-74-8	Carbazole	85	J	110	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	–	110	–	–	N/A	N/A		NTX
218-01-9	Chrysene	550	J	1500		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	1500	15000	C	N/A	N/A		BSC
53-70-3	Dibenz(a,h)anthracene	120	J	480	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	–	480	15	C	N/A	N/A	X	ASC
132-64-9	Dibenzofuran	70	J	95	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	–	95	7800	N	N/A	N/A		BSC
84-66-2	Diethylphthalate	39	J	39	J	µg/kg	S16 (OEPA) (07/09/96)	1/2	850	39	4900000	N	N/A	N/A		BSC
206-44-0	Fluoranthene	1100		2600		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	2600	230000	N	N/A	N/A		BSC
86-73-7	Fluorene	76	J	160	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	–	160	230000	N	N/A	N/A		BSC
193-39-5	Indeno(1,2,3-cd) pyrene	460	J	1900		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	1900	150	C	N/A	N/A	X	ASC
91-20-3	Naphthalene	70	J	77	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	–	77	3600	C	N/A	N/A		BSC
85-01-8	Phenanthrene	890		1500		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	1500	170000 (6)	N	N/A	N/A		BSC
129-00-0	Pyrene	1300		3000		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	3000	170000	N	N/A	N/A		BSC
	Metals															
7429-90-5	Aluminum	2750000		6590000		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	6590000	7700000	N	N/A	N/A		BSC
7440-38-2	Arsenic	10300		12600		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	12600	390	C	N/A	N/A	X	ASC
7440-39-3	Barium	73000		137000		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	137000	1500000	N	N/A	N/A		BSC
7440-41-7	Beryllium	280	J	350	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	–	350	16000	N	N/A	N/A		BSC
7440-70-2	Calcium	11800000		53600000		µg/kg	S15 (OEPA) (07/09/96)	2/2	–	53600000	–	–	N/A	N/A		NUT
7440-47-3	Chromium	17200		23100		µg/kg	S15 (OEPA) (07/09/96)	2/2	–	23100	12000000	C	N/A	N/A		BSC
7440-48-4	Cobalt	3700	J	6700	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	–	6700	2300	N	N/A	N/A	X	ASC
7440-50-8	Copper	24700		29300		µg/kg	S15 (OEPA) (07/09/96)	2/2	–	29300	310000	N	N/A	N/A		BSC
57-12-5	Cyanide	270	J	270	J	µg/kg	S15 (OEPA) (07/09/96)	1/2	170	270	160000	N	N/A	N/A		BSC
7439-89-6	Iron	11300000		13500000		µg/kg	S16 (OEPA) (07/09/96)	2/2	–	13500000	5500000	N	N/A	N/A	X	ASC

TABLE B.2.5

OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN (COPC) IN SEDIMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

CAS Number	Chemical	Minimum (1,2) Concentration	Minimum Qualifier	Maximum (1,2) Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency (2)	Range of Detection Limits (2)	Concentration Used for Screening (3)	Toxicity Screening Level (4)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (5)
	Metals (cont.'d)															
7439-92-1	Lead	33700		42000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	42000	400000	N	N/A	N/A		BSC
7439-95-4	Magnesium	13600000		21600000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	21600000	--	--	N/A	N/A		NUT
7439-96-5	Manganese	205000		545000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	545000	180000	N	N/A	N/A	X	ASC
7440-02-0	Nickel	13400		18700	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	18700	1.50E+05	N	N/A	N/A		BSC
7440-09-7	Potassium	297000	J	736000	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	736000	--	--	N/A	N/A		NUT
7782-49-2	Selenium	590	J	1100	J	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	1100	39000	N	N/A	N/A		BSC
7740-23-5	Sodium	165000	J	206000	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	206000	--	--	N/A	N/A		NUT
7440-28-0	Thallium	680	J	680	J	µg/kg	S15 (OEPA) (07/09/96)	1/2	980	680	--	N	N/A	N/A		NTX
7440-62-2	Vanadium	9600	J	16800	J	µg/kg	S16 (OEPA) (07/09/96)	2/2	--	16800	39000	N	N/A	N/A		BSC
7440-66-6	Zinc	80700		143000		µg/kg	S16 (OEPA) (07/09/96)	2/2	--	143000	2300000	N	N/A	N/A		BSC
	PCBs															
11097-69-1	Aroclor-1254 (PCB-1254)	660		660		µg/kg	S15 (OEPA) (07/09/96)	1/2	94	660	220	C	N/A	N/A	X	ASC
	Pesticides															
72-54-8	4,4'-DDD	1.7	JP	1.7	JP	µg/kg	S15 (OEPA) (07/09/96)	1/2	9.4	1.7	2000	C	N/A	N/A		BSC
72-55-9	4,4'-DDE	2.2	JP	2.2	JP	µg/kg	S16 (OEPA) (07/09/96)	1/2	8.7	2.2	1400	C	N/A	N/A		BSC
50-29-3	4,4'-DDT	2.4	JP	4.4	JP	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	4.4	1700	C	N/A	N/A		BSC
5103-71-9	alpha-Chlordane	1.8	JP	12		µg/kg	S15 (OEPA) (07/09/96)	2/2	--	12	1600	C	N/A	N/A		BSC
60-57-1	Dieldrin	2.6	JP	9.6	P	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	9.6	30	C	N/A	N/A		BSC
1031-07-8	Endosulfan sulfate	3.7	JP	3.7	JP	µg/kg	S15 (OEPA) (07/09/96)	1/2	9.4	3.7	37000	N	N/A	N/A		BSC
72-20-8	Endrin	34		34		µg/kg	S15 (OEPA) (07/09/96)	1/2	9.4	34	1800	N	N/A	N/A		BSC
7421-93-4	Endrin aldehyde	7.9	JP	7.9	JP	µg/kg	S15 (OEPA) (07/09/96)	1/2	9.4	7.9	1800	N	N/A	N/A		BSC
53494-70-5	Endrin ketone	4.9	J	4.9	J	µg/kg	S16 (OEPA) (07/09/96)	1/2	8.7	4.9	1800	N	N/A	N/A		BSC
5103-74-2	gamma-Chlordane	3.2	J	4.9	J	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	4.9	1600	C	N/A	N/A		BSC
72-43-5	Methoxychlor	17	JP	18	J	µg/kg	S15 (OEPA) (07/09/96)	2/2	--	18	31000	N	N/A	N/A		BSC

Notes:

(1) Minimum/maximum detected concentration.

(2) Based on data collected from sampling locations: S15, S16, SED-1, SED-2, SED-3, SEDIMENT-1, SEDIMENT-2, SEDIMENT-3.

(3) Maximum concentration is used for screening.

(4) Regional Screening Level Table (RSL) Master, December 2009, Residential Soil Screening Levels.
Note: to account for multiple end points, non-carcinogens were adjusted by a factor of 10 (HI=0.1).

(5) Rationale Codes
Selection Reason: Maximum detected greater than Screening Criterion (ASC)
Analyte Detected (AD)
Deletion Reason: Maximum detected less than Screening Criterion (BSC)
Low Detection Frequency; less than or equal to 5% (LDF)
Essential Nutrient (NUT)
No Toxicity Data (NTX)

(6) No criterion available for this analyte therefore, substituted most conservative non-carcinogenic PAH (pyrene) screening level.

Definitions:
C = Carcinogenic
N = Non-Carcinogenic
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
-- = Not Available
N/A = Not Applicable
J = Estimated.
P = Difference for detected Aroclor > 25% between 2 GC column.
SVOCs - Semi Volatile Organic Compounds
VOCs - Volatile Organic Compounds
µg/kg - microgram per kilogram
PCBs - Polychlorinated biphenyls
PAH - Polycyclic aromatic hydrocarbons

TABLE B.3.1

ESTIMATED AMBIENT AIR CONCENTRATION FROM ON-SITE SOIL GAS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

			Residential	
Chemicals of Potential Concern	*Soil Gas Concentration (µg/m³) (1)*	*Ambient Air Concentration (µg/m³) (2)*	*Ambient Air RSL (µg/m³) (3)*	*Above RSL Y- Yes N- No*
1,1-Dichloroethane	7.20E+03	1.07E+00	1.50E+00	N
1,1-Dichloroethene	4.20E+02	7.58E-02	2.10E+01	N
1,4-Dichlorobenzene	1.90E+00	2.63E-04	2.20E-01	N
Benzene	**1.40E+04**	**2.47E+00**	**3.10E-01**	**Y**
Bromomethane	8.50E+00	1.24E-03	5.20E-01	N
Chlorobenzene	1.20E+04	1.76E+00	5.20E+00	N
Chloroethane	1.40E+03	7.60E-01	1.00E+03	N
Chloroform	1.50E+02	3.13E-02	1.10E-01	N
cis-1,2-Dichloroethene	1.60E+04	2.36E+00	--	N
Cyclohexane	5.00E+04	8.02E+00	6.30E+02	N
Dichlorodifluoromethane	1.40E+03	1.87E-01	2.10E+01	N
Ethylbenzene	**4.80E+04**	**7.22E+00**	**9.70E-01**	**Y**
Isopropylbenzene	4.10E+03	5.34E-01	4.20E+01	N
Methyl Tert Butyl Ether	3.80E+01	7.80E-03	9.40E+00	N
Methylene chloride	5.90E+01	1.19E-02	5.20E+00	N
Naphthalene	**9.80E+02**	**1.16E-01**	**7.20E-02**	**Y**
Tetrachloroethene	6.10E+02	8.81E-02	4.10E-01	N
Toluene	2.80E+03	4.88E-01	5.20E+02	N
trans-1,2-Dichloroethene	3.10E+02	4.39E-02	6.30E+00	N
Trichloroethene	**5.60E+04**	**8.87E+00**	**1.20E+00**	**Y**
Trichlorofluoromethane	7.40E+01	1.29E-02	7.30E+01	N
Vinyl chloride	**1.40E+04**	**2.98E+00**	**1.60E-01**	**Y**
Xylenes (total)	4.70E+04	8.01E+00	1.00E+01	N

Notes:

µg/m³ - microgram per cubic meter

(1) Soil gas concentration is the maximum detected concentration taken from Table B.2.1.

(2) Ambient air concentrations obtained by multiplying the soil concentrations by the chemical-specific Volatilization Factors (VF_{sgamb}) calculated in Table B.3.2.

(3) Regional Screening Level Table (RSL) Master, April 2009, Residential Air Screening Levels.

TABLE B.3.2

CALCULATION OF SOIL GAS TO AMBIENT AIR VOLATILIZATION FACTORS (VF_{sgamb})

SOUTH DAYTON DUMP AND LANDFILL SITE

MORAINE, OHIO

Chemicals of Potential Concern	Chemical Properties (1): Henry's Law Constant, H_L (atm m³/mol) (1)		Water Diffusion Coefficient, D_{H2O} (cm²/s) (1)		Air Diffusion Coefficient, D_{air} (cm²/s) (1)		Henry's Law Constant, H' (unitless) (2)	D_s^{eff} (cm²/sec) (3)	D_{ws}^{eff} (cm²/sec) (4)
1,1-Dichloroethane	3.02E-03	(11° C)	1.05E-05	(25° C)	6.90E-02	(11° C)	1.30E-01	1.12E-02	1.12E-02
1,1-Dichloroethene	1.53E-02	(11° C)	1.04E-05	(25° C)	8.37E-02	(11° C)	6.57E-01	1.35E-02	1.35E-02
1,4-Dichlorobenzene	9.41E-04	(11° C)	7.90E-06	(25° C)	6.42E-02	(11° C)	4.03E-02	1.04E-02	1.04E-02
Benzene	2.82E-03	(11° C)	9.80E-06	(25° C)	8.19E-02	(11° C)	1.21E-01	1.32E-02	1.32E-02
Bromomethane	3.89E-03	(11° C)	1.21E-05	(25° C)	6.77E-02	(11° C)	1.67E-01	1.09E-02	1.09E-02
Chlorobenzene	1.63E-03	(11° C)	8.70E-06	(25° C)	6.79E-02	(11° C)	7.01E-02	1.10E-02	1.10E-02
Chloroethane	5.39E-03	(11° C)	1.15E-05	(25° C)	2.52E-01	(11° C)	2.31E-01	4.08E-02	4.08E-02
Chloroform	1.95E-03	(11° C)	1.00E-05	(25° C)	9.68E-02	(11° C)	8.38E-02	1.56E-02	1.56E-02
cis-1,2-Dichloroethene	2.14E-03	(11° C)	1.13E-05	(25° C)	6.85E-02	(11° C)	9.18E-02	1.11E-02	1.11E-02
Cyclohexane	7.40E-02	(11° C)	9.10E-06	(25° C)	7.44E-02	(11° C)	3.17E+00	1.20E-02	1.20E-02
Dichlorodifluoromethane	1.71E-01	(11° C)	9.92E-06	(25° C)	6.19E-02	(11° C)	7.32E+00	1.00E-02	1.00E-02
Ethylbenzene	3.38E-03	(11° C)	7.80E-06	(25° C)	6.98E-02	(11° C)	1.45E-01	1.13E-02	1.13E-02
Isopropylbenzene	5.11E-03	(11° C)	7.10E-06	(25° C)	6.05E-02	(11° C)	2.19E-01	9.78E-03	9.78E-03
Methyl Tert Butyl Ether	3.40E-04	(11° C)	1.05E-05	(25° C)	9.53E-02	(11° C)	1.46E-02	1.54E-02	1.54E-02
Methylene chloride	1.22E-03	(11° C)	1.17E-05	(25° C)	9.40E-02	(11° C)	5.22E-02	1.52E-02	1.52E-02
Naphthalene	1.65E-04	(11° C)	7.50E-06	(25° C)	5.49E-02	(11° C)	7.07E-03	8.87E-03	8.87E-03
Tetrachloroethene	8.30E-03	(11° C)	8.20E-06	(25° C)	6.70E-02	(11° C)	3.56E-01	1.08E-02	1.08E-02
Toluene	3.10E-03	(11° C)	8.60E-06	(25° C)	8.09E-02	(11° C)	1.33E-01	1.31E-02	1.31E-02
trans-1,2-Dichloroethene	5.17E-03	(11° C)	1.19E-05	(25° C)	6.58E-02	(11° C)	2.22E-01	1.06E-02	1.06E-02
Trichloroethene	5.05E-03	(11° C)	9.10E-06	(25° C)	7.35E-02	(11° C)	2.17E-01	1.19E-02	1.19E-02
Trichlorofluoromethane	5.80E-02	(11° C)	9.70E-06	(25° C)	8.09E-02	(11° C)	2.49E+00	1.31E-02	1.31E-02
Vinyl chloride	1.78E-02	(11° C)	1.23E-05	(25° C)	9.86E-02	(11° C)	7.63E-01	1.59E-02	1.59E-02
Xylenes (total)	2.21E-03	(11° C)	9.90E-06	(25° C)	7.91E-02	(11° C)	9.48E-02	1.28E-02	1.28E-02

Notes:

atm m³/mol - atmosphere cubic meter per mole

cm²/s - square centimeter per second

g/cm³ - gram per cubic centimeter

cm - centimeter

cm/s - centimeter per second

(1) Chemical properties were obtained from the chemical properties database implemented in USEPA (2004). The Henry's Law constant and air diffusion coefficient were corrected for an average vadose zone temperature of 11°C. The reference temperature for the water diffusion coefficient is 25°C and, considering its low value, a correction to 11°C was considered negligible.

(2) The Henry's Law Constant $H' = H_L/(T*R)$, where T is the vadose zone temperature in degrees Kelvin and the universal gas constant R is 8.21E-05 atm m³/mol K.

(4) The Effective Diffusion Coefficient in soil is calculated from $D_s^{eff} = (D_{air} * \varepsilon_v^{3.33} / (\upsilon_T/100)^2) + (D_{H2O} / H' * \varepsilon_m^{3.33} / (\varepsilon_T/100)^2)$.

(5) The Effective Diffusion Coefficient between soil gas and the soil surface is calculated from $D_{ws}^{eff} = h_v / (h_v / D_s^{eff})$.

(6) The calculation of the Volatilization Factor (VF_{sgamb}) is calculated from $VF_{sgamb} = 1 / (1 + (U_a * \delta_{air} * L_{GW} / (W * D_{ws}^{eff})))$.

Vadose Zone Properties:

Total Porosity, υ_T (%)	37.5	Default porosity for a sand soil type as implemented in USEPA (2004).
Vadose zone Moisture-Filled Porosity, ε_m	0.054	Default moisture-filled porosity for a sand soil type, as implemented in USEPA (2004).
Vadose Zone Vapor-Filled Porosity, ε_v	0.321	Vapor-filled porosity, $\varepsilon_v = \upsilon_T / 100 - \varepsilon_m$
Dry Bulk Soil Density, ρ_{dry} (g/cm³)	1.66	Default dry bulk density for a sand soil type, as implemented in USEPA (2004).
Vadose Zone Temperature (°C)	11	Based on average shallow groundwater temperature in Ohio, as presented in USEPA (2004; Figure 8).
Thickness of Vadose Zone (h_v) (cm)	91	Conservatively applied minimum depth to top of soil vapor screens of 3 feet (0.91 m), as indicated in Table C.1 of Ap
Depth to Soil Gas (L_{sg}) (cm)	91	Conservatively applied minimum depth to top of soil vapor screens of 3 feet (0.91 m), as indicated in Table C.1 of Ap
Wind Speed, U_a (cm/s)	225	Default wind speed above ground surface in ambient mixing zone (ASTM, 2002).
Ambient Air Mixing Zone Height, δ_{air}(cm)	200	Default height of ambient air mixing zone (ASTM, 2002).
Width of Source Area, W (cm)	54864	Approximated based on the width of the Site (1,800 ft).

VF_{spamb} (unitless) (5)
1.49E-04
1.80E-04
1.38E-04
1.76E-04
1.46E-04
1.46E-04
5.43E-04
2.09E-04
1.48E-04
1.60E-04
1.33E-04
1.50E-04
1.30E-04
2.05E-04
2.03E-04
1.18E-04
1.44E-04
1.74E-04
1.42E-04
1.58E-04
1.74E-04
2.13E-04
1.70E-04

ppendix C.
ppendix C.

TABLE B.3.3

EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN SOIL GAS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Soil Gas
Exposure Medium: Indoor Air/ Ambient Air

Chemicals of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs												
1,1-Dichloroethane	µg/m³	5.37E+02	(3)	7.20E+03		µg/m³	1.17E+03	95% UCL-N	W-Test (4)	1.17E+03	95% UCL-N	W-Test (4)
1,1-Dichloroethene	µg/m³	4.59E+01	(3)	4.20E+02		µg/m³	6.15E+01	95% UCL-N	W-Test (4)	6.15E+01	95% UCL-N	W-Test (4)
1,4-Dichlorobenzene	µg/m³	7.31E+01	(1)	1.90E+00	J	µg/m³	2.12E+00	95% UCL-N	W-Test (4)	2.12E+00	95% UCL-N	W-Test (4)
Benzene	µg/m³	7.46E+02	(2)	1.40E+04		µg/m³	7.40E+03	95% UCL-NP	W-Test (4)	7.40E+03	95% UCL-NP	W-Test (4)
Bromomethane	µg/m³	4.69E+01	(1)	8.50E+00	J	µg/m³	8.50E+00	95% UCL-N	W-Test (4)	8.50E+00	95% UCL-N	W-Test (4)
Chlorobenzene	µg/m³	5.98E+02	(1)	1.20E+04		µg/m³	6.78E+03	95% UCL-NP	W-Test (4)	6.78E+03	95% UCL-NP	W-Test (4)
Chloroethane	µg/m³	1.19E+02	(3)	1.40E+03		µg/m³	2.29E+02	95% UCL-N	W-Test (4)	2.29E+02	95% UCL-N	W-Test (4)
Chloroform	µg/m³	4.17E+01	(3)	1.50E+02		µg/m³	3.11E+01	95% UCL-N	W-Test (4)	3.11E+01	95% UCL-N	W-Test (4)
cis-1,2-Dichloroethene	µg/m³	1.07E+03	(2)	1.60E+04		µg/m³	8.87E+03	95% UCL-NP	W-Test (4)	8.87E+03	95% UCL-NP	W-Test (4)
Cyclohexane	µg/m³	2.52E+03	(2)	5.00E+04		µg/m³	2.70E+04	95% UCL-NP	W-Test (4)	2.70E+04	95% UCL-NP	W-Test (4)
Dichlorodifluoromethane	µg/m³	1.25E+02	(2)	1.40E+03	J	µg/m³	7.51E+02	95% UCL-NP	W-Test (4)	7.51E+02	95% UCL-NP	W-Test (4)
Ethylbenzene	µg/m³	2.36E+03	(1)	4.80E+04		µg/m³	2.53E+04	95% UCL-NP	W-Test (4)	2.53E+04	95% UCL-NP	W-Test (4)
Isopropylbenzene	µg/m³	2.25E+02	4.10E+03	4.10E+03		µg/m³	4.10E+03	95% UCL-N	W-Test (4)	4.10E+03	95% UCL-N	W-Test (4)
Methyl Tert Butyl Ether	µg/m³	2.60E+01	3.80E+01	3.80E+01		µg/m³	3.80E+01	95% UCL-N	W-Test (4)	3.80E+01	95% UCL-N	W-Test (4)
Methylene chloride	µg/m³	2.27E+01	(3)	5.90E+01	J	µg/m³	1.11E+01	95% UCL-N	W-Test (4)	1.11E+01	95% UCL-N	W-Test (4)
Naphthalene	µg/m³	1.03E+02	(1)	9.80E+02	J	µg/m³	3.73E+02	95% UCL-NP	W-Test (4)	3.73E+02	95% UCL-NP	W-Test (4)
Tetrachloroethene	µg/m³	9.70E+01	(3)	6.10E+02		µg/m³	1.25E+02	95% UCL-N	W-Test (4)	1.25E+02	95% UCL-N	W-Test (4)
Toluene	µg/m³	1.94E+02	(1)	2.80E+03		µg/m³	1.53E+03	95% UCL-NP	W-Test (4)	1.53E+03	95% UCL-NP	W-Test (4)
trans-1,2-Dichloroethene	µg/m³	3.85E+01	2.20E+02	3.10E+02	J	µg/m³	2.20E+02	95% UCL-N	W-Test (4)	2.20E+02	95% UCL-N	W-Test (4)
Trichloroethene	µg/m³	2.94E+03	(2)	5.60E+04		µg/m³	2.96E+04	95% UCL-NP	W-Test (4)	2.96E+04	95% UCL-NP	W-Test (4)
Trichlorofluoromethane	µg/m³	4.06E+01	(1)	7.40E+01		µg/m³	1.91E+01	95% UCL-N	W-Test (4)	1.91E+01	95% UCL-N	W-Test (4)
Vinyl chloride	µg/m³	1.46E+03	(3)	1.40E+04		µg/m³	2.77E+03	95% UCL-N	W-Test (4)	2.77E+03	95% UCL-N	W-Test (4)
Xylenes (total)	µg/m³	2.30E+03	(1)	4.70E+04		µg/m³	2.47E+04	95% UCL-NP	W-Test (4)	2.47E+04	95% UCL-NP	W-Test (4)

Notes:
J = Estimated.
VOCs - Volatile Organic Compounds
µg/m³ - microgram per cubic meter
UCL - Upper Confidence Limit
EPC - Exposure Point Concentration
For data sets with non-detects, the Kaplan-Meier method was used (per USEPA 2006).
W-Test : Developed by Shapiro and Wilk for data sets with under 50 samples.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N);
95% UCL of Log-transformed Data (95% UCL-L); 95% UCL of Gamma distributed data (95% UCL-G);
Non-parametric method used to Determine 95% UCL (95% UCL-NP).

TABLE B.3.4

EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Chemicals of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
SVOCs												
Benzo(a)anthracene	µg/kg	1.07E+03	(3)	8.50E+03		µg/kg	3.13E+03	95% UCL-NP	W-Test (4)	3.13E+03	95% UCL-NP	W-Test (4)
Benzo(a)pyrene	µg/kg	8.19E+02	(3)	5.70E+03		µg/kg	1.60E+03	95% UCL-NP	W-Test (4)	1.60E+03	95% UCL-NP	W-Test (4)
Benzo(b)fluoranthene	µg/kg	1.35E+03	(3)	9.50E+03		µg/kg	3.69E+03	95% UCL-NP	W-Test (4)	3.69E+03	95% UCL-NP	W-Test (4)
Benzo(k)fluoranthene	µg/kg	8.03E+02	(3)	6.40E+03		µg/kg	1.43E+03	95% UCL-N	W-Test (4)	1.43E+03	95% UCL-N	W-Test (4)
Dibenz(a,h)anthracene	µg/kg	3.03E+02	(3)	1.60E+03		µg/kg	4.58E+02	95% UCL-N	W-Test (4)	4.58E+02	95% UCL-N	W-Test (4)
Indeno(1,2,3-cd) pyrene	µg/kg	6.99E+02	(3)	5.00E+03		µg/kg	1.32E+03	95% UCL-NP	W-Test (4)	1.32E+03	95% UCL-NP	W-Test (4)
Metals												
Aluminum	µg/kg	6.15E+06	7.32E+06	1.43E+07		µg/kg	7.32E+06	95% UCL-N	W-Test (4)	7.32E+06	95% UCL-N	W-Test (4)
Antimony	µg/kg	1.70E+04	(3)	2.78E+05		µg/kg	3.91E+04	95% UCL-N	W-Test (4)	3.91E+04	95% UCL-N	W-Test (4)
Arsenic	µg/kg	2.57E+04	(2)	1.41E+05		µg/kg	5.13E+04	95% UCL-L	W-Test (4)	5.13E+04	95% UCL-L	W-Test (4)
Barium	µg/kg	8.03E+05	(1)	1.30E+07		µg/kg	6.60E+06	95% UCL-NP	W-Test (4)	6.60E+06	95% UCL-NP	W-Test (4)
Cadmium	µg/kg	3.31E+03	(3)	1.63E+04		µg/kg	7.72E+03	95% UCL-NP	W-Test (4)	7.72E+03	95% UCL-NP	W-Test (4)
Cobalt	µg/kg	8.40E+03	(3)	2.21E+04		µg/kg	1.05E+04	95% UCL-NP	W-Test (4)	1.05E+04	95% UCL-NP	W-Test (4)
Copper	µg/kg	9.15E+06	(1)	1.91E+08		µg/kg	9.53E+07	95% UCL-NP	W-Test (4)	9.53E+07	95% UCL-NP	W-Test (4)
Iron	µg/kg	2.26E+07	(2)	9.23E+07		µg/kg	3.80E+07	95% UCL-N	W-Test (4)	3.80E+07	95% UCL-N	W-Test (4)
Lead	µg/kg	9.91E+05	(2)	1.21E+07		µg/kg	3.51E+06	95% UCL-L	W-Test (4)	3.51E+06	95% UCL-L	W-Test (4)
Manganese	µg/kg	3.04E+05	3.84E+05	6.93E+05		µg/kg	3.84E+05	95% UCL-N	W-Test (4)	3.84E+05	95% UCL-N	W-Test (4)
Nickel	µg/kg	6.56E+04	(1)	4.02E+05		µg/kg	2.67E+05	95% UCL-NP	W-Test (4)	2.67E+05	95% UCL-NP	W-Test (4)
Vanadium	µg/kg	2.94E+04	(3)	9.26E+04		µg/kg	3.97E+04	95% UCL-G	W-Test (4)	3.97E+04	95% UCL-G	W-Test (4)
Zinc	µg/kg	9.20E+05	(2)	1.15E+07		µg/kg	2.08E+06	95% UCL-L	W-Test (4)	2.08E+06	95% UCL-L	W-Test (4)
PCBs												
Aroclor-1248 (PCB-1248)	µg/kg	2.93E+02	1.63E+03	4.20E+03		µg/kg	1.63E+03	95% UCL-N	W-Test (4)	1.63E+03	95% UCL-N	W-Test (4)
Aroclor-1254 (PCB-1254)	µg/kg	9.40E+01	8.30E+02	8.30E+02		µg/kg	8.30E+02	95% UCL-N	W-Test (4)	8.30E+02	95% UCL-N	W-Test (4)
Aroclor-1260 (PCB-1260)	µg/kg	3.26E+02	(3)	2.80E+03		µg/kg	5.54E+02	95% UCL-N	W-Test (4)	5.54E+02	95% UCL-N	W-Test (4)
Dioxins/Furans												
Total TEQ	pg/g	–	–	1.20E+01		pg/g	1.20E+01	Max	(5)	1.20E+01	Max	(5)

Notes:
SVOCs - Semi Volatile Organic Compounds
µg/kg- microgram per kilogram
PCBs - Polychlorinated biphenyls
UCL - Upper Confidence Limit
EPC - Exposure Point Concentration
TEQ - Toxicity Equivalent
pg/g - picogram per gram
For data sets with non-detects, the Kaplan-Meier method was used (per USEPA 2006).
W-Test : Developed by Shapiro and Wilk for data sets with under 50 samples.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N);
95% UCL of Log-transformed Data (95% UCL-L); 95% UCL of Gamma distributed data (95% UCL-G);

TABLE B.3.5

EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN SURFACE AND SUBSURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface and Subsurface Soil (0-15 ft bgs)
Exposure Medium: Soil

Chemicals of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs												
Benzene	µg/kg	2.22E+02	(3)	1.20E+04		µg/kg	5.27E+02	95% UCL-N	W-Test (4)	5.27E+02	95% UCL-N	W-Test (4)
Ethylbenzene	µg/kg	3.76E+03	(3)	1.70E+05		µg/kg	8.62E+03	95% UCL-N	W-Test (4)	8.62E+03	95% UCL-N	W-Test (4)
Tetrachloroethene	µg/kg	1.44E+02	(2)	2.50E+03	J	µg/kg	1.90E+02	95% UCL-NP	W-Test (4)	1.90E+02	95% UCL-NP	W-Test (4)
Vinyl chloride	µg/kg	1.32E+02	1.32E+02	2.20E+02	J	µg/kg	1.32E+02	95% UCL-N	W-Test (4)	1.32E+02	95% UCL-N	W-Test (4)
Xylenes (total)	µg/kg	6.98E+03	(1)	4.80E+05		µg/kg	4.72E+04	95% UCL-NP	W-Test (4)	4.72E+04	95% UCL-NP	W-Test (4)
SVOCs												
Benzo(a)anthracene	µg/kg	7.13E+02	(2)	8.50E+03		µg/kg	1.93E+03	95% UCL-NP	W-Test (4)	1.93E+03	95% UCL-NP	W-Test (4)
Benzo(a)pyrene	µg/kg	5.57E+02	(2)	6.00E+03		µg/kg	1.44E+03	95% UCL-NP	W-Test (4)	1.44E+03	95% UCL-NP	W-Test (4)
Benzo(b)fluoranthene	µg/kg	8.59E+02	(2)	9.50E+03		µg/kg	2.23E+03	95% UCL-NP	W-Test (4)	2.23E+03	95% UCL-NP	W-Test (4)
Benzo(k)fluoranthene	µg/kg	4.23E+02	(2)	6.40E+03		µg/kg	1.16E+03	95% UCL-NP	W-Test (4)	1.16E+03	95% UCL-NP	W-Test (4)
Dibenz(a,h)anthracene	µg/kg	1.43E+02	(3)	1.60E+03		µg/kg	1.60E+02	95% UCL-N	W-Test (4)	1.60E+02	95% UCL-N	W-Test (4)
Indeno(1,2,3-cd) pyrene	µg/kg	3.90E+02	(3)	5.00E+03		µg/kg	5.97E+02	95% UCL-NP	W-Test (4)	5.97E+02	95% UCL-NP	W-Test (4)
Naphthalene	µg/kg	4.35E+02	(1)	1.90E+04		µg/kg	1.54E+03	95% UCL-NP	W-Test (4)	1.54E+03	95% UCL-NP	W-Test (4)
Metals												
Aluminum	µg/kg	6.03E+06	(3)	2.17E+07		µg/kg	6.71E+06	95% UCL-G	W-Test (4)	6.71E+06	95% UCL-G	W-Test (4)
Antimony	µg/kg	2.30E+04	(1)	6.69E+05	B	µg/kg	8.45E+04	95% UCL-NP	W-Test (4)	8.45E+04	95% UCL-NP	W-Test (4)
Arsenic	µg/kg	1.82E+04	(2)	1.41E+05		µg/kg	2.22E+04	95% UCL-N	W-Test (4)	2.22E+04	95% UCL-N	W-Test (4)
Barium	µg/kg	6.46E+05	(2)	1.30E+07		µg/kg	7.84E+05	95% UCL-L	W-Test (4)	7.84E+05	95% UCL-L	W-Test (4)
Cadmium	µg/kg	4.62E+03	(1)	4.61E+04	B	µg/kg	1.14E+04	95% UCL-NP	W-Test (4)	1.14E+04	95% UCL-NP	W-Test (4)
Cobalt	µg/kg	1.33E+04	(1)	3.17E+05		µg/kg	2.83E+04	95% UCL-NP	W-Test (4)	2.83E+04	95% UCL-NP	W-Test (4)
Copper	µg/kg	4.23E+06	(1)	1.91E+08		µg/kg	2.97E+07	95% UCL-NP	W-Test (4)	2.97E+07	95% UCL-NP	W-Test (4)
Iron	µg/kg	2.47E+07	(1)	1.35E+08		µg/kg	4.53E+07	95% UCL-NP	W-Test (4)	4.53E+07	95% UCL-NP	W-Test (4)
Lead	µg/kg	1.11E+06	(1)	1.77E+07		µg/kg	4.53E+06	95% UCL-NP	W-Test (4)	4.53E+06	95% UCL-NP	W-Test (4)
Manganese	µg/kg	3.45E+05	(3)	2.20E+06		µg/kg	5.08E+05	95% UCL-NP	W-Test (4)	5.08E+05	95% UCL-NP	W-Test (4)
Mercury	µg/kg	3.94E+02	(1)	2.60E+03		µg/kg	1.26E+03	95% UCL-NP	W-Test (4)	1.26E+03	95% UCL-NP	W-Test (4)
Nickel	µg/kg	5.56E+04	(1)	4.75E+05		µg/kg	1.25E+05	95% UCL-NP	W-Test (4)	1.25E+05	95% UCL-NP	W-Test (4)
Vanadium	µg/kg	2.43E+04	(3)	9.26E+04		µg/kg	2.73E+04	95% UCL-G	W-Test (4)	2.73E+04	95% UCL-G	W-Test (4)
Zinc	µg/kg	1.15E+06	(1)	2.19E+07	B	µg/kg	3.72E+06	95% UCL-NP	W-Test (4)	3.72E+06	95% UCL-NP	W-Test (4)
PCBs												
Aroclor-1248 (PCB-1248)	µg/kg	3.19E+02	(3)	8.10E+03		µg/kg	4.91E+02	95% UCL-N	W-Test (4)	4.91E+02	95% UCL-N	W-Test (4)
Aroclor-1254 (PCB-1254)	µg/kg	4.81E+02	(2)	2.10E+04		µg/kg	1.81E+03	95% UCL-NP	W-Test (4)	1.81E+03	95% UCL-NP	W-Test (4)
Aroclor-1260 (PCB-1260)	µg/kg	1.96E+02	(3)	2.80E+03		µg/kg	2.30E+02	95% UCL-N	W-Test (4)	2.30E+02	95% UCL-N	W-Test (4)
Pesticides												
Dieldrin	µg/kg	3.32E+01	(3)	2.70E+02	J	µg/kg	3.15E+01	95% UCL-N	W-Test (4)	3.15E+01	95% UCL-N	W-Test (4)

TABLE B.3.5

EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN SURFACE AND SUBSURFACE SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Surface and Subsurface Soil (0-15 ft bgs)
Exposure Medium: Soil

Chemicals of Potential Concern	*Units*	*Arithmetic Mean*	*95% UCL of Normal Data*	*Maximum Detected Concentration*	*Maximum Qualifier*	*EPC Units*	*Reasonable Maximum Exposure*			*Central Tendency*		
							Medium EPC Value	*Medium EPC Statistic*	*Medium EPC Rationale*	*Medium EPC Value*	*Medium EPC Statistic*	*Medium EPC Rationale*
Dioxins/Furans												
Total TEQ	pg/g	--	--	1.20E+01		pg/g	1.20E+01	Max	(5)	1.20E+01	Max	(5)

Notes:
J = Estimated.
B = Method blank contamination.
VOCs - Volatile Organic Compounds
SVOCs - Semi Volatile Organic Compounds
µg/kg- microgram per kilogram
PCBs - Polychlorinated biphenyls
ft bgs - feet below ground surface
UCL - Upper Confidence Limit
TEQ - Toxicity Equivalent
pg/g - picogram per gram
EPC - exposure point concentration
For data sets with non-detects, the Kaplan-Meier method was used (per USEPA 2006).
W-Test: Developed by Shapiro and Francia for data sets with over 50 samples but under 100 samples.

TABLE B.3.6

EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN GROUNDWATER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Chemicals of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
VOCs												
1,1-Dichloroethane	µg/L	5.47E+01	(1)	2.00E+04		µg/L	2.14E+02	95% UCL-NP	W-Test (4)	2.14E+02	95% UCL-NP	W-Test (4)
1,2-Dichloroethane	µg/L	1.05E+00	(2)	3.40E+01		µg/L	1.41E+00	95% UCL-NP	W-Test (4)	1.41E+00	95% UCL-NP	W-Test (4)
Benzene	µg/L	5.08E+00	(1)	5.80E+02		µg/L	1.07E+01	95% UCL-NP	W-Test (4)	1.07E+01	95% UCL-NP	W-Test (4)
Chlorobenzene	µg/L	1.88E+00	(3)	1.30E+02		µg/L	2.03E+00	95% UCL-N	W-Test (4)	2.03E+00	95% UCL-N	W-Test (4)
Chloroform	µg/L	1.17E+00	(3)	3.10E+00		µg/L	5.59E-01	95% UCL-N	W-Test (4)	5.59E-01	95% UCL-N	W-Test (4)
cis-1,2-Dichloroethene (5)	µg/L	2.80E+01	(1)	3.90E+03	J	µg/L	9.51E+01	95% UCL-NP	W-Test (4)	9.51E+01	95% UCL-NP	W-Test (4)
Dibromochloromethane	µg/L	1.16E+00	1.00E+00	7.60E-01	J	µg/L	1.00E+00	95% UCL-N	W-Test (4)	1.00E+00	95% UCL-N	W-Test (4)
Ethylbenzene	µg/L	1.61E+00	(1)	8.90E+01		µg/L	1.98E+00	95% UCL-NP	W-Test (4)	1.98E+00	95% UCL-NP	W-Test (4)
Methylene chloride	µg/L	1.29E+00	(3)	5.10E+01	B	µg/L	1.27E+00	95% UCL-N	W-Test (4)	1.27E+00	95% UCL-N	W-Test (4)
Tetrachloroethene	µg/L	9.85E-01	(1)	4.60E+00		µg/L	5.44E-01	95% UCL-NP	W-Test (4)	5.44E-01	95% UCL-NP	W-Test (4)
Trichloroethene	µg/L	2.62E+01	(2)	5.10E+03		µg/L	8.67E+01	95% UCL-NP	W-Test (4)	8.67E+01	95% UCL-NP	W-Test (4)
Vinyl chloride	µg/L	9.97E+00	(1)	7.60E+02		µg/L	1.99E+01	95% UCL-NP	W-Test (4)	1.99E+01	95% UCL-NP	W-Test (4)
Xylenes (total)	µg/L	2.30E+00	(1)	7.50E+01		µg/L	2.01E+00	95% UCL-NP	W-Test (4)	2.01E+00	95% UCL-NP	W-Test (4)
SVOCs												
2-Methylnaphthalene	µg/L	8.48E-01	(1)	5.60E+01		µg/L	1.97E+00	95% UCL-N	W-Test (4)	1.97E+00	95% UCL-N	W-Test (4)
bis(2-Ethylhexyl)phthalate	µg/L	1.48E+00	(3)	7.90E+00		µg/L	1.63E+00	95% UCL-N	W-Test (4)	1.63E+00	95% UCL-N	W-Test (4)
Naphthalene	µg/L	6.23E-01	(3)	1.70E+01		µg/L	9.39E-01	95% UCL-N	W-Test (4)	9.39E-01	95% UCL-N	W-Test (4)
Metals												
Aluminum	µg/L	5.19E+02	(1)	1.00E+04		µg/L	1.03E+03	95% UCL-N	W-Test (4)	1.03E+03	95% UCL-N	W-Test (4)
Antimony	µg/L	1.12E+00	(1)	6.70E+00		µg/L	9.08E-01	95% UCL-N	W-Test (4)	9.08E-01	95% UCL-N	W-Test (4)
Arsenic	µg/L	7.42E+00	(1)	4.76E+01		µg/L	1.39E+01	95% UCL-NP	W-Test (4)	1.39E+01	95% UCL-NP	W-Test (4)
Barium	µg/L	3.02E+02	(1)	2.22E+03		µg/L	5.58E+02	95% UCL-NP	W-Test (4)	5.58E+02	95% UCL-NP	W-Test (4)
Cobalt	µg/L	2.05E+01	6.02E+00	1.23E+01	B	µg/L	6.02E+00	95% UCL-N	W-Test (4)	6.02E+00	95% UCL-N	W-Test (4)
Iron	µg/L	1.98E+03	(3)	2.06E+04		µg/L	4.11E+03	95% UCL-NP	W-Test (4)	4.11E+03	95% UCL-NP	W-Test (4)
Lead	µg/L	3.24E+00	(1)	1.00E+02		µg/L	9.13E+00	95% UCL-NP	W-Test (4)	9.13E+00	95% UCL-NP	W-Test (4)
Manganese	µg/L	2.67E+02	(3)	1.08E+03		µg/L	3.81E+02	95% UCL-G	W-Test (4)	3.81E+02	95% UCL-G	W-Test (4)
Selenium	µg/L	3.90E+00	6.00E+00	2.53E+01		µg/L	6.00E+00	95% UCL-N	W-Test (4)	6.00E+00	95% UCL-N	W-Test (4)
Vanadium	µg/L	2.27E+01	2.42E+01	2.42E+01	J	µg/L	2.42E+01	95% UCL-N	W-Test (4)	2.42E+01	95% UCL-N	W-Test (4)
PCBs												
Aroclor-1260 (PCB-1260)	µg/L	1.41E-01	(1)	1.90E-01	J	µg/L	2.00E-01	95% UCL-N	W-Test (4)	2.00E-01	95% UCL-N	W-Test (4)
Pesticides												
Heptachlor	µg/L	2.37E-02	(1)	5.10E-02	PJ	µg/L	4.63E-02	95% UCL-NP	W-Test (4)	4.63E-02	95% UCL-NP	W-Test (4)

Notes:
J = Estimated.
B = Method blank contamination.
P = Difference for detected Aroclor > 25% between 2 GC column.
VOCs - Volatile Organic Compounds
SVOCs - Semi Volatile Organic Compounds
µg/L - microgram per liter
PCBs - Polychlorinated Biphenyls
UCL - Upper Confidence Limit
EPC - Exposure Point Concentration
For data sets with non-detects, the Kaplan-Meier method was used (per USEPA 2006).
W-Test: Developed by Shapiro and Francia for data sets with over 50 samples but under 100 samples.
Statistics: Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N);
95% UCL of Log-transformed Data (95% UCL-L); 95% UCL of Gamma distributed data (95% UCL-G);

TABLE B.3.6

EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN GROUNDWATER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Groundwater
Exposure Medium: Groundwater

Chemicals of Potential Concern	*Units*	*Arithmetic Mean*	*95% UCL of Normal Data*	*Maximum Detected Concentration*	*Maximum Qualifier*	*EPC Units*	*Reasonable Maximum Exposure*			*Central Tendency*		
							Medium EPC Value	*Medium EPC Statistic*	*Medium EPC Rationale*	*Medium EPC Value*	*Medium EPC Statistic*	*Medium EPC Rationale*

Non-parametric method used to Determine 95% UCL (95% UCL-NP).

TABLE B.3.7

EXPOSURE POINT CONCENTRATION (EPC) SUMMARY FOR CHEMICALS OF POTENTIAL CONCERN IN SEDIMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Chemicals of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
SVOCs												
Benzo(a)anthracene	µg/kg	–	–	1.50E+03		µg/kg	1.50E+03	Max	(1)	1.50E+03	Max	(1)
Benzo(a)pyrene	µg/kg	–	–	1.80E+03		µg/kg	1.80E+03	Max	(1)	1.80E+03	Max	(1)
Benzo(b)fluoranthene	µg/kg	–	–	2.50E+03		µg/kg	2.50E+03	Max	(1)	2.50E+03	Max	(1)
Dibenz(a,h)anthracene	µg/kg	–	–	4.80E+02	J	µg/kg	4.80E+02	Max	(1)	4.80E+02	Max	(1)
Indeno(1,2,3-cd) pyrene	µg/kg	–	–	1.90E+03		µg/kg	1.90E+03	Max	(1)	1.90E+03	Max	(1)
Metals												
Arsenic	µg/kg	–	–	1.26E+04		µg/kg	1.26E+04	Max	(1)	1.26E+04	Max	(1)
Cobalt	µg/kg	–	–	6.70E+03	J	µg/kg	6.70E+03	Max	(1)	6.70E+03	Max	(1)
Iron	µg/kg	–	–	1.35E+07		µg/kg	1.35E+07	Max	(1)	1.35E+07	Max	(1)
Manganese	µg/kg	–	–	5.45E+05		µg/kg	5.45E+05	Max	(1)	5.45E+05	Max	(1)
PCBs												
Aroclor-1254 (PCB-1254)	µg/kg	–	–	6.60E+02		µg/kg	6.60E+02	Max	(1)	6.60E+02	Max	(1)

Notes:
J = Estimated.
SVOCs - Semi Volatile Organic Compounds
µg/kg- microgram per kilogram
PCBs - Polychlorinated biphenyls
UCL - Upper Confidence Limit

TABLE B.4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR INDOOR AIR - CURRENT/ FUTURE ON/OFF-SITE INDUSTRIAL/ COMMERCIAL WORKER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Soil Gas/ Groundwater
Exposure Medium: Indoor Air
Exposure Point: Inhalation
Receptor Population: On/Off-Site Industrial/ Commercial Worker
Receptor Age: Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Inhalation	CIA	Chemical Concentration in Indoor Air	mg/m^3	(1)	(1)	(1)	(1)	CDI (mg/m^3) =
	FT	Fraction Time Exposed	unitless	8/24	Professional Judgment (2)	8/24	Professional Judgment (2)	CIA x FT x EF x ED x x 1/AT
	EF	Exposure Frequency	days/year	250	USEPA, 2004	219	USEPA, 2004	
	ED	Exposure Duration	years	25	USEPA, 2004	9	USEPA, 2004	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	9,125	USEPA, 1989	3,285	USEPA, 1989	

Notes:
CDI - Chronic Daily Intake
CT - Central Tendency
RME - Reasonable Maximum Exposure
mg/m^3 - milligram per cubic meter
(1) For modeled indoor air concentrations, refer to Appendix C.
(2) Professional Judgment; assumed 8 hour work day.

References:

USEPA, 1989: Risk Assessment Guidance for Superfund (RAGS): Volume 1 – Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989.
USEPA, 2004: Risk Assessment Guidance for Superfund (RAGS):Volume 1 - Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), EPA/540/R/99/005, July 2004.

TABLE B.4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR AMBIENT AIR - CURRENT/ FUTURE ON-SITE TRESPASSER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Soil Gas
Exposure Medium: Ambient Air
Exposure Point: Inhalation
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Inhalation	CAA	Chemical Concentration in Ambient Air	mg/m^3	(1)	(1)	(1)	(1)	CDI (mg/m^3) =
	FT	Fraction Time Exposed	unitless	3.4/24	USEPA, 2008 (2)	1.7/24	USEPA, 2008 (2)	CAA x FT x EF x ED x 1/AT
	EF	Exposure Frequency	days/year	50.6	USEPA, 2008 (3)	25.3	USEPA, 2008 (3)	
	ED	Exposure Duration	years	10	USEPA, 2000 (4)	10	USEPA, 2000 (4)	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	3,650	USEPA, 1989	3,650	USEPA, 1989	

Notes:
CDI - Chronic Daily Intake
CT - Central Tendency
RME - Reasonable Maximum Exposure
mg/m^3 - miligram per cubic meter
(1) For modeled ambient air concentrations, refer to Table B.4.4.
(2) The basis for the FT is the 50th percentile from Table 16-1, Recommended Values for Activity Factors - Time Outdoors (total).
The time spent outdoors for 6-11 years old of 100 min/day equates to 1.7 hrs (CT) [100/60]. The RME is double the CT value for 3.4 hrs.
(3) The basis for the EF is the 50th percentile from Table 16-1, Recommended Values for Activity Factors - Time Outdoors (total).
The time spent outdoors for 6-11 years old of 100 min/day from out of a possible 365 days equates to 25.3 days (CT) [(100 min/d /1440 total min/d)*365]. The RME is double the CT value for 50.6 days.
(4) Trespasser is a 7 through 16 year old therefore the exposure duration is 10 years, based on USEPA Region 4 (2000).

TABLE B.4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR AMBIENT AIR - CURRENT/ FUTURE ON/OFF SITE INDUSTRIAL/ COMMERCIAL WORKER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Soil Gas
Exposure Medium: Ambient Air
Exposure Point: Inhalation
Receptor Population: On/Off Site Industrial/ Commercial Worker
Receptor Age: Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Inhalation	CIA	Chemical Concentration in Indoor Air	mg/m^3	(1)	(1)	(1)	(1)	CDI (mg/m^3) =
	FT	Fraction Time Exposed	unitless	8/24	Professional Judgment (2)	8/24	Professional Judgment (2)	CIA x FT x EF x ED x x 1/AT
	EF	Exposure Frequency	days/year	250	USEPA, 2004	219	USEPA, 2004	
	ED	Exposure Duration	years	25	USEPA, 2004	9	USEPA, 2004	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	9,125	USEPA, 1989	3,285	USEPA, 1989	

Notes:
CDI - Chronic Daily Intake
CT - Central Tendency
RME - Reasonable Maximum Exposure
mg/m^3 - milligram per cubic meter
(1) For modeled ambient air concentrations, refer to Table B.4.4.
(2) Professional Judgment; assumed 8 hour work day.

References:

USEPA, 1989: Risk Assessment Guidance for Superfund (RAGS): Volume 1 – Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989.
USEPA, 2004: Risk Assessment Guidance for Superfund (RAGS): Volume 1 - Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), EPA/540/R/99/005, July 2004.

TABLE B.4.4

CALCULATION OF SOIL GAS TO AMBIENT AIR CONCENTRATIONS FOR TRESPASSER AND INDUSTRIAL/COMMERCIAL WORKER INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	Chemical Properties (1): Henry's Law Constant, H_L (atm m³/mol) (1)		Water Diffusion Coefficient, D_{H2O} (cm²/s) (1)		Air Diffusion Coefficient, D_{air} (cm²/s) (1)		Henry's Law Constant, H' (unitless) (2)	D_s^{eff} (cm²/sec) (3)	D_{ws}^{eff} (cm²/sec) (4)	VF_{sgamb} (unitless) (5)	Soil Gas Concentration (µg/m³) (6)	Soil Gas to Ambient Air Concentration, C_{aa} (µg/m³) (7)
Benzene	2.82E-03	(11° C)	9.80E-06	(25° C)	8.19E-02	(11° C)	1.21E-01	1.32E-02	1.32E-02	1.76E-04	7.40E+03	1.31E+00
Ethylbenzene	3.38E-03	(11° C)	7.80E-06	(25° C)	6.98E-02	(11° C)	1.45E-01	1.13E-02	1.13E-02	1.50E-04	2.53E+04	3.80E+00
Naphthalene	1.65E-04	(11° C)	7.50E-06	(25° C)	5.49E-02	(11° C)	7.07E-03	8.87E-03	8.87E-03	1.18E-04	3.73E+02	4.41E-02
Trichloroethene	5.05E-03	(11° C)	9.10E-06	(25° C)	7.35E-02	(11° C)	2.17E-01	1.19E-02	1.19E-02	1.58E-04	2.96E+04	4.68E+00
Vinyl chloride	1.78E-02	(11° C)	1.23E-05	(25° C)	9.86E-02	(11° C)	7.63E-01	1.59E-02	1.59E-02	2.13E-04	2.77E+03	5.88E-01

Notes:

atm m³/mol - atmosphere cubic meter per mole

cm²/s - square centimeter per second

g/cm³ - gram per cubic centimeter

cm - centimeter

cm/s - centimeter per second

µg/m³- microgram per cubic meter

(1) Chemical properties were obtained from the chemical properties database implemented in USEPA (2004). The Henry's Law constant and air diffusion coefficient were corrected for an average vadose zone temperature of 11 °C. The reference temperature for the water diffusion coefficient is 25°C and, considering its low value, a correction to 11°C was considered negligible.

(2) The Henry's Law Constant $H' = H_L/(T*R)$, where T is the vadose zone temperature in degrees Kelvin and the universal gas constant R is 8.21E-05 atm m³/mol K.

(3) The Effective Diffusion Coefficient in soil is calculated from $D_s^{eff} = (D_{air} * \varepsilon_v^{3.33} / (\varepsilon_T/100)^2) + (D_{H2O} / H' * \varepsilon_m^{3.33} / (\varepsilon_T/100)^2)$.

(4) The Effective Diffusion Coefficient between soil gas and the soil surface is calculated from $D_{ws}^{eff} = h_v / (h_v / D_s^{eff})$.

(5) The calculation of the Volatilization Factor (VF_{sgamb}) is calculated from $VF_{sgamb} = 1 / (1 + (U_a * \delta_{air} * L_{GW} / (W * D_{ws}^{eff})))$.

Vadose Zone Properties:		
Total Porosity, ε_T (%)	37.5	Default porosity for a sand soil type as implemented in USEPA (2004).
Vadose zone Moisture-Filled Porosity, ε_m	0.054	Default moisture-filled porosity for a sand soil type, as implemented in USEPA (2004).
Vadose Zone Vapor-Filled Porosity, ε_v	0.321	Vapor-filled porosity, $\varepsilon_v = \varepsilon_T / 100 - \varepsilon_m$
Dry Bulk Soil Density, ρ_{db} (g/cm³)	1.66	Default dry bulk density for a sand soil type, as implemented in USEPA (2004).
Vadose Zone Temperature (°C)	11	Based on average shallow groundwater temperature in Ohio, as presented in USEPA (2004; Figure 8).
Thickness of Vadose Zone (h_v) (cm)	91	Conservatively applied minimum depth to top of soil vapor screens of 3 feet (0.91 m), as indicated in Table C.1 of Appendix C.
Depth to Soil Gas (L_{sg}) (cm)	91	Conservatively applied minimum depth to top of soil vapor screens of 3 feet (0.91 m), as indicated in Table C.1 of Appendix C.
Wind Speed, U_a (cm/s)	225	Default wind speed above ground surface in ambient mixing zone (ASTM, 2004).
Ambient Air Mixing Zone Height, δ_{air}(cm)	200	Default height of ambient air mixing zone (ASTM, 2004).
Width of Source Area, W (cm)	54864	Approximated based on the width of the Site (1,800 ft).

(6) Soil gas concentration is the RME/CT concentration taken from Table B.3.3.

(7) Ambient air concentrations obtained by multiplying the soil concentrations by the chemical-specific Volatilization Factors (VF_{sgamb}).

TABLE B.4.5

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR AMBIENT AIR - FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Medium: Soil Gas
Exposure Medium: Ambient Air
Exposure Point: Inhalation
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Inhalation	CIA	Chemical Concentration in Indoor Air	mg/m^3	(1)	(1)	(1)	(1)	CDI (mg/m^3) =
	FT	Fraction Time Exposed	unitless	8/24	Professional Judgment (2)	8/24	Professional Judgment (2)	CIA x FT x EF x ED x x 1/AT
	EF	Exposure Frequency	days/year	120	Professional Judgment (3)	60	Professional Judgment (3)	
	ED	Exposure Duration	years	1	Professional Judgment (4)	1	Professional Judgment (4)	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	365	USEPA, 1989	365	USEPA, 1989	

Notes:
mg/m^3 - milligram per cubic meter
CT - Central Tendency
CDI - Chronic Daily Intake
RME - Reasonable Maximum Exposure
(1) For modeled ambient air concentrations, refer to Table B.4.6.
(2) Professional Judgment; assumed 8 hour work day.
(3) Professional Judgment; assumes 5 days/wk for 6 months or 120 days (RME) and CT is half the RME or 60 days (CT).
(4) Professional Judgment; assumes construction campaign occurs within a one year time period.

References:

USEPA, 1989: Risk Assessment Guidance for Superfund (RAGS): Volume 1 - Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989.

TABLE B.4.6

CALCULATION OF SOIL GAS TO AMBIENT AIR CONCENTRATIONS WITHIN AN EXCAVATION FOR CONSTRUCTION/ UTILITY WORKER INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

	Chemical Properties (1)										
Chemicals of Potential Concern	*Henry's Law Constant, H_L (atm m³/mol) (1)*		*Water Diffusion Coefficient, D_{H2O} (cm²/s) (1)*		*Air Diffusion Coefficient, D_{air} (cm²/s) (1)*		*Henry's Law Constant, H' (unitless) (2)*	*Effective Diffusion Coefficient, D_s^{eff} (cm²/sec) (3)*	*Effective Diffusion Coefficient, D_s^{eff} (cm²/day) (3)*	*Soil Gas Concentration, C_{sg} (g/cm³) (4)*	*Vapor Flux, F (g/cm²-day) (5)*	*Soil Gas to Ambient Air Concentration, C_{aa} (µg/m³) (6)*
Benzene	2.82E-03	(11° C)	9.80E-06	(25° C)	8.19E-02	(11° C)	1.21E-01	1.32E-02	1.14E+03	7.40E-09	9.25E-08	7.25E-03
Ethylbenzene	3.38E-03	(11° C)	7.80E-06	(25° C)	6.98E-02	(11° C)	1.45E-01	1.13E-02	9.75E+02	2.53E-08	2.70E-07	2.11E-02
Naphthalene	1.65E-04	(11° C)	7.50E-06	(25° C)	5.49E-02	(11° C)	7.07E-03	8.87E-03	7.67E+02	3.73E-10	3.13E-09	2.45E-04
Trichloroethene	5.05E-03	(11° C)	9.10E-06	(25° C)	7.35E-02	(11° C)	2.17E-01	1.19E-02	1.03E+03	2.96E-08	3.32E-07	2.60E-02
Vinyl chloride	1.78E-02	(11° C)	1.23E-05	(25° C)	9.86E-02	(11° C)	7.63E-01	1.59E-02	1.38E+03	2.77E-09	4.17E-08	3.27E-03

Notes:

atm m³/mol - atmosphere cubic meter per mole

cm²/s - square centimeter per second

g/cm³ - gram per cubic centimeter

cm - centimeter

cm/s - centimeter per second

µg/m³ - microgram per cubic meter

cm²/day - square centimeter per day

(1) Chemical properties were obtained from the chemical properties database implemented in USEPA (2004). The Henry's Law constant and air diffusion coefficient were corrected for an average vadose zone temperature of 11°C. The reference temperature for the water diffusion coefficient is 25°C and, considering its low value, a correction to 11°C was considered negligible.

(2) The Henry's Law Constant $H' = H_L/(T \cdot R)$, where T is the vadose zone temperature in degrees Kelvin and the universal gas constant R is 8.21E-05 atm m³/mol K.

(3) The Effective Diffusion Coefficient, D_s^{eff} (cm²/s), in soil is calculated from $D_s^{eff} = (D_{air} \cdot \varepsilon_v^{3.33} / \varepsilon_T^2) + (D_{H2O} / H' \cdot \varepsilon_m^{3.33} / \varepsilon_T^2)$ (ASTM, 2002).
D_s^{eff} (cm²/s) x 60 x 60 x 24 = D_s^{eff} (cm²/day)

(4) The soil gas concentration, C_{sg} (g/cm³), represents the RME/CT concentration presented in Table 3.3 in units of µg/m³ converted to units of g/cm³ by dividing by 10^{12}.

(5) The vapor flux, F (g/cm²-day), is calculated from $F = D_s^{eff} \times C_{sg} / h_v$ (ASTM, 2002).

(6) The soil vapor to ambient air concentration, C_{aa} (µg/m³), is calculated from $C_{aa} = F \times W / U_a \times \delta_{air} \times CF$ (ASTM, 2002), where the g/cm³ to µg/m³ conversion factor, CF, is 10^{12}.

Vadose Zone Properties:		
Total Porosity, ε_T (%)	37.5	Default porosity for a sand soil type as implemented in USEPA (2004).
Vadose zone Moisture-Filled Porosity, ε_m	0.054	Default moisture-filled porosity for a sand soil type, as implemented in USEPA (2004).
Vadose Zone Vapor-Filled Porosity, ε_v	0.321	Vapor-filled porosity, $\varepsilon_v = \varepsilon_T / 100 - \varepsilon_m$
Dry Bulk Soil Density, ρ_b (g/cm³)	1.66	Default dry bulk density for a sand soil type, as implemented in USEPA (2004).
Vadose Zone Temperature (°C)	11	Based on average shallow groundwater temperature in Ohio, as presented in USEPA (2004; Figure 8).
Thickness of Vadose Zone (h_v) (cm)	91	Conservatively applied minimum depth to top of soil vapor screens of 3 feet (0.91 m), as indicated in Table C.1 of Appendix C.
Wind Speed, U_a (cm/day)	19440000	Assuming a wind speed of 225 cm/sec (ASTM, 2002).
Ambient Air Mixing Zone Height, δ_{air} (cm)	200	Based on the typical height of a person of 2 metres (ASTM, 2002).
Width of Source Area, W (cm)	305	Approximated based on the typical length of a trench (10 ft).

Sources:

ASTM, 2002. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, American Society for Testing and Materials, E1739-95 (Re-approved 2002).

TABLE B4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SURFACE SOIL - CURRENT/ FUTURE ON SITE TRESPASSER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Surface Soil
Exposure Medium: Surface Soil/ Ambient Air
Exposure Point: Ingestion, Dermal, and Inhalation
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Ingestion	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg soil/day	100	USEPA, 2002	100	USEPA, 2002	CS x IR x CF x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	–	1.00E-06	–	
	EF	Exposure Frequency	days/year	50.6	USEPA, 2008 (2)	25.3	USEPA, 2008 (2)	
	ED	Exposure Duration	years	10	USEPA, 2000 (3)	10	USEPA, 2000 (3)	
	BW	Body Weight	kg	45	USEPA, 2000	45	USEPA, 2000	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	3,650	USEPA, 1989	3,650	USEPA, 1989	
Dermal	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	CDI (mg/kg-day) =
	SA	Skin Surface Area Available for Contact	cm^2/event	3,900	USEPA, 2008 (4)	3,900	USEPA, 2008 (4)	CS x CF x SA x AF x ABS x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	–	1.00E-06	–	
	EF	Exposure Frequency	days/year	50.6	USEPA, 2008 (2)	25.3	USEPA, 2008 (2)	
	ED	Exposure Duration	years	10	USEPA, 2000 (3)	10	USEPA, 2000 (3)	
	BW	Body Weight	kg	45	USEPA, 2000	45	USEPA, 2000	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	3,650	USEPA, 1989	3,650	USEPA, 1989	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	USEPA, 2004	0.04	USEPA, 2004	
	ABS	Absorption Factor	%/100	chemical specific	USEPA, 2004; USEPA 1995 (5)	chemical specific	USEPA, 2004; USEPA 1995 (5)	

TABLE B.4.7

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SURFACE SOIL - CURRENT/ FUTURE ON SITE TRESPASSER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Surface Soil
Exposure Medium: Surface Soil/ Ambient Air
Exposure Point: Ingestion, Dermal, and Inhalation
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Inhalation	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	CDI (mg/m^3) =
	FT	Fraction Time Exposed	unitless	3.4/24	USEPA, 2008 (6)	1.7/24	USEPA, 2008 (6)	CS x FT x EF x ED x (1/PEF or VF) x 1/AT
	EF	Exposure Frequency	days/year	50.6	USEPA, 2008 (2)	25.3	USEPA, 2008 (2)	
	ED	Exposure Duration	years	10	USEPA, 2000 (3)	10	USEPA, 2000 (3)	
	BW	Body Weight	kg	45	USEPA, 2000	45	USEPA, 2000	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	3,650	USEPA, 1989	3,650	USEPA, 1989	
	PEF	Particulate Emission Factor	m^3/kg	1.36E+09	USEPA, 2002	1.36E+09	USEPA, 2002	
	VF	Volatilization Factor	m^3/kg	chemical-specific	Refer to Table B.4.8	chemical-specific	Refer to Table B.4.8	

Notes:

(1) For surface soil concentrations, refer to Table B.3.4.

(2) The basis for the EF is the 50th percentile from Table 16-1, Recommended Values for Activity Factors - Time Outdoors (total).

The time spent outdoors for 11-16 years old of 100 min/day from out of a possible 365 days equates to 25.3 days (CT) [(100 min/d /1440 total min/d)*365]. The RME is double the CT value for 50.6 days.

(3) Trespasser is a 7 through 16 year old therefore the exposure duration is 10 years, based on USEPA Region 4 (2000).

(4) The basis for SA is the 50th percentile value from Table 7-1, Recommended Values for Total Body Surface Area, Males and Females Combined . The total body surface area was multiplied by 0.25 (25 percent) to account for exposed skin.

(5) Published numbers include: Arsenic (3%), Cadmium (0.1%), Metals (1%), VOCs VP > benzene VP (3%), VOCs VP < benzene VP (0.05%), PAHs (13%), SVOCs (10%), PCBs (14%), Pesticides (10%).

(6) The basis for the FT is the 50th percentile from Table 16-1, Recommended Values for Activity Factors - Time Outdoors (total).

The time spent outdoors for 11-16 years old of 100 min/day equates to 1.7 hrs (CT) [100/60]. The RME is double the CT value for 3.4 hrs.

mg/kg - milligram per kilogram
m^3/kg - cubic meter per kilogram

References:

USEPA, 1989: Risk Assessment Guidance for Superfund (RAGS): Volume 1 – Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989.

USEPA, 1995: Assessing Dermal Exposure From Soil, Region III Technical Guidance Manual, EPA/903-K-95-003.

USEPA, 2000: Region 4 Human Health Risk Assessment Bulletins – Supplement to RAGS, Section 4: Exposure Assessment, May.

USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December 2002.

USEPA, 2004: Risk Assessment Guidance for Superfund (RAGS):Volume 1 - Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment), EPA/540/R/99/005, July 2004.

USEPA, 2008: Child Specific Exposure Factors Handbook, September 2008.

TABLE B.4.8

DERIVATION OF VOLATILIZATION FACTOR (VF) FOR SURFACE SOIL - CURRENT/ FUTURE ON SITE TRESPASSER INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

VF: Soil-to-Air Volatilization Factor

$$VF = Q/C \times \frac{(3.14 \times D_A \times T)^{1/2}}{(2 \times \rho_b \times D_A)} \times 10^{-4} (m^2/cm^2)$$

				Reference	Units	Chemical of Potential Concern: Benzo(b)fluoranthene
Where:	VF	=	soil-to-air volatilization factor	Equation 4-8, USEPA, 2002	m^3/kg	1.01E+06
	Q/C_{vol}	=	inverse of mean conc - centre of square source	Equation D-3, USEPA, 2002	$(g/m^2\text{-sec})/(kg/m^3)$	39.23
	D_A	=	apparent diffusivity	Equation 4-8, USEPA, 2002	cm^2/s	1.35E-09
	T	=	exposure interval	USEPA, 2002	s	3.15E+08
	r_b	=	soil dry bulk density	Refer to Appendix C	g/cm^3	1.66

Q/C_{vol}: Inverse of Mean Conc - Centre of Square Source

$$Q/C_{vol} = A \times \exp \frac{(\ln Area - B)^2}{C}$$

Where:	"A"	=	constant	Exhibit D-3, USEPA, 2002 (1)		12.8612
	Area	=	areal extent of the site or contamination	Site-Specific	acres	70
	"B"	=	constant	Exhibit D-3, USEPA, 2002 (1)		20.5164
	"C"	=	constant	Exhibit D-3, USEPA, 2002 (1)		237.2798

D_A: Apparent Diffusivity

$$D_A = \frac{\left[\left(\Theta_a^{10/3} D_l H' + \Theta_w^{10/3} D_w\right)/n^2\right]}{\rho_b K_b + \Theta_w + \Theta_a H'}$$

					Units	
Where:	D_A	=	apparent diffusivity	Equation 4-8, USEPA, 2002	cm^2/s	1.35E-09
	Q_a	=	air-filled porosity	Refer to Appendix C	unitless	0.321
	Q_w	=	water-filled porosity	Refer to Appendix C	unitless	0.054
	n	=	total soil porosity	Refer to Appendix C	unitless	0.375
	r_b	=	soil dry bulk density	Refer to Appendix C	g/cm^3	1.66
	H'	=	dimensionless Henry's Law Constant at ref. temp.	USEPA, 2004	unitless	4.54E-03
	D_l	=	diffusivity of chemical x in air at ref. temp.	USEPA, 2004	cm^2/s	2.26E-02
	D_w	=	diffusivity of chemical x in water at ref. temp.	USEPA, 2004	cm^2/s	5.56E-06
	K_d	=	soil-water partition coefficient	USEPA, 2002	cm^3/g	7.38E+03

Kd: Soil-Water Partition Coefficient

$$K_d = K_{oc} \times f_{oc}$$

					Units	
Where:	K_d	=	soil-water partition coefficient	USEPA, 2002	cm^3/g	7.38E+03
	K_{oc}	=	soil organic carbon-water partition coefficient	USEPA, 2004	cm^3/g	1.23E+06
	f_{oc}	=	organic content of soil	USEPA, 2002	g/g	0.006

Notes:
m^3/kg - cubic meter per kilogram
cm^2/s - square centimeter per second
g/cm^3 - gram per cubic centimeter
cm - centimeter
cm/s - centimeter per second
$\mu g/m^3$- microgram per cubic meter
kg/m^3 - kilogram per cubic meter
cm^3/g- cubic centimeter per gram
g/m^2-sec - gram per cubic meter second
(1) The A, B, and C based on Zone 7 - Cleveland, OH.

References:

USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December 2002.

TABLE B.4.9

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SURFACE SOIL - CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Surface Soil
Exposure Medium: Surface Soil/ Ambient Air
Exposure Point: Ingestion, Dermal, and Inhalation
Receptor Population: On Site Industrial/ Commercial Worker
Receptor Age: Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Ingestion	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg soil/day	100	USEPA, 2002	100	USEPA, 2002	CS x IR x CF x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	--	1.00E-06	--	
	EF	Exposure Frequency	days/year	250	USEPA, 2004	219	USEPA, 2004	
	ED	Exposure Duration	years	25	USEPA, 2004	9	USEPA, 2004	
	BW	Body Weight	kg	70	USEPA, 2002	70	USEPA, 2002	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	9,125	USEPA, 1989	3,285	USEPA, 1989	
Dermal	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	CDI (mg/kg-day) =
	SA	Skin Surface Area Available for Contact	cm^2/event	3,300	USEPA, 2004	3,300	USEPA, 2004	CS x CF x SA x AF x ABS x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	--	1.00E-06	--	
	EF	Exposure Frequency	days/year	250	USEPA, 2004	219	USEPA, 2004	
	ED	Exposure Duration	years	25	USEPA, 2004	9	USEPA, 2004	
	BW	Body Weight	kg	70	USEPA, 2002	70	USEPA, 2002	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	9,125	USEPA, 1989	3,285	USEPA, 1989	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	USEPA, 2004	0.02	USEPA, 2004	
	ABS	Absorption Factor	%/100	chemical specific	USEPA, 2004; USEPA 1995 (2)	chemical-specific	USEPA, 2004; USEPA 1995 (2)	

TABLE B.4.9

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SURFACE SOIL - CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Surface Soil
Exposure Medium: Surface Soil/ Ambient Air
Exposure Point: Ingestion, Dermal, and Inhalation
Receptor Population: On Site Industrial/ Commercial Worker
Receptor Age: Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Inhalation	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	CDI (mg/m^3) =
	FT	Fraction Time Exposed	unitless	8/24	Professional Judgment (3)	8/24	Professional Judgment (3)	CS x FT x EF x ED x (1/PEF or VF) x 1/AT
	EF	Exposure Frequency	days/year	250	USEPA, 2004	219	USEPA, 2004	
	ED	Exposure Duration	years	25	USEPA, 2004	9	USEPA, 2004	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	9,125	USEPA, 1989	3,285	USEPA, 1989	
	PEF	Particulate Emission Factor	m^3/kg	1.36E+09	USEPA, 2002	1.36E+09	USEPA, 2002	
	VF	Volatilization Factor	m^3/kg	chemical-specific	Refer to Table B.4.10	chemical-specific	Refer to Table B.4.10	

Notes:

CT - Central Tendency
RME - Reasonable Maximum Exposure
kg/mg - kilogram per milligram
mg/kg - milligram per kilogram
mg soil - milligram soil
kg - kilogram
mg/cm^2 - milligram per square centimeter
m^3/kg - cubic meter per kilogram
cm^2/event- square centimeter per event
(1) For surface soil concentrations, refer to Table B.3.4.
(2) Published numbers include: Arsenic (3%), Cadmium (0.1%), Metals (1%), VOCs Vapor Pressure (VP) > benzene VP (3%), VOCs VP < benzene VP (0.05%), PAHs (13%), SVOCs (10%), PCBs (14%), Pesticides (10%).
(3) Professional Judgment; assumed 8 hour work day.

References:

USEPA, 1989: Risk Assessment Guidance for Superfund (RAGS): Volume 1 – Human Health Evaluation Manual (Part A), Interim Final, EPA/540/1-89/002, December 1989.
USEPA, 1995: Assessing Dermal Exposure From Soil, Region III Technical Guidance Manual, EPA/903-K-95-003.
USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December 2002.

TABLE B.4.10

DERIVATION OF VOLATILIZATION FACTOR (VF) FOR SURFACE SOIL -
CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

VF: Soil-to-Air Volatilization Factor

$$VF = Q/C \times \frac{(3.14 \times D_A \times T)^{1/2}}{(2 \times \rho_b \times D_A)} \times 10^{-4} (m^2/cm^2)$$

				Reference	Units	Chemical of Potential Concern: Benzo(b)fluoranthene
Where:	VF	=	soil-to-air volatilization factor	Equation 4-8, USEPA, 2002	m^3/kg	1.60E+06
	Q/C_{vol}	=	inverse of mean conc - centre of square source	Equation D-3, USEPA, 2002	$(g/m^2\text{-sec})/(kg/m^3)$	39.23
	D_A	=	apparent diffusivity	Equation 4-8, USEPA, 2002	cm^2/s	1.35E-09
	T	=	exposure interval	USEPA, 2002	s	7.88E+08
	r_b	=	soil dry bulk density	Refer to Appendix C	g/cm^3	1.66

Q/C_{vol}: Inverse of Mean Conc - Centre of Square Source

$$Q/C_{vol} = A \times \exp \frac{(\ln Area - B)^2}{C}$$

Where:	"A"	=	constant	Exhibit D-3, USEPA, 2002 (1)		12.8612
	Area	=	areal extent of the site or contamination	Site-Specific	acres	70
	"B"	=	constant	Exhibit D-3, USEPA, 2002 (1)		20.5164
	"C"	=	constant	Exhibit D-3, USEPA, 2002 (1)		237.2798

D_A: Apparent Diffusivity

$$D_A = \frac{\left[\left(\Theta_a^{10/3} D_i H' + \Theta_w^{10/3} D_w\right)/n^2\right]}{\rho_b K_b + \Theta_w + \Theta_a H'}$$

					Units	
Where:	D_A	=	apparent diffusivity	Equation 4-8, USEPA, 2002	cm^2/s	1.35E-09
	Q_a	=	air-filled porosity	Refer to Appendix C	unitless	0.321
	Q_w	=	water-filled porosity	Refer to Appendix C	unitless	0.054
	n	=	total soil porosity	Refer to Appendix C	unitless	0.375
	r_b	=	soil dry bulk density	Refer to Appendix C	g/cm^3	1.66
	H'	=	dimensionless Henry's Law Constant at ref. temp.	USEPA, 2004	unitless	4.54E-03
	D_i	=	diffusivity of chemical x in air at ref. temp.	USEPA, 2004	cm^2/s	2.26E-02
	D_w	=	diffusivity of chemical x in water at ref. temp.	USEPA, 2004	cm^2/s	5.56E-06
	K_d	=	soil-water partition coefficient	USEPA, 2002	cm^3/g	7.38E+03

Kd: Soil-Water Partition Coefficient

$$K_d = K_{oc} \times f_{oc}$$

					Units	
Where:	K_d	=	soil-water partition coefficient	USEPA, 2002	cm^3/g	7.38E+03
	K_{oc}	=	soil organic carbon-water partition coefficient	USEPA, 2004	cm^3/g	1.23E+06
	f_{oc}	=	organic content of soil	USEPA, 2002	g/g	0.006

Notes:

m^3/kg - cubic meter per kilogram
cm^2/s - square centimeter per second
g/cm^3 - gram per cubic centimeter
cm - centimeter
cm/s - centimeter per second

TABLE B.4.11

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SURFACE AND SUBSURFACE SOIL - FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Medium: Surface and Subsurface Soil
Exposure Medium: Soil/ Ambient Air
Exposure Point: Ingestion, Dermal, and Inhalation
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Ingestion	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	(1)	(1)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg soil/day	330	USEPA, 2002	330	USEPA, 2002	CS x IR x CF x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	--	1.00E-06	--	
	EF	Exposure Frequency	days/year	120	Professional Judgment (2)	60	Professional Judgment (2)	
	ED	Exposure Duration	years	1	Professional Judgment (3)	1	Professional Judgment (3)	
	BW	Body Weight	kg	70	USEPA, 2002	70	USEPA, 2002	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	365	USEPA, 1989	365	USEPA, 1989	
Dermal	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	(1)	(1)	CDI (mg/kg-day) =
	SA	Skin Surface Area Available for Contact	cm^2/event	3,300	USEPA, 2004	3,300	USEPA, 2004	CS x CF x SA x AF x ABS x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	--	1.00E-06	--	
	EF	Exposure Frequency	days/year	120	Professional Judgment (2)	60	Professional Judgment (2)	
	ED	Exposure Duration	years	1	Professional Judgment (3)	1	Professional Judgment (3)	
	BW	Body Weight	kg	70	USEPA, 2002	70	USEPA, 2002	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	365	USEPA, 1989	365	USEPA, 1989	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.3	USEPA, 2004	0.1	USEPA, 2004	
	ABS	Absorption Factor	%/100	chemical specific	USEPA, 2004; USEPA 1995 (4)	chemical-specific	USEPA, 2004; USEPA 1995 (4)	

TABLE B.4.11

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SURFACE AND SUBSURFACE SOIL - FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Medium: Surface and Subsurface Soil
Exposure Medium: Soil/ Ambient Air
Exposure Point: Ingestion, Dermal, and Inhalation
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Inhalation	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	(1)	(1)	CDI (mg/m^3) =
	FT	Fraction Time Exposed	unitless	8/24	Professional Judgment (5)	8/24	Professional Judgment (5)	CS x FT x EF x ED x (1/PEF or VF) x 1/AT
	EF	Exposure Frequency	days/year	120	Professional Judgment (2)	60	Professional Judgment (2)	
	ED	Exposure Duration	years	1	Professional Judgment (3)	1	Professional Judgment (3)	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	365	USEPA, 1989	365	USEPA, 1989	
	PEF	Particulate Emission Factor	m^3/kg	site-specific	Refer to Table B.4.12	site-specific	Refer to Table B.4.12	

Notes:

CT - Central Tendency
RME - Reasonable Maximum Exposure
kg/mg - kilogram per miligram
mg/kg - miligram per kilogram
mg soil - miligram soil
kg - kilogram
m^3/kg - cubic meter per kilogram
mg/cm^2 - milligram per square centimeter
cm^2/event- square centimeter per event
(1) For soil concentrations, refer to Table B.3.5.
(2) Professional Judgment; assumes 5 days/wk for 6 months or 120 days (RME) and CT is half the RME or 60 days (CT).
(3) Professional Judgment; assumes construction campaign occurs within a one year time period.
(4) Published numbers include: Arsenic (3%), Cadmium (0.1%), Metals (1%), VOCs Vapor Pressure (VP) > benzene VP (3%), VOCs VP < benzene VP (0.05%), PAHs (13%), SVOCs (10%), PCBs (14%), Pesticides (10%).

TABLE B.4.12

DERIVATION OF PARTICULATE EMISSION FACTOR (PEF) FOR SOIL - FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER INHALATION EXPOSURE SOUTH DAYTON DUMP AND LANDFILL SITE MORAINE, OHIO

$$PEF_{SC} = Q/C_{ar} \times 1/F_D \times [(T \times A_R) / (556 \times ((W/3)^{0.4} \times ((365\ d/y - p) / 365\ d/y) \times VKT)]$$

$$Q/C_{ar} = A \times EXP [(\ln A_a - B)^2 / C]$$

INPUT PARAMETERS		*REFERENCE*
PEF_{sc}/ subchronic road particulate emission factor (m^3/kg) =	**9.23E+06**	Equation 5-5, USEPA, 2002
Q/C_{ar}/ inverse of ratio of the 1-h geometric mean air concentration =	13.34	Equation 5-6, USEPA, 2002
A/ constant (unitless) =	12.9351	USEPA, 2002
B/ constant (unitless) =	5.7383	USEPA, 2002
C/ constant (unitless) =	71.7711	USEPA, 2002
A_a/ areal extent of site surface soil contamination (acres) =	70	Site-Specific
F_D/ dispersion correction factor (unitless) =	0.185	USEPA, 2002
T/ total time over which construction occurs (s) =	3.15E+07	USEPA, 2002 (site-specific, within a 1 year construction campaign)
A_R/ surface area of contaminated road segment (m^2) =	274	USEPA, 2002 (A_R = LR*WR*0.092903 m^2/ft^2)
LR - length of road segment (ft) =	148	USEPA, 2002
WR - width of road segment (ft) =	20	USEPA, 2002
W/ mean vehicle weight (tons) =	8	USEPA, 2002, Assumes 20 two-ton cars and 10 twenty-ton trucks (W = (20*2+10*20)/30)
p/ number of days with at least 0.01 inches of precipitation (days/yr) =	180	USEPA, 2002
VKT/ sum of fleet vehicle kilometers travelled during the exposure duration (km) =	162	Assuming that the area is configured as a square with the unpaved construction access road segment dividing the square evenly, the road length would be equal to the square root of 2023.5 m^2, also equal to 45 m or 0.045 km. Assuming that each vehicle travels the length of the road once per day, 5 days per week for a total of 120 days, (30*0.045*120).

Notes

s - seconds
m^2 - square meters
ft - feet
days/yr - days per year
km - kilometer
m^2/ft^2 - square meters per square feet

VKT/ sum of fleet vehicle kilometres travelled during the exposure duration (km) =

TABLE B.4.13

DERIVATION OF VOLATILIZATION FACTOR (VF) FOR SOIL -
FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

$$VF = (Q/C) \times 1/F_D \times ((3.14 \times D_a \times T)^{1/2}) \times 10^{-4} / (2 \times db \times D_a)$$

$$Da = ((Pa^{10/3} \times Di \times H + Pw^{10/3} \times Dw) / n^2)/(db \times Kd + Pw + Pa \times H)$$

$$Q/C_{sa} = A \times EXP [(\ln A_s - B)^2 / C]$$

$$F_D = 0.1852+(5.3537/t_c)+(-9.6318/t_c^2)$$

Input Parameters	Reference	Chemicals of Potential Concern: Benzo(b)fluoranthene	Chemicals of Potential Concern: Mercury
VF/ volatilization factor (m^3/kg) =	Equation 5-14, USEPA, 2002	**2.75E+05**	**2.02E+03**
Da/ apparent diffusivity (cm^2/s) =	Equation 5-14, USEPA, 2002	1.35E-09	2.51E-05
Q/C/ inverse of the mean conc. at center of square source (g/m^2-s per kg/m^3) =	Equation 5-15, USEPA, 2002	6.27	6.27
A/ constant (unitless) =	USEPA, 2002	2.4538	2.4538
B/ constant (unitless) =	USEPA, 2002	17.566	17.566
C/ constant (unitless) =	USEPA, 2002	189.0426	189.0426
A_s/ areal extent of site surface soil contamination (acres) =	Site-Specific	70	70
F_D/ dispersion correction factor (unitless) =	Equation E-16, USEPA, 2002	0.186	0.186
Pa/ air-filled soil porosity (L_{air}/L_{soil}) =	Refer to Appendix C	0.321	0.321
Di/ diffusivity of chemical x in air at ref. temp. =	USEPA, 2004	2.26E-02	3.07E-02
H/ Henry's Law Constant dimensionless at ref. temp. =	USEPA, 2004	4.54E-03	4.40E-01
Pw/ water-filled soil porosity (L_{water}/L_{soil}) =	Refer to Appendix C	0.054	0.054
Dw/ diffusivity of chemical x in water at ref. temp. =	USEPA, 2004	5.56E-06	6.30E-06
n/ total soil porosity (L_{pore}/L_{soil}) =	Refer to Appendix C	0.375	0.375
db/ dry soil bulk density (g/cm^3) =	Refer to Appendix C	1.66	1.66
Kd/ soil-water partition coefficient (cm^3/g) =	USEPA, 2002 (Kd = Koc x foc)	7.38E+03	5.20E+01
Koc/ soil organic carbon-water partition coefficient (cm^3/g) =	USEPA, 2004	1.23E+06	–
foc/ organic carbon content of soil (g/g) =	USEPA, 2002	0.006	0.006
t_c/ exposure interval (hrs) =	Site-Specific	8.76E+03	8.76E+03
T/ exposure interval (s) =	Site-Specific	3.15E+07	3.15E+07
Conversion Factor/ 10^{-4} (m^2/cm^2) =	USEPA, 2002	1.00E-04	1.00E-04

Notes

m^3/kg- cubic meter per kilogram
g/m2-s - gram per square meter second
cm^2/s - square centimeter per second
kg/m^3 - kilogram per cubic meter
g/cm^3 - gram per cubic centimeter
cm^3/g - cubic centimeter per gram
g/g - gram per gram
hrs - hours
s - second
m^2/cm^2 - square meter per square centimeter

References:

USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December 2002.
USEPA, 2004: User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings (Revised), Office of Emergency and Remedial Response, February.

TABLE B.4.14

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SEDIMENT - CURRENT/ FUTURE ON SITE TRESPASSER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Ingestion and Dermal
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Ingestion	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg soil/day	100	USEPA, 2002	100	USEPA, 2002	CS x IR x CF x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	–	1.00E-06	–	
	EF	Exposure Frequency	days/year	50.6	USEPA, 2008 (2)	25.3	USEPA, 2008 (2)	
	ED	Exposure Duration	years	10	USEPA, 2000 (3)	10	USEPA, 2000 (3)	
	BW	Body Weight	kg	45	USEPA, 2000	45	USEPA, 2000	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	3,650	USEPA, 1989	3,650	USEPA, 1989	
Dermal	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	CDI (mg/kg-day) =
	SA	Skin Surface Area Available for Contact	cm^2/event	3,900	USEPA, 2008 (4)	3,900	USEPA, 2008 (4)	CS x CF x SA x AF x ABS x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	–	1.00E-06	–	
	EF	Exposure Frequency	days/year	50.6	USEPA, 2008 (2)	25.3	USEPA, 2008 (2)	
	ED	Exposure Duration	years	10	USEPA, 2000 (3)	10	USEPA, 2000 (3)	
	BW	Body Weight	kg	45	USEPA, 2000	45	USEPA, 2000	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	3,650	USEPA, 1989	3,650	USEPA, 1989	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	USEPA, 2004	0.04	USEPA, 2004	
	ABS	Absorption Factor	%/100	chemical specific	USEPA, 2004; USEPA 1995 (5)	chemical specific	USEPA, 2004; USEPA 1995 (5)	

Notes:
CT - Central Tendency
RME - Reasonable Maximum Exposure
mg/kg - milligram per kilogram
mg soil/day - milligram soil per day
kg/mg - kilogram per milligram
kg - kilogram
cm^2/event - square centimeter per event
mg/cm^2 - milligram per square centimeter
(1) For sediment concentrations, refer to Table B.3.7.
(2) The basis for the EF is the 50th percentile from Table 16-1, Recommended Values for Activity Factors - Time Outdoors (total).
The time spent outdoors for 6-11 years old of 100 min/day from out of a possible 365 days equates to 25.3 days (CT) [(100 min/d /1440 total min/d)*365]. The RME is double the CT value for 50.6 days.
(3) Trespasser is a 7 through 16 year old therefore the exposure duration is 10 years, based on USEPA Region 4 (2000).
(4) The basis for SA is the 50th percentile value from Table 7-1, Recommended Values for Total Body Surface Area, Males and Females Combined . The total body surface area was multiplied by 0.25 (25 percent) to account for exposed skin.

TABLE B.4.15

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SEDIMENT - CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Ingestion and Dermal
Receptor Population: On Site Industrial/ Commercial Worker
Receptor Age: Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Ingestion	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg soil/day	100	USEPA, 2002	100	USEPA, 2002	CS x IR x CF x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	--	1.00E-06	--	
	EF	Exposure Frequency	days/year	250	USEPA, 2004	219	USEPA, 2004	
	ED	Exposure Duration	years	25	USEPA, 2004	9	USEPA, 2004	
	BW	Body Weight	kg	70	USEPA, 2002	70	USEPA, 2002	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	9,125	USEPA, 1989	3,285	USEPA, 1989	
Dermal	CS	Chemical Concentration in Surface Soil	mg/kg	(1)	(1)	(1)	(1)	CDI (mg/kg-day) =
	SA	Skin Surface Area Available for Contact	cm^2/event	3,300	USEPA, 2004	3,300	USEPA, 2004	CS x CF x SA x AF x ABS x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	--	1.00E-06	--	
	EF	Exposure Frequency	days/year	250	USEPA, 2004	219	USEPA, 2004	
	ED	Exposure Duration	years	25	USEPA, 2004	9	USEPA, 2004	
	BW	Body Weight	kg	70	USEPA, 2002	70	USEPA, 2002	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	9,125	USEPA, 1989	3,285	USEPA, 1989	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.2	USEPA, 2004	0.02	USEPA, 2004	
	ABS	Absorption Factor	%/100	chemical specific	USEPA, 2004; USEPA 1995 (2)	chemical-specific	USEPA, 2004; USEPA 1995 (2)	

Notes:
CT - Central Tendency
RME - Reasonable Maximum Exposure
mg/kg - milligram per kilogram
mg soil/day - milligram soil per day
kg/mg - kilogram per milligram
kg - kilogram
cm^2/event - square centimeter per event
mg/cm^2 - milligram per square centimeter

TABLE B.4.16

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR SEDIMENT - FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Ingestion and Dermal
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Ingestion	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	(1)	(1)	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR	Ingestion Rate of Soil	mg soil/day	330	USEPA, 2002	330	USEPA, 2002	CS x IR x CF x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	--	1.00E-06	--	
	EF	Exposure Frequency	days/year	120	Professional Judgment (2)	60	Professional Judgment (2)	
	ED	Exposure Duration	years	1	Professional Judgment (3)	1	Professional Judgment (3)	
	BW	Body Weight	kg	70	USEPA, 2002	70	USEPA, 2002	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	365	USEPA, 1989	365	USEPA, 1989	
Dermal	CS	Chemical Concentration in Soil	mg/kg	(1)	(1)	(1)	(1)	CDI (mg/kg-day) =
	SA	Skin Surface Area Available for Contact	cm^2/event	3,300	USEPA, 2004	3,300	USEPA, 2004	CS x CF x SA x AF x ABS x EF x ED x 1/BW x 1/AT
	CF	Conversion Factor	kg/mg	1.00E-06	--	1.00E-06	--	
	EF	Exposure Frequency	days/year	120	Professional Judgment (2)	60	Professional Judgment (2)	
	ED	Exposure Duration	years	1	Professional Judgment (3)	1	Professional Judgment (3)	
	BW	Body Weight	kg	70	USEPA, 2002	70	USEPA, 2002	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N	Averaging Time (non-cancer)	days	365	USEPA, 1989	365	USEPA, 1989	
	AF	Soil to Skin Adherence Factor	mg/cm^2	0.3	USEPA, 2004	0.1	USEPA, 2004	
	ABS	Absorption Factor	%/100	chemical specific	USEPA, 2004; USEPA 1995 (4)	chemical-specific	USEPA, 2004; USEPA 1995 (4)	

Notes:
CT - Central Tendency
RME - Reasonable Maximum Exposure
mg/kg - milligram per kilogram
mg soil/day - milligram soil per day
kg/mg - kilogram per milligram
kg - kilogram
cm^2/event - square centimeter per event
mg/cm^2 - milligram per square centimeter
(1) For sediment concentrations, refer to Table B.3.7.
(2) Professional Judgment; assumes 5 days/wk for 6 months or 120 days (RME) and CT is half the RME or 60 days (CT).

TABLE B.4.17

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR INDOOR AIR - CURRENT/ FUTURE OFF SITE RESIDENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Groundwater
Exposure Medium: Indoor Air
Exposure Point: Inhalation
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Inhalation	CIA	Chemical Concentration in Indoor Air	mg/m^3	(1)	(1)	(1)	(1)	CDI (mg/m^3) =
	FT	Fraction Time Exposed	unitless	24/24	USEPA, 2008 (2)	18.5/24	USEPA, 2008 (2)	CIA x FT x EF x ED x x 1/AT
	EF	Exposure Frequency	days/year	350	USEPA, 2004	350	USEPA, 2004	
	ED - child	Exposure Duration	years	6	USEPA, 2004	6	USEPA, 2004	
	ED - adult	Exposure Duration	years	24	USEPA, 2004	3	USEPA, 2004	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N (child)	Averaging Time (non-cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
	AT-N (adult)	Averaging Time (non-cancer)	days	8,760	USEPA, 1989	1,095	USEPA, 1989	

Notes:

CT - Central Tendency

RME - Reasonable Maximum Exposure

mg/m^3 - milligram per cubic meter

(1) For modeled indoor air concentrations, refer to Appendix C.

(2) The basis for the FT is the 50th and 95th percentile from Table 16-1, Recommended Values for Activity Factors - Time Indoors (at residence).

The time spent indoors for <1 year old of 1108 min/day equates to 18.5 hrs (CT) [1108/60] and 24 hrs (RME) [1440/60].

It is assumed that the adult will spend the same amount of time indoors with their child.

TABLE B.4.18

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR GROUNDWATER - HOUSEHOLD USE - CURRENT/ FUTURE OFF SITE RESIDENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Groundwater
Exposure Medium: Household Use
Exposure Point: Ingestion, Dermal, and Inhalation
Receptor Population: Off-Site Residents
Receptor Age: Child & Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Ingestion	CW	Chemical Concentration in Groundwater	mg/L	(1)	--	(1)	--	Chronic Daily Intake (CDI) (mg/kg-day) =
	IR - child	Ingestion Rate of Water	L/day	1	USEPA, 1991a	1	USEPA, 1991a	CW x IR x EF x ED x 1/BW x 1/AT
	IR - adult	Ingestion Rate of Water	L/day	2	USEPA, 1991a	2	USEPA, 1991a	
	EF	Exposure Frequency	days/year	350	USEPA, 2004	350	USEPA, 2004	
	ED - child	Exposure Duration	years	6	USEPA, 2004	6	USEPA, 2004	
	ED - adult	Exposure Duration	years	24	USEPA, 2004	3	USEPA, 2004	
	BW - child	Body Weight	kg	15	USEPA, 2002a	15	USEPA, 2002a	
	BW - adult	Body Weight	kg	70	USEPA, 2002b	70	USEPA, 2002b	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N (child)	Averaging Time (non-cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
	AT-N (adult)	Averaging Time (non-cancer)	days	8,760	USEPA, 1989	1,095	USEPA, 1989	
Dermal	CW	Chemical Concentration in Groundwater	mg/L	(1)	--	(1)	--	CDI (mg/kg-day) =
	SA - child	Skin Surface Area Available for Contact	cm^2/event	6,600	USEPA, 2004	6,600	USEPA, 2004	DAevent x SA x EF x ED x 1/BW x 1/AT
	SA - adult	Skin Surface Area Available for Contact	cm^2/event	18,000	USEPA, 2004	18,000	USEPA, 2004	
	CF	Conversion Factor	L/cm^3	0.001	--	0.001	--	DAevent (mg/cm^2-event) - Inorganics=
	ET - child	Exposure Time	hr/day	1	USEPA, 2004	0.33	USEPA, 2004	PC x Cw x CF x ET
	ET - adult	Exposure Time	hr/day	0.58	USEPA, 2004	0.25	USEPA, 2004	
	EF	Exposure Frequency	days/year	350	USEPA, 2004	350	USEPA, 2004	DAevent (mg/cm^2-event) - Organics=
	ED - child	Exposure Duration	years	6	USEPA, 2004	6	USEPA, 2004	tevent <= t^* =
	ED - adult	Exposure Duration	years	24	USEPA, 2004	3	USEPA, 2004	2 x FA x PC x Cw x CF x SQRT(6 x Tevent x ET / PI)
	BW - child	Body Weight	kg	15	USEPA, 2002a	15	USEPA, 2002a	tevent > t^* =
	BW - adult	Body Weight	kg	70	USEPA, 2002b	70	USEPA, 2002b	FA x PC x Cw x CF x (ET/(1+B)+2 x Tevent x ((1+3 x B+3+B^2)/(1+B)^2)
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N (child)	Averaging Time (non-cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
	AT-N (adult)	Averaging Time (non-cancer)	days	8,760	USEPA, 1989	1,095	USEPA, 1989	
	PC	Permeability Constant	cm/hr	chemical-specific	USEPA, 2004	chemical-specific	USEPA, 2004	
	FA	Fraction Absorbed	dimensionless	chemical-specific	USEPA, 2004	chemical-specific	USEPA, 2004	
	Tevent	Lag Time	hr/event	chemical-specific	USEPA, 2004	chemical-specific	USEPA, 2004	
	B	Constant	dimensionless	chemical-specific	USEPA, 2004	chemical-specific	USEPA, 2004	

TABLE B.4.18

VALUES USED FOR DAILY INTAKE CALCULATIONS FOR GROUNDWATER - HOUSEHOLD USE - CURRENT/ FUTURE OFF SITE RESIDENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Medium: Groundwater
Exposure Medium: Household Use
Exposure Point: Ingestion, Dermal, and Inhalation
Receptor Population: Off-Site Residents
Receptor Age: Child & Adult

Exposure Route	*Parameter Code*	*Parameter Definition*	*Units*	*RME Value*	*RME Rationale/ Reference*	*CT Value*	*CT Rationale/ Reference*	*Intake Equation/ Model Name*
Inhalation	CW	Chemical Concentration in Groundwater	mg/L	(1)	--	(1)	--	CDI (mg/m^3) =
	FT - child	Fraction Time Exposed	unitless	1/24	USEPA, 2004	0.33/24	USEPA, 2004	CW x FT x EF x ED x VF x 1/AT
	FT - adult	Fraction Time Exposed	unitless	0.58/24	USEPA, 2004	0.25/24	USEPA, 2004	
	EF	Exposure Frequency	days/year	350	USEPA, 2004	350	USEPA, 2004	
	ED - child	Exposure Duration	years	6	USEPA, 2004	6	USEPA, 2004	
	ED - adult	Exposure Duration	years	24	USEPA, 2004	3	USEPA, 2004	
	BW - child	Body Weight	kg	15	USEPA, 2002a	15	USEPA, 2002a	
	BW - adult	Body Weight	kg	70	USEPA, 2002b	70	USEPA, 2002b	
	AT-C	Averaging Time (cancer)	days	25,550	USEPA, 1989	25,550	USEPA, 1989	
	AT-N (child)	Averaging Time (non-cancer)	days	2,190	USEPA, 1989	2,190	USEPA, 1989	
	AT-N (adult)	Averaging Time (non-cancer)	days	8,760	USEPA, 1989	1,095	USEPA, 1989	
	VF	Volatilization Factor	L/m^3	0.0005 x 1000	USEPA, 1991b	0.0005 x 1000	USEPA, 1991b	

Notes:

(1) For groundwater concentrations, refer to Table B.3.6.
CT - Central Tendency
RME - Reasonable Maximum Exposure
mg/kg - milligram per kilogram
mg soil/day - milligram soil per day
kg/mg - kilogram per milligram
kg - kilogram
cm^2/event - square centimeter per event

TABLE B.5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Chronic/ Subchronic*	*Oral RfD Value*	*Oral RfD Units*	*Oral to Dermal Adjustment Factor (1)*	*Adjusted Dermal RfD (2)*	*Units*	*Primary Target Organ*	*Combined Uncertainty/Modifying Factors*	*Sources of RfD: Target Organ*	*Dates of RfD: Target Organ (3) (MM-YY)*
VOCs										
1,1-Dichloroethane	chronic	2.00E-01	mg/kg-d	100%	2.00E-01	mg/kg-d	--	--	RSL	Dec-09
1,1-Dichloroethene	chronic	5.00E-02	mg/kg-d	100%	5.00E-02	mg/kg-d	liver	100	IRIS	Aug-02
1,2-Dichloroethane	chronic	2.00E-02	mg/kg-d	100%	2.00E-02	mg/kg-d	--	--	RSL	Dec-09
1,4-Dichlorobenzene	chronic	7.00E-02	mg/kg-d	100%	7.00E-02	mg/kg-d	--	--	RSL	Dec-09
Benzene	chronic	4.00E-03	mg/kg-d	100%	4.00E-03	mg/kg-d	blood system	300	IRIS	Apr-03
Bromomethane	chronic	1.40E-03	mg/kg-d	100%	1.40E-03	mg/kg-d	gastrointestinal system	1000	IRIS	Jul-91
Chlorobenzene	chronic	2.00E-02	mg/kg-d	100%	2.00E-02	mg/kg-d	liver	1000	IRIS	Jul-93
Chloroethane	--	--	--	--	--	--	--	--	--	--
Chloroform	chronic	1.00E-02	mg/kg-d	100%	1.00E-02	mg/kg-d	liver	100	IRIS	Oct-01
cis-1,2-Dichloroethene	chronic	1.00E-02	mg/kg-d	100%	1.00E-02	mg/kg-d	--	--	RSL	Dec-09
Cyclohexane	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	chronic	2.00E-02	mg/kg-d	100%	2.00E-02	mg/kg-d	liver	1000	IRIS	Mar-91
Dichlorodifluoromethane (CFC 12)	chronic	2.00E-01	mg/kg-d	100%	2.00E-01	mg/kg-d	body weight	100	IRIS	Nov-95
Ethylbenzene	chronic	1.00E-01	mg/kg-d	100%	1.00E-01	mg/kg-d	liver	1000	IRIS	Jun-91
Isopropylbenzene	chronic	1.00E-01	mg/kg-d	100%	1.00E-01	mg/kg-d	kidney	1000	IRIS	Aug-97
Methyl Tert Butyl Ether	--	--	--	--	--	--	--	--	--	--
Methylene chloride	chronic	6.00E-02	mg/kg-d	100%	6.00E-02	mg/kg-d	liver	100	IRIS	Mar-88
Tetrachloroethene	chronic	1.00E-02	mg/kg-d	100%	1.00E-02	mg/kg-d	liver	1000	IRIS	Mar-88
Toluene	chronic	8.00E-02	mg/kg-d	100%	8.00E-02	mg/kg-d	kidney	3000	IRIS	Sep-05
trans-1,2-Dichloroethene	chronic	2.00E-02	mg/kg-d	100%	2.00E-02	mg/kg-d	blood system	1000	IRIS	Jan-89
Trichloroethene	--	--	--	--	--	--	--	--	--	--
Trichlorofluoromethane	chronic	3.00E-01	mg/kg-d	100%	3.00E-01	mg/kg-d	mortality	1000	IRIS	Aug-92
Vinyl Chloride	chronic	3.00E-03	mg/kg-d	100%	3.00E-03	mg/kg-d	liver	30	IRIS	Aug-00
Xylenes (total)	chronic	2.00E-01	mg/kg-d	100%	2.00E-01	mg/kg-d	body weight	1000	IRIS	Feb-03

TABLE B.5.1

NON-CANCER TOXICITY DATA – ORAL/DERMAL ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Chronic/ Subchronic*	*Oral RfD Value*	*Oral RfD Units*	*Oral to Dermal Adjustment Factor (1)*	*Adjusted Dermal RfD (2)*	*Units*	*Primary Target Organ*	*Combined Uncertainty/Modifying Factors*	*Sources of RfD: Target Organ*	*Dates of RfD: Target Organ (3) (MM-YY)*
SVOCs										
2-Methylnaphthalene	chronic	4.00E-03	mg/kg-d	100%	4.00E-03	mg/kg-d	respiratory system	1000	IRIS	Dec-03
Benzo(a)anthracene	–	–	–	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	chronic	2.00E-02	mg/kg-d	100%	2.00E-02	mg/kg-d	liver	1000	IRIS	May-91
Dibenz(a,h)anthracene	–	–	–	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–	–	–	–	–
Naphthalene	chronic	2.00E-02	mg/kg-d	100%	2.00E-02	mg/kg-d	body weight	3000	IRIS	Sep-98
Metals										
Aluminum	chronic	1.00E+00	mg/kg-d	100%	1.00E+00	mg/kg-d	–	–	RSL	Dec-09
Antimony	chronic	4.00E-04	mg/kg-d	15%	6.00E-05	mg/kg-d	mortality	1000	IRIS	Feb-91
Arsenic	chronic	3.00E-04	mg/kg-d	100%	3.00E-04	mg/kg-d	skin discoloration	3	IRIS	Feb-93
Barium	chronic	2.00E-01	mg/kg-d	7%	1.40E-02	mg/kg-d	kidney	300	IRIS	Jul-05
Cadmium	chronic	5.00E-04	mg/kg-d	5%	2.50E-05	mg/kg-d	proteinuria	10	IRIS	Feb-94
Cobalt	chronic	3.00E-04	mg/kg-d	100%	3.00E-04	mg/kg-d	–	–	RSL	Dec-09
Copper	chronic	4.00E-02	mg/kg-d	100%	4.00E-02	mg/kg-d	gastrointestinal system	–	HEAST	Jul-97
Iron	chronic	7.00E-01	mg/kg-d	100%	7.00E-01	mg/kg-d	–	–	RSL	Dec-09
Lead	–	–	–	–	–	–	–	–	–	–
Manganese	chronic	2.40E-02	mg/kg-d	4%	9.60E-04	mg/kg-d	central nervous system	3	IRIS	May-96
Mercury	chronic	1.60E-04	mg/kg-d	100%	1.60E-04	mg/kg-d	–	–	RSL	Dec-09
Nickel	chronic	2.00E-02	mg/kg-d	100%	2.00E-02	mg/kg-d	body weight	300	IRIS	Dec-96
Selenium	chronic	5.00E-03	mg/kg-d	100%	5.00E-03	mg/kg-d	clinical selenosis	3	IRIS	Sep-91
Vanadium	chronic	7.00E-03	mg/kg-d	2.6%	1.82E-04	mg/kg-d	mortality	100	HEAST	Jul-97
Zinc	chronic	3.00E-01	mg/kg-d	100%	3.00E-01	mg/kg-d	blood system	3	IRIS	Aug-05

TABLE B.5.1

NON-CANCER TOXICITY DATA -- ORAL/DERMAL ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Chronic/ Subchronic*	*Oral RfD Value*	*Oral RfD Units*	*Oral to Dermal Adjustment Factor (1)*	*Adjusted Dermal RfD (2)*	*Units*	*Primary Target Organ*	*Combined Uncertainty/Modifying Factors*	*Sources of RfD: Target Organ*	*Dates of RfD: Target Organ (3) (MM-YY)*
PCBs										
Aroclor-1248 (PCB-1248)	--	--	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	chronic	2.00E-05	mg/kg-d	100%	2.00E-05	mg/kg-d	immune system	300	IRIS	Nov-96
Aroclor-1260 (PCB-1260)	--	--	--	--	--	--	--	--	--	--
Pesticides										
Dieldrin	chronic	5.00E-05	mg/kg-d	100%	5.00E-05	mg/kg-d	liver	100	IRIS	Sep-90
Heptachlor	chronic	5.00E-04	mg/kg-d	100%	5.00E-04	mg/kg-d	liver	300	IRIS	Mar-91
Dioxins/Furans										
Total TEQ	chronic	1.00E-09	mg/kg-d	100%	1.00E-09	mg/kg-d	--	--	RSL	Dec-09

Notes:

-- = Not Available

mg/kg-d - milligram per kilogram day

SVOCs - Semi Volatile Organic Compounds

VOCs - Volatile Organic Compounds

RfD - Reference Dose

PCBs - Polychlorinated biphenyls

(1) USEPA, Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, Part E Supplemental Guidance for Dermal Risk Assessment, EPA/540/R/99/005, July 2004.

(2) Adjusted Dermal RfD = Oral RfD x Oral to Dermal Adjustment Factor

TABLE B.5.2

NON-CANCER TOXICITY DATA – INHALATION ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Chronic/ Subchronic*	*Value Inhalation RfC*	*Units*	*Primary Target Organ*	*Combined Uncertainty/Modifying Factors*	*Sources of RfC: Target Organ*	*Dates of RfC: Target Organ (1) (MM-YY)*
VOCs							
1,1-Dichloroethane	–	–	–	–	–	–	–
1,1-Dichloroethene	chronic	2.00E-01	mg/m^3	liver	30	IRIS	Aug-02
1,2-Dichloroethane	chronic	2.40E+00	mg/m^3	–	–	RSL	Dec-09
1,4-Dichlorobenzene	chronic	8.00E-01	mg/m^3	liver	100	IRIS	Nov-96
Benzene	chronic	3.00E-02	mg/m^3	blood system	300	IRIS	Apr-03
Bromomethane	chronic	5.00E-03	mg/m^3	gastrointestinal system	100	IRIS	Oct-92
Chlorobenzene	chronic	5.00E-02	mg/m^3	–	–	RSL	Dec-09
Chloroethane	chronic	1.00E+01	mg/m^3	developmental effects	300	IRIS	Apr-91
Chloroform	chronic	9.80E-02	mg/m^3	–	–	RSL	Dec-09
cis-1,2-Dichloroethene	–	–	–	–	–	–	–
Cyclohexane	chronic	6.00E+00	mg/m^3	developmental effects	300	IRIS	Sep-03
Dibromochloromethane	–	–	–	–	–	–	–
Dichlorodifluoromethane (CFC 12)	chronic	2.00E-01	mg/m^3	body weight	10000	HEAST	Jul-97
Ethylbenzene	chronic	1.00E+00	mg/m^3	liver	300	IRIS	Mar-91
Isopropylbenzene	chronic	4.00E-01	mg/m^3	kidney	1000	IRIS	Aug-97
Methyl Tert Butyl Ether	chronic	3.00E+00	mg/m^3	organ weights	100	IRIS	Sep-93
Methylene chloride	chronic	1.00E+00	mg/m^3	–	–	RSL	Dec-09
Tetrachloroethene	chronic	2.70E-01	mg/m^3	–	–	RSL	Dec-09
Toluene	chronic	5.00E+00	mg/m^3	kidney	10	IRIS	Sep-05
trans-1,2-Dichloroethene	chronic	6.00E-02	mg/m^3	–	–	RSL	Dec-09
Trichloroethene	–	–	–	–	–	–	–
Trichlorofluoromethane	chronic	7.00E-01	mg/m^3	mortality	10000	HEAST	Jul-97
Vinyl Chloride	chronic	1.00E-01	mg/m^3	liver	30	IRIS	Aug-00
Xylenes (total)	chronic	1.00E-01	mg/m^3	body weight	300	IRIS	Feb-03

TABLE B.5.2

NON-CANCER TOXICITY DATA – INHALATION ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Chronic/ Subchronic*	*Value Inhalation RfC*	*Units*	*Primary Target Organ*	*Combined Uncertainty/Modifying Factors*	*Sources of RfC: Target Organ*	*Dates of RfC: Target Organ (1) (MM-YY)*
SVOCs							
2-Methylnaphthalene	–	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–	–
Dibenz(a,h)anthracene	–	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–	–
Naphthalene	chronic	3.00E-03	mg/m^3	body weight	3000	IRIS	Sep-98
Metals							
Aluminum	chronic	5.00E-03	mg/m^3	–	–	RSL	Dec-09
Antimony	–	–	–	–	–	–	–
Arsenic	chronic	1.50E-05	mg/m^3	–	–	RSL	Dec-09
Barium	chronic	5.00E-04	mg/m^3	kidney	1000	HEAST	Jul-97
Cadmium	chronic	1.00E-05	mg/m^3	–	–	RSL	Dec-09
Cobalt	chronic	6.00E-06	mg/m^3	–	–	RSL	Dec-09
Copper	–	–	–	–	–	–	–
Iron	–	–	–	–	–	–	–
Lead	–	–	–	–	–	–	–
Manganese	chronic	5.00E-05	mg/m^3	central nervous system	1000	IRIS	Dec-93
Mercury	chronic	3.00E-04	mg/m^3	central nervous system	30	IRIS	Jun-95
Nickel	chronic	9.00E-05	mg/m^3	–	–	RSL	Dec-09
Selenium	chronic	2.00E-02	mg/m^3	–	–	RSL	Dec-09
Vanadium	–	–	–	–	–	–	–
Zinc	–	–	–	–	–	–	–

TABLE B.5.2

NON-CANCER TOXICITY DATA – INHALATION ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Chronic/ Subchronic*	*Value Inhalation RfC*	*Units*	*Primary Target Organ*	*Combined Uncertainty/Modifying Factors*	*Sources of RfC: Target Organ*	*Dates of RfC: Target Organ (1) (MM-YY)*
PCBs							
Aroclor-1248 (PCB-1248)	–	–	–	–	–	–	–
Aroclor-1254 (PCB-1254)	–	–	–	–	–	–	–
Aroclor-1260 (PCB-1260)	–	–	–	–	–	–	–
Pesticides							
Dieldrin	–	–	–	–	–	–	–
Heptachlor	–	–	–	–	–	–	–
Dioxins/Furans							
Total TEQ	chronic	4.00E-08	mg/m^3	–	–	RSL	Dec-09

Notes:
– = Not Available
mg/m^3 - milligram per cubic meter
SVOCs - Semi Volatile Organic Compounds
VOCs - Volatile Organic Compounds
RfC - Reference Concentration

TABLE B.6.1

CANCER TOXICITY DATA – ORAL/DERMAL ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Oral Cancer Slope Factor*	*Oral to Dermal Adjustment Factor (1)*	*Adjusted Dermal Cancer Slope Factor (2)*	*Units*	*Weight of Evidence/ Cancer Guideline Description*	*Sources of CSF*	*Dates of CSF (3) (MM-YY)*
VOCs							
1,1-Dichloroethane	5.70E-03	100%	5.70E-03	$(mg/kg\text{-}day)^{-1}$	C	RSL	Dec-09
1,1-Dichloroethene	–	–	–	–	C	–	–
1,2-Dichloroethane	9.10E-02	100%	9.10E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Jan-91
1,4-Dichlorobenzene	5.40E-03	100%	5.40E-03	$(mg/kg\text{-}day)^{-1}$	–	RSL	Dec-09
Benzene	5.50E-02	100%	5.50E-02	$(mg/kg\text{-}day)^{-1}$	A	IRIS	Jan-00
Bromomethane	–	–	–	–	D	–	–
Chlorobenzene	–	–	–	–	D	–	–
Chloroethane	–	–	–	–	–	–	–
Chloroform	3.10E-02	100%	3.10E-02	$(mg/kg\text{-}day)^{-1}$	B2	RSL	Dec-09
cis-1,2-Dichloroethene	–	–	–	–	D	–	–
Cyclohexane	–	–	–	–	–	–	–
Dibromochloromethane	8.40E-02	100%	8.40E-02	$(mg/kg\text{-}day)^{-1}$	C	IRIS	Jan-92
Dichlorodifluoromethane (CFC 12)	–	–	–	–	–	–	–
Ethylbenzene	1.10E-02	100%	1.10E-02	$(mg/kg\text{-}day)^{-1}$	–	RSL	Dec-09
Isopropylbenzene	–	–	–	–	D	–	–
Methyl Tert Butyl Ether	1.80E-03	100%	1.80E-03	$(mg/kg\text{-}day)^{-1}$	–	RSL	Dec-09
Methylene chloride	7.50E-03	100%	7.50E-03	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Feb-95
Tetrachloroethene	5.40E-01	100%	5.40E-01	$(mg/kg\text{-}day)^{-1}$	–	RSL	Dec-09
Toluene	–	–	–	–	–	–	–
trans-1,2-Dichloroethene	–	–	–	–	–	–	–
Trichloroethene	5.90E-03	100%	5.90E-03	$(mg/kg\text{-}day)^{-1}$	–	RSL	Dec-09
Trichlorofluoromethane	–	–	–	–	–	–	–
Vinyl Chloride	7.20E-01	100%	7.20E-01	$(mg/kg\text{-}day)^{-1}$	A	IRIS	Aug-00
Xylenes (total)	–	–	–	–	–	–	–

TABLE B.6.1

CANCER TOXICITY DATA -- ORAL/DERMAL ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Oral Cancer Slope Factor*	*Oral to Dermal Adjustment Factor (1)*	*Adjusted Dermal Cancer Slope Factor (2)*	*Units*	*Weight of Evidence/ Cancer Guideline Description*	*Sources of CSF*	*Dates of CSF (3) (MM-YY)*
SVOCs							
2-Methylnaphthalene	--	--	--	--	--	--	--
Benzo(a)anthracene	7.30E-01	100%	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	RSL	Dec-09
Benzo(a)pyrene	7.30E+00	100%	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Nov-94
Benzo(b)fluoranthene	7.30E-01	100%	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	RSL	Dec-09
Benzo(k)fluoranthene	7.30E-02	100%	7.30E-02	$(mg/kg\text{-}day)^{-1}$	B2	RSL	Dec-09
bis(2-Ethylhexyl)phthalate	1.40E-02	100%	1.40E-02	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Feb-93
Dibenz(a,h)anthracene	7.30E+00	100%	7.30E+00	$(mg/kg\text{-}day)^{-1}$	B2	RSL	Dec-09
Indeno(1,2,3-cd)pyrene	7.30E-01	100%	7.30E-01	$(mg/kg\text{-}day)^{-1}$	B2	RSL	Dec-09
Naphthalene	--	--	--	--	C	--	--
Metals							
Aluminum	--	--	--	--	--	--	--
Antimony	--	--	--	--	--	--	--
Arsenic	1.50E+00	100%	1.50E+00	$(mg/kg\text{-}day)^{-1}$	A	IRIS	Apr-98
Barium	--	--	--	--	D	--	--
Cadmium	--	--	--	--	B1	--	--
Cobalt	--	--	--	--	--	--	--
Copper	--	--	--	--	D	--	--
Iron	--	--	--	--	--	--	--
Lead	--	--	--	--	B2	--	--
Manganese	--	--	--	--	D	--	--
Mercury	--	--	--	--	D	--	--
Nickel	--	--	--	--	--	--	--
Selenium	--	--	--	--	D	--	--
Vanadium	--	--	--	--	--	--	--
Zinc	--	--	--	--	D	--	--

TABLE B.6.1

CANCER TOXICITY DATA – ORAL/DERMAL ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Oral Cancer Slope Factor*	*Oral to Dermal Adjustment Factor (1)*	*Adjusted Dermal Cancer Slope Factor (2)*	*Units*	*Weight of Evidence/ Cancer Guideline Description*	*Sources of CSF*	*Dates of CSF (3) (MM-YY)*
PCBs							
Aroclor-1248 (PCB-1248)	2.00E+00	100%	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Jun-97
Aroclor-1254 (PCB-1254)	2.00E+00	100%	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Jun-97
Aroclor-1260 (PCB-1260)	2.00E+00	100%	2.00E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Jun-97
Pesticides							
Dieldrin	1.60E+01	100%	1.60E+01	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Jul-93
Heptachlor	4.50E+00	100%	4.50E+00	$(mg/kg\text{-}day)^{-1}$	B2	IRIS	Jul-93
Dioxins/Furans							
Total TEQ	1.30E+05	100%	1.30E+05	$(mg/kg\text{-}day)^{-1}$	B2	RSL	Dec-09

Notes:

-- = Not Available
mg/kg d- milligram per kilogram day
SVOCs - Semi Volatile Organic Compounds
VOCs - Volatile Organic Compounds
CSF - Cancer Slope Factors
PCBs - Polychlorinated biphenyls
TEQ - Toxicity Equivalent
(1) USEPA, Risk Assessment Guidance for Superfund, Volume 1: Human Health Evaluation Manual, Part E Supplemental Guidance for Dermal Risk Assessment, EPA/540/R/99/005, July 2004. USEPA, Technical Guidance Manual Risk Assessment, Assessing Dermal Exposure from Soil, EPA/903-k-95-003, December 1995.
(2) Adjusted Dermal CSF = Oral CSF / Oral to Dermal Adjustment Factor

EPA Weight of Evidence Classification:

A - Known Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen

E - Evidence of noncarcinogenicity

TABLE B.6.2

CANCER TOXICITY DATA – INHALATION ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Unit Risk Factor*	*Units*	*Weight of Evidence/ Cancer Guideline Description*	*Sources of URF*	*Dates of URF (1) (MM-YY)*
VOCs					
1,1-Dichloroethane	1.60E-03	$(mg/m^3)^{-1}$	C	RSL	Dec-09
1,1-Dichloroethene	–	–	C	–	–
1,2-Dichloroethane	2.60E-02	$(mg/m^3)^{-1}$	B2	IRIS	Jan-91
1,4-Dichlorobenzene	1.10E-02	$(mg/m^3)^{-1}$	–	RSL	Dec-09
Benzene	7.80E-03	$(mg/m^3)^{-1}$	A	IRIS	Jan-00
Bromomethane	–	–	D	–	–
Chlorobenzene	–	–	D	–	–
Chloroethane	–	–	–	–	–
Chloroform	2.30E-02	$(mg/m^3)^{-1}$	B2	IRIS	Oct-01
cis-1,2-Dichloroethene	–	–	D	–	–
Cyclohexane	–	–	–	–	–
Dibromochloromethane	2.70E-02	$(mg/m^3)^{-1}$	C	RSL	Dec-09
Dichlorodifluoromethane (CFC 12)	–	–	–	–	–
Ethylbenzene	2.50E-03	$(mg/m^3)^{-1}$	–	RSL	Dec-09
Isopropylbenzene	–	–	D	–	–
Methyl Tert Butyl Ether	2.60E-04	$(mg/m^3)^{-1}$	–	RSL	Dec-09
Methylene chloride	4.70E-04	$(mg/m^3)^{-1}$	B2	IRIS	Feb-95
Tetrachloroethene	5.90E-03	$(mg/m^3)^{-1}$	–	RSL	Dec-09
Toluene	–	–	–	–	–
trans-1,2-Dichloroethene	–	–	–	–	–
Trichloroethene	2.00E-03	$(mg/m^3)^{-1}$	–	RSL	Dec-09
Trichlorofluoromethane	–	–	–	–	–
Vinyl Chloride	4.40E-03	$(mg/m^3)^{-1}$	A	IRIS	Aug-00
Xylenes (total)	–	–	–	–	–

TABLE B.6.2

CANCER TOXICITY DATA -- INHALATION ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Unit Risk Factor*	*Units*	*Weight of Evidence/ Cancer Guideline Description*	*Sources of URF*	*Dates of URF (1) (MM-YY)*
SVOCs					
2-Methylnaphthalene	--	--	--	--	--
Benzo(a)anthracene	1.10E-01	$(mg/m^3)^{-1}$	B2	RSL	Dec-09
Benzo(a)pyrene	1.10E+00	$(mg/m^3)^{-1}$	B2	RSL	Dec-09
Benzo(b)fluoranthene	1.10E-01	$(mg/m^3)^{-1}$	B2	RSL	Dec-09
Benzo(k)fluoranthene	1.10E-01	$(mg/m^3)^{-1}$	B2	RSL	Dec-09
bis(2-Ethylhexyl)phthalate	2.40E-03	$(mg/m^3)^{-1}$	B2	RSL	Dec-09
Dibenz(a,h)anthracene	1.20E+00	$(mg/m^3)^{-1}$	B2	RSL	Dec-09
Indeno(1,2,3-cd)pyrene	1.10E-01	$(mg/m^3)^{-1}$	B2	RSL	Dec-09
Naphthalene	3.40E-02	$(mg/m^3)^{-1}$	C	RSL	Dec-09
Metals					
Aluminum	--	--	--	--	--
Antimony	--	--	--	--	--
Arsenic	4.30E+00	$(mg/m^3)^{-1}$	A	IRIS	Apr-98
Barium	--	--	D	--	--
Cadmium	1.80E+00	$(mg/m^3)^{-1}$	B1	IRIS	Jun-92
Cobalt	--	--	--	--	--
Copper	--	--	D	--	--
Iron	--	--	--	--	--
Lead	--	--	B2	--	--
Manganese	--	--	D	--	--
Mercury	--	--	D	--	--
Nickel	2.60E-01	$(mg/m^3)^{-1}$	--	RSL	Dec-09
Selenium	--	--	D	--	--
Vanadium	--	--	--	--	--
Zinc	--	--	D	--	--

TABLE B.6.2

CANCER TOXICITY DATA – INHALATION ROUTE OF EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern	*Unit Risk Factor*	*Units*	*Weight of Evidence/ Cancer Guideline Description*	*Sources of URF*	*Dates of URF (1) (MM-YY)*
PCBs					
Aroclor-1248 (PCB-1248)	5.70E-01	$(mg/m^3)^{-1}$	B2	IRIS	Jun-97
Aroclor-1254 (PCB-1254)	5.70E-01	$(mg/m^3)^{-1}$	B2	IRIS	Jun-97
Aroclor-1260 (PCB-1260)	5.70E-01	$(mg/m^3)^{-1}$	B2	IRIS	Jun-97
Pesticides					
Dieldrin	4.60E+00	$(mg/m^3)^{-1}$	B2	IRIS	Jul-93
Heptachlor	1.30E+00	$(mg/m^3)^{-1}$	B2	IRIS	Jul-93
Dioxins/Furans					
Total TEQ	3.80E+04	$(mg/m^3)^{-1}$	B2	RSL	Dec-09

Notes:

– = Not Available

mg/m^3 - milligram per cubic meter

SVOCs - Semi Volatile Organic Compounds

VOCs - Volatile Organic Compounds

URF - Unit Risk Factors

PCBs - Polychlorinated biphenyls

TEQ - Toxicity Equivalent

(1) Integrated Risk Information System (IRIS) Database, February 2010.

Note: dates of URF provided is the last revision date of the IRIS toxicity data provided (http://cfpub.epa.gov/ncea/iris/index.cfm?fuseaction=iris.showSubstanceList).

Regional Screening Level Table (RSL) Master, December 2009.

Health Effects Assessment Summary Table (HEAST), July 1997.

EPA Weight of Evidence Classification :

A - Known Human carcinogen

TABLE B.7.1.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE TRESPASSER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil Gas	Ambient Air	On Site	Inhalation	Benzene	1.31E+00	µg/m³	9.16E-07	mg/m³	7.80E-03	(mg/m³)⁻¹	7.14E-09	6.41E-06	mg/m³	3.00E-02	mg/m³	2.14E-04
				Ethylbenzene	3.80E+00	µg/m³	2.67E-06	mg/m³	2.50E-03	(mg/m³)⁻¹	6.67E-09	1.87E-05	mg/m³	1.00E+00	mg/m³	1.87E-05
				Naphthalene	4.41E-02	µg/m³	3.10E-08	mg/m³	3.40E-02	(mg/m³)⁻¹	1.05E-09	2.17E-07	mg/m³	3.00E-03	mg/m³	7.22E-05
				Trichloroethene	4.68E+00	µg/m³	3.28E-06	mg/m³	2.00E-03	(mg/m³)⁻¹	6.57E-09	2.30E-05	mg/m³	--	mg/m³	NC
				Vinyl chloride	5.88E-01	µg/m³	4.12E-07	mg/m³	4.40E-03	(mg/m³)⁻¹	1.81E-09	2.89E-06	mg/m³	1.00E-01	mg/m³	2.89E-05
			Exp. Route Total								2.32E-08					3.33E-04
		Exposure Point Total									2.32E-08					3.33E-04
	Exposure Medium Total										2.32E-08					3.33E-04
Medium Total											2.32E-08					3.33E-04
Surface Soil	Surface Soil	On Site	Ingestion	Benzo(a)anthracene	3.13E+03	µg/kg	6.89E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	5.03E-08	4.82E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	3.52E-08	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	2.57E-07	2.46E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	8.12E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	5.93E-08	5.68E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	3.14E-08	mg/kg-d	7.30E-02	(mg/kg-d)⁻¹	2.30E-09	2.20E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	1.01E-08	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	7.36E-08	7.05E-08	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	2.91E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	2.13E-08	2.04E-07	mg/kg-d	--	mg/kg-d	NC
				Aluminum	7.32E+06	µg/kg	1.61E-04	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.13E-03	mg/kg-d	1.00E+00	mg/kg-d	1.13E-03
				Antimony	3.91E+04	µg/kg	8.60E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	6.02E-06	mg/kg-d	4.00E-04	mg/kg-d	1.50E-02
				Arsenic	5.13E+04	µg/kg	1.13E-06	mg/kg-d	1.50E+00	(mg/kg-d)⁻¹	1.69E-06	7.91E-06	mg/kg-d	3.00E-04	mg/kg-d	2.64E-02
				Barium	6.60E+06	µg/kg	1.45E-04	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.02E-03	mg/kg-d	2.00E-01	mg/kg-d	5.09E-03
				Cadmium	7.72E+03	µg/kg	1.70E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.19E-06	mg/kg-d	5.00E-04	mg/kg-d	2.38E-03
				Cobalt	1.05E+04	µg/kg	2.31E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.62E-06	mg/kg-d	3.00E-04	mg/kg-d	5.39E-03
				Copper	9.53E+07	µg/kg	2.10E-03	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.47E-02	mg/kg-d	4.00E-02	mg/kg-d	3.67E-01
				Iron	3.80E+07	µg/kg	8.36E-04	mg/kg-d	--	(mg/kg-d)⁻¹	NC	5.85E-03	mg/kg-d	7.00E-01	mg/kg-d	8.36E-03
				Lead	3.51E+06	µg/kg	7.73E-05	mg/kg-d	--	(mg/kg-d)⁻¹	NC	5.41E-04	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.84E+05	µg/kg	8.45E-06	mg/kg-d	--	(mg/kg-d)⁻¹	NC	5.91E-05	mg/kg-d	2.40E-02	mg/kg-d	2.46E-03
				Nickel	2.67E+05	µg/kg	5.89E-06	mg/kg-d	--	(mg/kg-d)⁻¹	NC	4.12E-05	mg/kg-d	2.00E-02	mg/kg-d	2.06E-03
				Vanadium	3.97E+04	µg/kg	8.74E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	6.12E-06	mg/kg-d	7.00E-03	mg/kg-d	8.74E-04
				Zinc	2.08E+06	µg/kg	4.58E-05	mg/kg-d	--	(mg/kg-d)⁻¹	NC	3.21E-04	mg/kg-d	3.00E-01	mg/kg-d	1.07E-03
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	3.59E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	7.19E-08	2.52E-07	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	1.83E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	3.65E-08	1.28E-07	mg/kg-d	2.00E-05	mg/kg-d	6.39E-03
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	1.22E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	2.44E-08	8.53E-08	mg/kg-d	--	mg/kg-d	NC
				Total TEQ	1.20E-02	µg/kg	2.64E-13	mg/kg-d	1.30E+05	(mg/kg-d)⁻¹	3.43E-08	1.85E-12	mg/kg-d	1.00E-09	mg/kg-d	1.85E-03
			Exp. Route Total								2.32E-06					4.46E-01

TABLE B.7.1.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE TRESPASSER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	On Site	Dermal	Benzo(a)anthracene	3.13E+03	µg/kg	1.40E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.02E-08	9.78E-08	mg/kg-d	–	mg/kg-d	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	7.13E-09	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	5.21E-08	4.99E-08	mg/kg-d	–	mg/kg-d	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	1.65E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.20E-08	1.15E-07	mg/kg-d	–	mg/kg-d	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	6.38E-09	mg/kg-d	7.30E-02	(mg/kg-d)$^{-1}$	4.66E-10	4.46E-08	mg/kg-d	–	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	2.04E-09	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.49E-08	1.43E-08	mg/kg-d	–	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	5.91E-09	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	4.31E-09	4.14E-08	mg/kg-d	–	mg/kg-d	NC
				Aluminum	7.32E+06	µg/kg	2.51E-06	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	1.76E-05	mg/kg-d	1.00E+00	mg/kg-d	1.76E-05
				Antimony	3.91E+04	µg/kg	1.34E-08	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	9.39E-08	mg/kg-d	6.00E-05	mg/kg-d	1.57E-03
				Arsenic	5.13E+04	µg/kg	5.29E-08	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	7.93E-08	3.70E-07	mg/kg-d	3.00E-04	mg/kg-d	1.23E-03
				Barium	6.60E+06	µg/kg	2.27E-06	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	1.59E-05	mg/kg-d	1.40E-02	mg/kg-d	1.13E-03
				Cadmium	7.72E+03	µg/kg	2.65E-10	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	1.86E-09	mg/kg-d	2.50E-05	mg/kg-d	7.42E-05
				Cobalt	1.05E+04	µg/kg	3.61E-09	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	2.52E-08	mg/kg-d	3.00E-04	mg/kg-d	8.41E-05
				Copper	9.53E+07	µg/kg	3.27E-05	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	2.29E-04	mg/kg-d	4.00E-02	mg/kg-d	5.73E-03
				Iron	3.80E+07	µg/kg	1.30E-05	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	9.13E-05	mg/kg-d	7.00E-01	mg/kg-d	1.30E-04
				Lead	3.51E+06	µg/kg	1.21E-06	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	8.44E-06	mg/kg-d	–	mg/kg-d	NC
				Manganese	3.84E+05	µg/kg	1.32E-07	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	9.22E-07	mg/kg-d	9.60E-04	mg/kg-d	9.61E-04
				Nickel	2.67E+05	µg/kg	9.18E-08	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	6.43E-07	mg/kg-d	2.00E-02	mg/kg-d	3.21E-05
				Vanadium	3.97E+04	µg/kg	1.36E-08	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	9.54E-08	mg/kg-d	1.82E-04	mg/kg-d	5.24E-04
				Zinc	2.08E+06	µg/kg	7.15E-07	mg/kg-d	–	(mg/kg-d)$^{-1}$	NC	5.00E-06	mg/kg-d	3.00E-01	mg/kg-d	1.67E-05
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	7.85E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.57E-08	5.49E-08	mg/kg-d	–	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	3.99E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	7.98E-09	2.79E-08	mg/kg-d	2.00E-05	mg/kg-d	1.40E-03
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	2.66E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	5.33E-09	1.86E-08	mg/kg-d	–	mg/kg-d	NC
				Total TEQ	1.20E-02	µg/kg	4.12E-14	mg/kg-d	1.30E+05	(mg/kg-d)$^{-1}$	5.36E-09	2.88E-13	mg/kg-d	1.00E-09	mg/kg-d	2.88E-04
			Exp. Route Total								2.08E-07					1.32E-02
		Exposure Point Total									2.53E-06					4.59E-01
	Exposure Medium Total										2.53E-06					4.59E-01

TABLE B.7.1.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE TRESPASSER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Ambient Air	On Site	Inhalation	Benzo(a)anthracene	3.13E+03	µg/kg	1.61E-12	mg/m³	1.10E-01	(mg/m³)⁻¹	1.78E-13	1.13E-11	mg/m³	--	mg/m³	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	8.24E-13	mg/m³	1.10E+00	(mg/m³)⁻¹	9.07E-13	5.77E-12	mg/m³	--	mg/m³	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	2.56E-09	mg/m³	1.10E-01	(mg/m³)⁻¹	2.81E-10	1.79E-08	mg/m³	--	mg/m³	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	7.37E-13	mg/m³	1.10E-01	(mg/m³)⁻¹	8.11E-14	5.16E-12	mg/m³	--	mg/m³	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	2.36E-13	mg/m³	1.20E+00	(mg/m³)⁻¹	2.83E-13	1.65E-12	mg/m³	--	mg/m³	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	6.83E-13	mg/m³	1.10E-01	(mg/m³)⁻¹	7.51E-14	4.78E-12	mg/m³	--	mg/m³	NC
				Aluminum	7.32E+06	µg/kg	3.78E-09	mg/m³	--	(mg/m³)⁻¹	NC	2.64E-08	mg/m³	5.00E-03	mg/m³	5.29E-06
				Antimony	3.91E+04	µg/kg	2.02E-11	mg/m³	--	(mg/m³)⁻¹	NC	1.41E-10	mg/m³	--	mg/m³	NC
				Arsenic	5.13E+04	µg/kg	2.65E-11	mg/m³	4.30E+00	(mg/m³)⁻¹	1.14E-10	1.85E-10	mg/m³	1.50E-05	mg/m³	1.24E-05
				Barium	6.60E+06	µg/kg	3.41E-09	mg/m³	--	(mg/m³)⁻¹	NC	2.38E-08	mg/m³	5.00E-04	mg/m³	4.77E-05
				Cadmium	7.72E+03	µg/kg	3.98E-12	mg/m³	1.80E+00	(mg/m³)⁻¹	7.17E-12	2.79E-11	mg/m³	1.00E-05	mg/m³	2.79E-06
				Cobalt	1.05E+04	µg/kg	5.42E-12	mg/m³	--	(mg/m³)⁻¹	NC	3.79E-11	mg/m³	6.00E-06	mg/m³	6.32E-06
				Copper	9.53E+07	µg/kg	4.92E-08	mg/m³	--	(mg/m³)⁻¹	NC	3.44E-07	mg/m³	--	mg/m³	NC
				Iron	3.80E+07	µg/kg	1.96E-08	mg/m³	--	(mg/m³)⁻¹	NC	1.37E-07	mg/m³	--	mg/m³	NC
				Lead	3.51E+06	µg/kg	1.81E-09	mg/m³	--	(mg/m³)⁻¹	NC	1.27E-08	mg/m³	--	mg/m³	NC
				Manganese	3.84E+05	µg/kg	1.98E-10	mg/m³	--	(mg/m³)⁻¹	NC	1.39E-09	mg/m³	5.00E-05	mg/m³	2.77E-05
				Vanadium	3.97E+04	µg/kg	2.05E-11	mg/m³	--	(mg/m³)⁻¹	NC	1.43E-10	mg/m³	--	mg/m³	NC
				Zinc	2.08E+06	µg/kg	1.07E-09	mg/m³	--	(mg/m³)⁻¹	NC	7.52E-09	mg/m³	--	mg/m³	NC
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	8.42E-13	mg/m³	5.70E-01	(mg/m³)⁻¹	4.80E-13	5.90E-12	mg/m³	--	mg/m³	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	4.28E-13	mg/m³	5.70E-01	(mg/m³)⁻¹	2.44E-13	3.00E-12	mg/m³	--	mg/m³	NC
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	2.86E-13	mg/m³	5.70E-01	(mg/m³)⁻¹	1.63E-13	2.00E-12	mg/m³	--	mg/m³	NC
				Total TEQ	1.20E-02	µg/kg	6.19E-18	mg/m³	3.80E+04	(mg/m³)⁻¹	2.35E-13	4.33E-17	mg/m³	4.00E-08	mg/m³	1.08E-09
			Exp. Route Total								4.05E-10					1.02E-04
		Exposure Point Total									4.05E-10					1.02E-04
	Exposure Medium Total										4.05E-10					1.02E-04
Medium Total											2.53E-06					4.59E-01

TABLE B.7.1.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE TRESPASSER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	On Site	Ingestion	Benzo(a)anthracene	1.50E+03	µg/kg	3.30E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.41E-08	2.31E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	3.96E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	2.89E-07	2.77E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	5.50E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	4.02E-08	3.85E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	1.06E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	7.71E-08	7.39E-08	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	4.18E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	3.05E-08	2.93E-07	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	2.77E-07	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	4.16E-07	1.94E-06	mg/kg-d	3.00E-04	mg/kg-d	6.47E-03
				Cobalt	6.70E+03	µg/kg	1.47E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.03E-06	mg/kg-d	3.00E-04	mg/kg-d	3.44E-03
				Iron	1.35E+07	µg/kg	2.97E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.08E-03	mg/kg-d	7.00E-01	mg/kg-d	2.97E-03
				Manganese	5.45E+05	µg/kg	1.20E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	8.39E-05	mg/kg-d	2.40E-02	mg/kg-d	3.50E-03
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	1.45E-08	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	2.90E-08	1.02E-07	mg/kg-d	2.00E-05	mg/kg-d	5.08E-03
			Exp. Route Total								9.06E-07					2.15E-02
			Dermal	Benzo(a)anthracene	1.50E+03	µg/kg	6.69E-09	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	4.89E-09	4.69E-08	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	8.03E-09	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	5.86E-08	5.62E-08	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	1.12E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	8.14E-09	7.81E-08	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	2.14E-09	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.56E-08	1.50E-08	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	8.48E-09	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	6.19E-09	5.94E-08	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	1.30E-08	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	1.95E-08	9.08E-08	mg/kg-d	3.00E-04	mg/kg-d	3.03E-04
				Cobalt	6.70E+03	µg/kg	2.30E-09	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.61E-08	mg/kg-d	3.00E-04	mg/kg-d	5.37E-05
				Iron	1.35E+07	µg/kg	4.63E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.24E-05	mg/kg-d	7.00E-01	mg/kg-d	4.63E-05
				Manganese	5.45E+05	µg/kg	1.87E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.31E-06	mg/kg-d	9.60E-04	mg/kg-d	1.36E-03
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	3.17E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	6.34E-09	2.22E-08	mg/kg-d	2.00E-05	mg/kg-d	1.11E-03
			Exp. Route Total								1.19E-07					2.88E-03
		Exposure Point Total									1.03E-06					2.43E-02
	Exposure Medium Total										1.03E-06					2.43E-02
Medium Total											1.03E-06					2.43E-02
							Total of Receptor Risks Across All Media				3.6E-06	Total of Receptor Hazards Across All Media				4.8E-01

Notes:

NC = Not Calculated

TABLE B.7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE TRESPASSER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil Gas	Ambient Air	On Site	Inhalation	Benzene	1.31E+00	µg/m³	3.66E-06	mg/m³	7.80E-03	(mg/m³)⁻¹	2.86E-08	2.56E-05	mg/m³	3.00E-02	mg/m³	8.55E-04
				Ethylbenzene	3.80E+00	µg/m³	1.07E-05	mg/m³	2.50E-03	(mg/m³)⁻¹	2.67E-08	7.47E-05	mg/m³	1.00E+00	mg/m³	7.47E-05
				Naphthalene	4.41E-02	µg/m³	1.24E-07	mg/m³	3.40E-02	(mg/m³)⁻¹	4.21E-09	8.67E-07	mg/m³	3.00E-03	mg/m³	2.89E-04
				Trichloroethene	4.68E+00	µg/m³	1.31E-05	mg/m³	2.00E-03	(mg/m³)⁻¹	2.63E-08	9.20E-05	mg/m³	–	mg/m³	NC
				Vinyl chloride	5.88E-01	µg/m³	1.65E-06	mg/m³	4.40E-03	(mg/m³)⁻¹	7.26E-09	1.15E-05	mg/m³	1.00E-01	mg/m³	1.15E-04
			Exp. Route Total								9.30E-08					1.33E-03
		Exposure Point Total									9.30E-08					1.33E-03
	Exposure Medium Total										9.30E-08					1.33E-03
Medium Total											9.30E-08					1.33E-03
Surface Soil	Surface Soil	On Site	Ingestion	Benzo(a)anthracene	3.13E+03	µg/kg	1.38E-07	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	1.01E-07	9.64E-07	mg/kg-d	–	mg/kg-d	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	7.03E-08	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	5.13E-07	4.92E-07	mg/kg-d	–	mg/kg-d	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	1.62E-07	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	1.19E-07	1.14E-06	mg/kg-d	–	mg/kg-d	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	6.29E-08	mg/kg-d	7.30E-02	(mg/kg-d)⁻¹	4.59E-09	4.40E-07	mg/kg-d	–	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	2.02E-08	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	1.47E-07	1.41E-07	mg/kg-d	–	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	5.83E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	4.25E-08	4.08E-07	mg/kg-d	–	mg/kg-d	NC
				Aluminum	7.32E+06	µg/kg	3.22E-04	mg/kg-d	–	(mg/kg-d)⁻¹	NC	2.26E-03	mg/kg-d	1.00E+00	mg/kg-d	2.26E-03
				Antimony	3.91E+04	µg/kg	1.72E-06	mg/kg-d	–	(mg/kg-d)⁻¹	NC	1.20E-05	mg/kg-d	4.00E-04	mg/kg-d	3.01E-02
				Arsenic	5.13E+04	µg/kg	2.26E-06	mg/kg-d	1.50E+00	(mg/kg-d)⁻¹	3.39E-06	1.58E-05	mg/kg-d	3.00E-04	mg/kg-d	5.27E-02
				Barium	6.60E+06	µg/kg	2.91E-04	mg/kg-d	–	(mg/kg-d)⁻¹	NC	2.03E-03	mg/kg-d	2.00E-01	mg/kg-d	1.02E-02
				Cadmium	7.72E+03	µg/kg	3.40E-07	mg/kg-d	–	(mg/kg-d)⁻¹	NC	2.38E-06	mg/kg-d	5.00E-04	mg/kg-d	4.76E-03
				Cobalt	1.05E+04	µg/kg	4.62E-07	mg/kg-d	–	(mg/kg-d)⁻¹	NC	3.24E-06	mg/kg-d	3.00E-04	mg/kg-d	1.08E-02
				Copper	9.53E+07	µg/kg	4.20E-03	mg/kg-d	–	(mg/kg-d)⁻¹	NC	2.94E-02	mg/kg-d	4.00E-02	mg/kg-d	7.34E-01
				Iron	3.80E+07	µg/kg	1.67E-03	mg/kg-d	–	(mg/kg-d)⁻¹	NC	1.17E-02	mg/kg-d	7.00E-01	mg/kg-d	1.67E-02
				Lead	3.51E+06	µg/kg	1.55E-04	mg/kg-d	–	(mg/kg-d)⁻¹	NC	1.08E-03	mg/kg-d	–	mg/kg-d	NC
				Manganese	3.84E+05	µg/kg	1.69E-05	mg/kg-d	–	(mg/kg-d)⁻¹	NC	1.18E-04	mg/kg-d	2.40E-02	mg/kg-d	4.93E-03
				Nickel	2.67E+05	µg/kg	1.18E-05	mg/kg-d	–	(mg/kg-d)⁻¹	NC	8.24E-05	mg/kg-d	2.00E-02	mg/kg-d	4.12E-03
				Vanadium	3.97E+04	µg/kg	1.75E-06	mg/kg-d	–	(mg/kg-d)⁻¹	NC	1.22E-05	mg/kg-d	7.00E-03	mg/kg-d	1.75E-03
				Zinc	2.08E+06	µg/kg	9.16E-05	mg/kg-d	–	(mg/kg-d)⁻¹	NC	6.41E-04	mg/kg-d	3.00E-01	mg/kg-d	2.14E-03
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	7.19E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	1.44E-07	5.03E-07	mg/kg-d	–	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	3.65E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	7.31E-08	2.56E-07	mg/kg-d	2.00E-05	mg/kg-d	1.28E-02
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	2.44E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	4.88E-08	1.71E-07	mg/kg-d	–	mg/kg-d	NC
				Total TEQ	1.20E-02	µg/kg	5.28E-13	mg/kg-d	1.30E+05	(mg/kg-d)⁻¹	6.87E-08	3.70E-12	mg/kg-d	1.00E-09	mg/kg-d	3.70E-03
			Exp. Route Total								4.65E-06					8.91E-01

TABLE B.7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE TRESPASSER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	On Site	Dermal	Benzo(a)anthracene	3.13E+03	µg/kg	1.40E-07	mg/kg-d	7.30E-01	$(mg/kg\text{-}d)^{-1}$	1.02E-07	9.78E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	7.13E-08	mg/kg-d	7.30E+00	$(mg/kg\text{-}d)^{-1}$	5.21E-07	4.99E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	1.65E-07	mg/kg-d	7.30E-01	$(mg/kg\text{-}d)^{-1}$	1.20E-07	1.15E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	6.38E-08	mg/kg-d	7.30E-02	$(mg/kg\text{-}d)^{-1}$	4.66E-09	4.46E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	2.04E-08	mg/kg-d	7.30E+00	$(mg/kg\text{-}d)^{-1}$	1.49E-07	1.43E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	5.91E-08	mg/kg-d	7.30E-01	$(mg/kg\text{-}d)^{-1}$	4.31E-08	4.14E-07	mg/kg-d	--	mg/kg-d	NC
				Aluminum	7.32E+06	µg/kg	2.51E-05	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	1.76E-04	mg/kg-d	1.00E+00	mg/kg-d	1.76E-04
				Antimony	3.91E+04	µg/kg	1.34E-07	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	9.39E-07	mg/kg-d	6.00E-05	mg/kg-d	1.57E-02
				Arsenic	5.13E+04	µg/kg	5.29E-07	mg/kg-d	1.50E+00	$(mg/kg\text{-}d)^{-1}$	7.93E-07	3.70E-06	mg/kg-d	3.00E-04	mg/kg-d	1.23E-02
				Barium	6.60E+06	µg/kg	2.27E-05	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	1.59E-04	mg/kg-d	1.40E-02	mg/kg-d	1.13E-02
				Cadmium	7.72E+03	µg/kg	2.65E-09	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	1.86E-08	mg/kg-d	2.50E-05	mg/kg-d	7.42E-04
				Cobalt	1.05E+04	µg/kg	3.61E-08	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	2.52E-07	mg/kg-d	3.00E-04	mg/kg-d	8.41E-04
				Copper	9.53E+07	µg/kg	3.27E-04	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	2.29E-03	mg/kg-d	4.00E-02	mg/kg-d	5.73E-02
				Iron	3.80E+07	µg/kg	1.30E-04	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	9.13E-04	mg/kg-d	7.00E-01	mg/kg-d	1.30E-03
				Lead	3.51E+06	µg/kg	1.21E-05	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	8.44E-05	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.84E+05	µg/kg	1.32E-06	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	9.22E-06	mg/kg-d	9.60E-04	mg/kg-d	9.61E-03
				Nickel	2.67E+05	µg/kg	9.18E-07	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	6.43E-06	mg/kg-d	2.00E-02	mg/kg-d	3.21E-04
				Vanadium	3.97E+04	µg/kg	1.36E-07	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	9.54E-07	mg/kg-d	1.82E-04	mg/kg-d	5.24E-03
				Zinc	2.08E+06	µg/kg	7.15E-06	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	5.00E-05	mg/kg-d	3.00E-01	mg/kg-d	1.67E-04
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	7.85E-08	mg/kg-d	2.00E+00	$(mg/kg\text{-}d)^{-1}$	1.57E-07	5.49E-07	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	3.99E-08	mg/kg-d	2.00E+00	$(mg/kg\text{-}d)^{-1}$	7.98E-08	2.79E-07	mg/kg-d	2.00E-05	mg/kg-d	1.40E-02
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	2.66E-08	mg/kg-d	2.00E+00	$(mg/kg\text{-}d)^{-1}$	5.33E-08	1.86E-07	mg/kg-d	--	mg/kg-d	NC
				Total TEQ	1.20E-02	µg/kg	4.12E-13	mg/kg-d	1.30E+05	$(mg/kg\text{-}d)^{-1}$	5.36E-08	2.88E-12	mg/kg-d	1.00E-09	mg/kg-d	2.88E-03
			Exp. Route Total								2.08E-06					1.32E-01
		Exposure Point Total									6.73E-06					1.02E+00
	Exposure Medium Total										6.73E-06					1.02E+00

TABLE B.7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE TRESPASSER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Ambient Air	On Site	Inhalation	Benzo(a)anthracene	3.13E+03	µg/kg	6.46E-12	mg/m³	1.10E-01	(mg/m³)⁻¹	7.10E-13	4.52E-11	mg/m³	–	mg/m³	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	3.30E-12	mg/m³	1.10E+00	(mg/m³)⁻¹	3.63E-12	2.31E-11	mg/m³	–	mg/m³	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	1.02E-08	mg/m³	1.10E-01	(mg/m³)⁻¹	1.12E-09	7.15E-08	mg/m³	–	mg/m³	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	2.95E-12	mg/m³	1.10E-01	(mg/m³)⁻¹	3.24E-13	2.06E-11	mg/m³	–	mg/m³	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	9.45E-13	mg/m³	1.20E+00	(mg/m³)⁻¹	1.13E-12	6.61E-12	mg/m³	–	mg/m³	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	2.73E-12	mg/m³	1.10E-01	(mg/m³)⁻¹	3.00E-13	1.91E-11	mg/m³	–	mg/m³	NC
				Aluminum	7.32E+06	µg/kg	1.51E-08	mg/m³	–	(mg/m³)⁻¹	NC	1.06E-07	mg/m³	5.00E-03	mg/m³	2.12E-05
				Antimony	3.91E+04	µg/kg	8.06E-11	mg/m³	–	(mg/m³)⁻¹	NC	5.64E-10	mg/m³	–	mg/m³	NC
				Arsenic	5.13E+04	µg/kg	1.06E-10	mg/m³	4.30E+00	(mg/m³)⁻¹	4.55E-10	7.41E-10	mg/m³	1.50E-05	mg/m³	4.94E-05
				Barium	6.60E+06	µg/kg	1.36E-08	mg/m³	–	(mg/m³)⁻¹	NC	9.54E-08	mg/m³	5.00E-04	mg/m³	1.91E-04
				Cadmium	7.72E+03	µg/kg	1.59E-11	mg/m³	1.80E+00	(mg/m³)⁻¹	2.87E-11	1.12E-10	mg/m³	1.00E-05	mg/m³	1.12E-05
				Cobalt	1.05E+04	µg/kg	2.17E-11	mg/m³	–	(mg/m³)⁻¹	NC	1.52E-10	mg/m³	6.00E-06	mg/m³	2.53E-05
				Copper	9.53E+07	µg/kg	1.97E-07	mg/m³	–	(mg/m³)⁻¹	NC	1.38E-06	mg/m³	–	mg/m³	NC
				Iron	3.80E+07	µg/kg	7.84E-08	mg/m³	–	(mg/m³)⁻¹	NC	5.48E-07	mg/m³	–	mg/m³	NC
				Lead	3.51E+06	µg/kg	7.25E-09	mg/m³	–	(mg/m³)⁻¹	NC	5.07E-08	mg/m³	–	mg/m³	NC
				Manganese	3.84E+05	µg/kg	7.92E-10	mg/m³	–	(mg/m³)⁻¹	NC	5.54E-09	mg/m³	5.00E-05	mg/m³	1.11E-04
				Nickel	2.67E+05	µg/kg	5.52E-10	mg/m³	2.60E-01	(mg/m³)⁻¹	1.43E-10	3.86E-09	mg/m³	9.00E-05	mg/m³	4.29E-05
				Vanadium	3.97E+04	µg/kg	8.19E-11	mg/m³	–	(mg/m³)⁻¹	NC	5.73E-10	mg/m³	–	mg/m³	NC
				Zinc	2.08E+06	µg/kg	4.29E-09	mg/m³	–	(mg/m³)⁻¹	NC	3.01E-08	mg/m³	–	mg/m³	NC
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	3.37E-12	mg/m³	5.70E-01	(mg/m³)⁻¹	1.92E-12	2.36E-11	mg/m³	–	mg/m³	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	1.71E-12	mg/m³	5.70E-01	(mg/m³)⁻¹	9.76E-13	1.20E-11	mg/m³	–	mg/m³	NC
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	1.14E-12	mg/m³	5.70E-01	(mg/m³)⁻¹	6.51E-13	8.00E-12	mg/m³	–	mg/m³	NC
				Total TEQ	1.20E-02	µg/kg	2.48E-17	mg/m³	3.80E+04	(mg/m³)⁻¹	9.41E-13	1.73E-16	mg/m³	4.00E-08	mg/m³	4.33E-09
			Exp. Route Total								1.76E-09					4.52E-04
		Exposure Point Total									1.76E-09					4.52E-04
	Exposure Medium Total										1.76E-09					4.52E-04
Medium Total											6.73E-06					1.02E+00

TABLE B.7.1.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE TRESPASSER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	On Site	Ingestion	Benzo(a)anthracene	1.50E+03	µg/kg	6.60E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	4.82E-08	4.62E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	7.92E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	5.78E-07	5.55E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	1.10E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	8.03E-08	7.70E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	2.11E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.54E-07	1.48E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	8.36E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	6.10E-08	5.85E-07	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	5.55E-07	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	8.32E-07	3.88E-06	mg/kg-d	3.00E-04	mg/kg-d	1.29E-02
				Cobalt	6.70E+03	µg/kg	2.95E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.06E-06	mg/kg-d	3.00E-04	mg/kg-d	6.88E-03
				Iron	1.35E+07	µg/kg	5.94E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.16E-03	mg/kg-d	7.00E-01	mg/kg-d	5.94E-03
				Manganese	5.45E+05	µg/kg	2.40E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.68E-04	mg/kg-d	2.40E-02	mg/kg-d	7.00E-03
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	2.90E-08	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	5.81E-08	2.03E-07	mg/kg-d	2.00E-05	mg/kg-d	1.02E-02
			Exp. Route Total								1.81E-06					4.29E-02
			Dermal	Benzo(a)anthracene	1.50E+03	µg/kg	6.69E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	4.89E-08	4.69E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	8.03E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	5.86E-07	5.62E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	1.12E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	8.14E-08	7.81E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	2.14E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.56E-07	1.50E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	8.48E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	6.19E-08	5.94E-07	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	1.30E-07	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	1.95E-07	9.08E-07	mg/kg-d	3.00E-04	mg/kg-d	3.03E-03
				Cobalt	6.70E+03	µg/kg	2.30E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.61E-07	mg/kg-d	3.00E-04	mg/kg-d	5.37E-04
				Iron	1.35E+07	µg/kg	4.63E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.24E-04	mg/kg-d	7.00E-01	mg/kg-d	4.63E-04
				Manganese	5.45E+05	µg/kg	1.87E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.31E-05	mg/kg-d	9.60E-04	mg/kg-d	1.36E-02
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	3.17E-08	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	6.34E-08	2.22E-07	mg/kg-d	2.00E-05	mg/kg-d	1.11E-02
			Exp. Route Total								1.19E-06					2.88E-02
		Exposure Point Total									3.00E-06					7.17E-02
	Exposure Medium Total										3.00E-06					7.17E-02
Medium Total											3.00E-06					7.17E-02
							Total of Receptor Risks Across All Media				9.8E-06	Total of Receptor Hazards Across All Media				1.1E+00

Notes:

NC = Not Calculated

TABLE B.7.2.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil Gas	Indoor Air	On Site	Inhalation	1,1-Dichloroethane	1.10E+00	µg/m³	2.84E-05	mg/m³	1.60E-03	(mg/m³)⁻¹	4.54E-08	2.21E-04	mg/m³	–	mg/m³	NC
				1,1-Dichloroethene	6.21E-02	µg/m³	1.60E-06	mg/m³	–	(mg/m³)⁻¹	NC	1.24E-05	mg/m³	2.00E-01	mg/m³	6.21E-05
				1,4-Dichlorobenzene	1.95E-03	µg/m³	5.01E-08	mg/m³	1.10E-02	(mg/m³)⁻¹	5.51E-10	3.90E-07	mg/m³	8.00E-01	mg/m³	4.87E-07
				Benzene	7.41E+00	µg/m³	1.91E-04	mg/m³	7.80E-03	(mg/m³)⁻¹	1.49E-06	1.48E-03	mg/m³	3.00E-02	mg/m³	4.94E-02
				Bromomethane	7.98E-03	µg/m³	2.05E-07	mg/m³	–	(mg/m³)⁻¹	NC	1.60E-06	mg/m³	5.00E-03	mg/m³	3.19E-04
				Chlorobenzene	6.37E+00	µg/m³	1.64E-04	mg/m³	–	(mg/m³)⁻¹	NC	1.27E-03	mg/m³	5.00E-02	mg/m³	2.55E-02
				Chloroethane	2.94E-01	µg/m³	7.55E-06	mg/m³	–	(mg/m³)⁻¹	NC	5.87E-05	mg/m³	1.00E+01	mg/m³	5.87E-06
				Chloroform	3.28E-02	µg/m³	8.45E-07	mg/m³	2.30E-02	(mg/m³)⁻¹	1.94E-08	6.57E-06	mg/m³	9.80E-02	mg/m³	6.70E-05
				cis-1,2-Dichloroethene	8.36E+00	µg/m³	2.15E-04	mg/m³	–	(mg/m³)⁻¹	NC	1.67E-03	mg/m³	–	mg/m³	NC
				Cyclohexane	2.62E+01	µg/m³	6.73E-04	mg/m³	–	(mg/m³)⁻¹	NC	5.24E-03	mg/m³	6.00E+00	mg/m³	8.73E-04
				Dichlorodifluoromethane	6.81E-01	µg/m³	1.75E-05	mg/m³	–	(mg/m³)⁻¹	NC	1.36E-04	mg/m³	2.00E-01	mg/m³	6.81E-04
				Ethylbenzene	2.40E+01	µg/m³	6.17E-04	mg/m³	2.50E-03	(mg/m³)⁻¹	1.54E-06	4.80E-03	mg/m³	1.00E+00	mg/m³	4.80E-03
				Isopropylbenzene	3.69E+00	µg/m³	9.48E-05	mg/m³	–	(mg/m³)⁻¹	NC	7.37E-04	mg/m³	4.00E-01	mg/m³	1.84E-03
				Methyl Tert Butyl Ether	3.99E-02	µg/m³	1.03E-06	mg/m³	2.60E-04	(mg/m³)⁻¹	2.67E-10	7.98E-06	mg/m³	3.00E+00	mg/m³	2.66E-06
				Methylene chloride	1.16E-02	µg/m³	2.98E-07	mg/m³	4.70E-04	(mg/m³)⁻¹	1.40E-10	2.32E-06	mg/m³	1.00E+00	mg/m³	2.32E-06
				Naphthalene	3.22E-01	µg/m³	8.29E-06	mg/m³	3.40E-02	(mg/m³)⁻¹	2.82E-07	6.45E-05	mg/m³	3.00E-03	mg/m³	2.15E-02
				Tetrachloroethene	1.17E-01	µg/m³	3.02E-06	mg/m³	5.90E-03	(mg/m³)⁻¹	1.78E-08	2.35E-05	mg/m³	2.70E-01	mg/m³	8.69E-05
				Toluene	1.53E+00	µg/m³	3.92E-05	mg/m³	–	(mg/m³)⁻¹	NC	3.05E-04	mg/m³	5.00E+00	mg/m³	6.10E-05
				trans-1,2-Dichloroethene	2.04E-01	µg/m³	5.24E-06	mg/m³	–	(mg/m³)⁻¹	NC	4.08E-05	mg/m³	6.00E-02	mg/m³	6.79E-04
				Trichloroethene	2.86E+01	µg/m³	7.35E-04	mg/m³	2.00E-03	(mg/m³)⁻¹	1.47E-06	5.71E-03	mg/m³	–	mg/m³	NC
				Trichlorofluoromethane	1.91E-02	µg/m³	4.91E-07	mg/m³	–	(mg/m³)⁻¹	NC	3.82E-06	mg/m³	7.00E-01	mg/m³	5.45E-06
				Vinyl chloride	2.93E+00	µg/m³	7.54E-05	mg/m³	4.40E-03	(mg/m³)⁻¹	3.32E-07	5.87E-04	mg/m³	1.00E-01	mg/m³	5.87E-03
				Xylenes (total)	2.44E+01	µg/m³	6.28E-04	mg/m³	–	(mg/m³)⁻¹	NC	4.89E-03	mg/m³	1.00E-01	mg/m³	4.89E-02
			Exp. Route Total								5.20E-06					1.61E-01
		Exposure Point Total									5.20E-06					1.61E-01
	Exposure Medium Total										5.20E-06					1.61E-01
Medium Total											5.20E-06					1.61E-01
Soil Gas	Ambient Air	On Site	Inhalation	Benzene	1.31E+00	µg/m³	3.36E-05	mg/m³	7.80E-03	(mg/m³)⁻¹	2.62E-07	2.61E-04	mg/m³	3.00E-02	mg/m³	8.70E-03
				Ethylbenzene	3.80E+00	µg/m³	9.78E-05	mg/m³	2.50E-03	(mg/m³)⁻¹	2.45E-07	7.61E-04	mg/m³	1.00E+00	mg/m³	7.61E-04
				Naphthalene	4.41E-02	µg/m³	1.13E-06	mg/m³	3.40E-02	(mg/m³)⁻¹	3.86E-08	8.83E-06	mg/m³	3.00E-03	mg/m³	2.94E-03
				Trichloroethene	4.68E+00	µg/m³	1.20E-04	mg/m³	2.00E-03	(mg/m³)⁻¹	2.41E-07	9.36E-04	mg/m³	–	mg/m³	NC
				Vinyl chloride	5.88E-01	µg/m³	1.51E-05	mg/m³	4.40E-03	(mg/m³)⁻¹	6.65E-08	1.18E-04	mg/m³	1.00E-01	mg/m³	1.18E-03
			Exp. Route Total								8.52E-07					1.36E-02
		Exposure Point Total									8.52E-07					1.36E-02
	Exposure Medium Total										8.52E-07					1.36E-02
Medium Total											8.52E-07					1.36E-02

TABLE B.7.2.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	On Site	Ingestion	Benzo(a)anthracene	3.13E+03	µg/kg	3.45E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.52E-07	2.68E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	1.76E-07	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.29E-06	1.37E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	4.07E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.97E-07	3.16E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	1.57E-07	mg/kg-d	7.30E-02	(mg/kg-d)$^{-1}$	1.15E-08	1.22E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	5.05E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	3.68E-07	3.93E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	1.46E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.06E-07	1.13E-06	mg/kg-d	--	mg/kg-d	NC
				Aluminum	7.32E+06	µg/kg	8.07E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.28E-03	mg/kg-d	1.00E+00	mg/kg-d	6.28E-03
				Antimony	3.91E+04	µg/kg	4.31E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.35E-05	mg/kg-d	4.00E-04	mg/kg-d	8.37E-02
				Arsenic	5.13E+04	µg/kg	5.66E-06	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	8.49E-06	4.40E-05	mg/kg-d	3.00E-04	mg/kg-d	1.47E-01
				Barium	6.60E+06	µg/kg	7.28E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.66E-03	mg/kg-d	2.00E-01	mg/kg-d	2.83E-02
				Cadmium	7.72E+03	µg/kg	8.51E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.62E-06	mg/kg-d	5.00E-04	mg/kg-d	1.32E-02
				Cobalt	1.05E+04	µg/kg	1.16E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	9.00E-06	mg/kg-d	3.00E-04	mg/kg-d	3.00E-02
				Copper	9.53E+07	µg/kg	1.05E-02	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	8.17E-02	mg/kg-d	4.00E-02	mg/kg-d	2.04E+00
				Iron	3.80E+07	µg/kg	4.19E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.26E-02	mg/kg-d	7.00E-01	mg/kg-d	4.65E-02
				Lead	3.51E+06	µg/kg	3.87E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.01E-03	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.84E+05	µg/kg	4.23E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.29E-04	mg/kg-d	2.40E-02	mg/kg-d	1.37E-02
				Nickel	2.67E+05	µg/kg	2.95E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.29E-04	mg/kg-d	2.00E-02	mg/kg-d	1.15E-02
				Vanadium	3.97E+04	µg/kg	4.38E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.40E-05	mg/kg-d	7.00E-03	mg/kg-d	4.86E-03
				Zinc	2.08E+06	µg/kg	2.29E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.78E-03	mg/kg-d	3.00E-01	mg/kg-d	5.95E-03
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	1.80E-07	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	3.60E-07	1.40E-06	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	9.15E-08	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.83E-07	7.11E-07	mg/kg-d	2.00E-05	mg/kg-d	3.56E-02
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	6.11E-08	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.22E-07	4.75E-07	mg/kg-d	--	mg/kg-d	NC
				Total TEQ	1.20E-02	µg/kg	1.32E-12	mg/kg-d	1.30E+05	(mg/kg-d)$^{-1}$	1.72E-07	1.03E-11	mg/kg-d	1.00E-09	mg/kg-d	1.03E-02
			Exp. Route Total								1.16E-05					2.48E+00
			Dermal	Benzo(a)anthracene	3.13E+03	µg/kg	2.96E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.16E-08	2.30E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	1.51E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.10E-07	1.18E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	3.49E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.55E-08	2.71E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	1.35E-08	mg/kg-d	7.30E-02	(mg/kg-d)$^{-1}$	9.86E-10	1.05E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	4.33E-09	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	3.16E-08	3.37E-08	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	1.25E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	9.14E-09	9.74E-08	mg/kg-d	--	mg/kg-d	NC
				Aluminum	7.32E+06	µg/kg	5.33E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.14E-05	mg/kg-d	1.00E+00	mg/kg-d	4.14E-05
				Antimony	3.91E+04	µg/kg	2.84E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.21E-07	mg/kg-d	6.00E-05	mg/kg-d	3.68E-03
				Arsenic	5.13E+04	µg/kg	1.12E-07	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	1.68E-07	8.71E-07	mg/kg-d	3.00E-04	mg/kg-d	2.90E-03
				Barium	6.60E+06	µg/kg	4.80E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.74E-05	mg/kg-d	1.40E-02	mg/kg-d	2.67E-03
				Cadmium	7.72E+03	µg/kg	5.62E-10	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.37E-09	mg/kg-d	2.50E-05	mg/kg-d	1.75E-04
				Cobalt	1.05E+04	µg/kg	7.64E-09	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.94E-08	mg/kg-d	3.00E-04	mg/kg-d	1.98E-04
				Copper	9.53E+07	µg/kg	6.93E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.39E-04	mg/kg-d	4.00E-02	mg/kg-d	1.35E-02

TABLE B.7.2.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil (cont'd)	Surface Soil	On Site	Dermal	Iron	3.80E+07	µg/kg	2.76E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.15E-04	mg/kg-d	7.00E-01	mg/kg-d	3.07E-04
				Lead	3.51E+06	µg/kg	2.56E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.99E-05	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.84E+05	µg/kg	2.79E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.17E-06	mg/kg-d	9.60E-04	mg/kg-d	2.26E-03
				Nickel	2.67E+05	µg/kg	1.95E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.51E-06	mg/kg-d	2.00E-02	mg/kg-d	7.57E-05
				Vanadium	3.97E+04	µg/kg	2.89E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.25E-07	mg/kg-d	1.82E-04	mg/kg-d	1.23E-03
				Zinc	2.08E+06	µg/kg	1.51E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.18E-05	mg/kg-d	3.00E-01	mg/kg-d	3.93E-05
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	1.66E-08	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	3.33E-08	1.29E-07	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	8.45E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.69E-08	6.57E-08	mg/kg-d	2.00E-05	mg/kg-d	3.29E-03
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	5.64E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.13E-08	4.39E-08	mg/kg-d	--	mg/kg-d	NC
				Total TEQ	1.20E-02	µg/kg	8.73E-14	mg/kg-d	1.30E+05	(mg/kg-d)$^{-1}$	1.13E-08	6.79E-13	mg/kg-d	1.00E-09	mg/kg-d	6.79E-04
			Exp. Route Total								4.40E-07					3.10E-02
		Exposure Point Total									1.21E-05					2.51E+00
	Exposure Medium Total										1.21E-05					2.51E+00
	Ambient Air	On Site	Inhalation	Benzo(a)anthracene	3.13E+03	µg/kg	5.92E-11	mg/m^3	1.10E-01	(mg/m^3)$^{-1}$	6.51E-12	4.60E-10	mg/m^3	--	mg/m^3	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	3.02E-11	mg/m^3	1.10E+00	(mg/m^3)$^{-1}$	3.32E-11	2.35E-10	mg/m^3	--	mg/m^3	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	5.92E-08	mg/m^3	1.10E-01	(mg/m^3)$^{-1}$	6.52E-09	4.61E-07	mg/m^3	--	mg/m^3	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	2.70E-11	mg/m^3	1.10E-01	(mg/m^3)$^{-1}$	2.97E-12	2.10E-10	mg/m^3	--	mg/m^3	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	8.66E-12	mg/m^3	1.20E+00	(mg/m^3)$^{-1}$	1.04E-11	6.73E-11	mg/m^3	--	mg/m^3	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	2.50E-11	mg/m^3	1.10E-01	(mg/m^3)$^{-1}$	2.75E-12	1.95E-10	mg/m^3	--	mg/m^3	NC
				Aluminum	7.32E+06	µg/kg	1.38E-07	mg/m^3	--	(mg/m^3)$^{-1}$	NC	1.08E-06	mg/m^3	5.00E-03	mg/m^3	2.15E-04
				Antimony	3.91E+04	µg/kg	7.39E-10	mg/m^3	--	(mg/m^3)$^{-1}$	NC	5.75E-09	mg/m^3	--	mg/m^3	NC
				Arsenic	5.13E+04	µg/kg	9.71E-10	mg/m^3	4.30E+00	(mg/m^3)$^{-1}$	4.17E-09	7.55E-09	mg/m^3	1.50E-05	mg/m^3	5.03E-04
				Barium	6.60E+06	µg/kg	1.25E-07	mg/m^3	--	(mg/m^3)$^{-1}$	NC	9.71E-07	mg/m^3	5.00E-04	mg/m^3	1.94E-03
				Cadmium	7.72E+03	µg/kg	1.46E-10	mg/m^3	1.80E+00	(mg/m^3)$^{-1}$	2.63E-10	1.14E-09	mg/m^3	1.00E-05	mg/m^3	1.14E-04
				Cobalt	1.05E+04	µg/kg	1.99E-10	mg/m^3	--	(mg/m^3)$^{-1}$	NC	1.54E-09	mg/m^3	6.00E-06	mg/m^3	2.57E-04
				Copper	9.53E+07	µg/kg	1.80E-06	mg/m^3	--	(mg/m^3)$^{-1}$	NC	1.40E-05	mg/m^3	--	mg/m^3	NC
				Iron	3.80E+07	µg/kg	7.18E-07	mg/m^3	--	(mg/m^3)$^{-1}$	NC	5.59E-06	mg/m^3	--	mg/m^3	NC
				Lead	3.51E+06	µg/kg	6.64E-08	mg/m^3	--	(mg/m^3)$^{-1}$	NC	5.17E-07	mg/m^3	--	mg/m^3	NC
				Manganese	3.84E+05	µg/kg	7.26E-09	mg/m^3	--	(mg/m^3)$^{-1}$	NC	5.64E-08	mg/m^3	5.00E-05	mg/m^3	1.13E-03
				Nickel	2.67E+05	µg/kg	5.06E-09	mg/m^3	2.60E-01	(mg/m^3)$^{-1}$	1.31E-09	3.93E-08	mg/m^3	9.00E-05	mg/m^3	4.37E-04
				Vanadium	3.97E+04	µg/kg	7.51E-10	mg/m^3	--	(mg/m^3)$^{-1}$	NC	5.84E-09	mg/m^3	--	mg/m^3	NC
				Zinc	2.08E+06	µg/kg	3.94E-08	mg/m^3	--	(mg/m^3)$^{-1}$	NC	3.06E-07	mg/m^3	--	mg/m^3	NC

TABLE B.7.2.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil (cont.'d)	Ambient Air	On Site	Inhalation	Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	3.09E-11	mg/m³	5.70E-01	(mg/m³)⁻¹	1.76E-11	2.40E-10	mg/m³	--	mg/m³	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	1.57E-11	mg/m³	5.70E-01	(mg/m³)⁻¹	8.95E-12	1.22E-10	mg/m³	--	mg/m³	NC
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	1.05E-11	mg/m³	5.70E-01	(mg/m³)⁻¹	5.97E-12	8.15E-11	mg/m³	--	mg/m³	NC
				Total TEQ	1.20E-02	µg/kg	2.27E-16	mg/m³	3.80E+04	(mg/m³)⁻¹	8.62E-12	1.76E-15	mg/m³	4.00E-08	mg/m³	4.41E-08
			Exp. Route Total								1.24E-08					4.60E-03
		Exposure Point Total									1.24E-08					4.60E-03
	Exposure Medium Total										1.24E-08					4.60E-03
Medium Total											1.21E-05					2.51E+00
Sediment	Sediment	On Site	Ingestion	Benzo(a)anthracene	1.50E+03	µg/kg	1.65E-07	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	1.21E-07	1.29E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	1.98E-07	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	1.45E-06	1.54E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	2.76E-07	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	2.01E-07	2.14E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	5.29E-08	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	3.86E-07	4.11E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	2.09E-07	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	1.53E-07	1.63E-06	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	1.39E-06	mg/kg-d	1.50E+00	(mg/kg-d)⁻¹	2.08E-06	1.08E-05	mg/kg-d	3.00E-04	mg/kg-d	3.60E-02
				Cobalt	6.70E+03	µg/kg	7.38E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	5.74E-06	mg/kg-d	3.00E-04	mg/kg-d	1.91E-02
				Iron	1.35E+07	µg/kg	1.49E-03	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.16E-02	mg/kg-d	7.00E-01	mg/kg-d	1.65E-02
				Manganese	5.45E+05	µg/kg	6.01E-05	mg/kg-d	--	(mg/kg-d)⁻¹	NC	4.67E-04	mg/kg-d	2.40E-02	mg/kg-d	1.95E-02
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	7.27E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	1.45E-07	5.66E-07	mg/kg-d	2.00E-05	mg/kg-d	2.83E-02
			Exp. Route Total								4.54E-06					1.19E-01
			Dermal	Benzo(a)anthracene	1.50E+03	µg/kg	1.42E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	1.04E-08	1.10E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	1.70E-08	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	1.24E-07	1.32E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	2.36E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	1.73E-08	1.84E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	4.54E-09	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	3.31E-08	3.53E-08	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	1.80E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	1.31E-08	1.40E-07	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	2.75E-08	mg/kg-d	1.50E+00	(mg/kg-d)⁻¹	4.12E-08	2.14E-07	mg/kg-d	3.00E-04	mg/kg-d	7.13E-04
				Cobalt	6.70E+03	µg/kg	4.87E-09	mg/kg-d	--	(mg/kg-d)⁻¹	NC	3.79E-08	mg/kg-d	3.00E-04	mg/kg-d	1.26E-04
				Iron	1.35E+07	µg/kg	9.82E-06	mg/kg-d	--	(mg/kg-d)⁻¹	NC	7.64E-05	mg/kg-d	7.00E-01	mg/kg-d	1.09E-04
				Manganese	5.45E+05	µg/kg	3.96E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	3.08E-06	mg/kg-d	9.60E-04	mg/kg-d	3.21E-03
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	6.72E-09	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	1.34E-08	5.23E-08	mg/kg-d	2.00E-05	mg/kg-d	2.61E-03
			Exp. Route Total								2.53E-07					6.77E-03
		Exposure Point Total									4.79E-06					1.26E-01
	Exposure Medium Total										4.79E-06					1.26E-01
Medium Total											4.79E-06					1.26E-01
							Total of Receptor Risks Across All Media				2.3E-05	Total of Receptor Hazards Across All Media				2.8E+00

Notes:
NC = Not Calculated

TABLE B.7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On-Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil Gas	Indoor Air	On Site	Inhalation	1,1-Dichloroethane	1.10E+00	µg/m³	9.00E-05	mg/m³	1.60E-03	(mg/m³)⁻¹	1.44E-07	2.52E-04	mg/m³	--	mg/m³	NC
				1,1-Dichloroethene	6.21E-02	µg/m³	5.06E-06	mg/m³	--	(mg/m³)⁻¹	NC	1.42E-05	mg/m³	2.00E-01	mg/m³	7.09E-05
				1,4-Dichlorobenzene	1.95E-03	µg/m³	1.59E-07	mg/m³	1.10E-02	(mg/m³)⁻¹	1.75E-09	4.45E-07	mg/m³	8.00E-01	mg/m³	5.56E-07
				Benzene	7.41E+00	µg/m³	6.04E-04	mg/m³	7.80E-03	(mg/m³)⁻¹	4.71E-06	1.69E-03	mg/m³	3.00E-02	mg/m³	5.64E-02
				Bromomethane	7.98E-03	µg/m³	6.50E-07	mg/m³	--	(mg/m³)⁻¹	NC	1.82E-06	mg/m³	5.00E-03	mg/m³	3.64E-04
				Chlorobenzene	6.37E+00	µg/m³	5.19E-04	mg/m³	--	(mg/m³)⁻¹	NC	1.45E-03	mg/m³	5.00E-02	mg/m³	2.91E-02
				Chloroethane	2.94E-01	µg/m³	2.39E-05	mg/m³	--	(mg/m³)⁻¹	NC	6.70E-05	mg/m³	1.00E+01	mg/m³	6.70E-06
				Chloroform	3.28E-02	µg/m³	2.68E-06	mg/m³	2.30E-02	(mg/m³)⁻¹	6.16E-08	7.50E-06	mg/m³	9.80E-02	mg/m³	7.65E-05
				cis-1,2-Dichloroethene	8.36E+00	µg/m³	6.82E-04	mg/m³	--	(mg/m³)⁻¹	NC	1.91E-03	mg/m³	--	mg/m³	NC
				Cyclohexane	2.62E+01	µg/m³	2.13E-03	mg/m³	--	(mg/m³)⁻¹	NC	5.98E-03	mg/m³	6.00E+00	mg/m³	9.96E-04
				Dichlorodifluoromethane	6.81E-01	µg/m³	5.55E-05	mg/m³	--	(mg/m³)⁻¹	NC	1.55E-04	mg/m³	2.00E-01	mg/m³	7.77E-04
				Ethylbenzene	2.40E+01	µg/m³	1.96E-03	mg/m³	2.50E-03	(mg/m³)⁻¹	4.89E-06	5.48E-03	mg/m³	1.00E+00	mg/m³	5.48E-03
				Isopropylbenzene	3.69E+00	µg/m³	3.01E-04	mg/m³	--	(mg/m³)⁻¹	NC	8.41E-04	mg/m³	4.00E-01	mg/m³	2.10E-03
				Methyl Tert Butyl Ether	3.99E-02	µg/m³	3.25E-06	mg/m³	2.60E-04	(mg/m³)⁻¹	8.46E-10	9.11E-06	mg/m³	3.00E+00	mg/m³	3.04E-06
				Methylene chloride	1.16E-02	µg/m³	9.44E-07	mg/m³	4.70E-04	(mg/m³)⁻¹	4.44E-10	2.64E-06	mg/m³	1.00E+00	mg/m³	2.64E-06
				Naphthalene	3.22E-01	µg/m³	2.63E-05	mg/m³	3.40E-02	(mg/m³)⁻¹	8.94E-07	7.36E-05	mg/m³	3.00E-03	mg/m³	2.45E-02
				Tetrachloroethene	1.17E-01	µg/m³	9.56E-06	mg/m³	5.90E-03	(mg/m³)⁻¹	5.64E-08	2.68E-05	mg/m³	2.70E-01	mg/m³	9.92E-05
				Toluene	1.53E+00	µg/m³	1.24E-04	mg/m³	--	(mg/m³)⁻¹	NC	3.48E-04	mg/m³	5.00E+00	mg/m³	6.96E-05
				trans-1,2-Dichloroethene	2.04E-01	µg/m³	1.66E-05	mg/m³	--	(mg/m³)⁻¹	NC	4.65E-05	mg/m³	6.00E-02	mg/m³	7.76E-04
				Trichloroethene	2.86E+01	µg/m³	2.33E-03	mg/m³	2.00E-03	(mg/m³)⁻¹	4.66E-06	6.52E-03	mg/m³	--	mg/m³	NC
				Trichlorofluoromethane	1.91E-02	µg/m³	1.56E-06	mg/m³	--	(mg/m³)⁻¹	NC	4.36E-06	mg/m³	7.00E-01	mg/m³	6.23E-06
				Vinyl chloride	2.93E+00	µg/m³	2.39E-04	mg/m³	4.40E-03	(mg/m³)⁻¹	1.05E-06	6.70E-04	mg/m³	1.00E-01	mg/m³	6.70E-03
				Xylenes (total)	2.44E+01	µg/m³	1.99E-03	mg/m³	--	(mg/m³)⁻¹	NC	5.58E-03	mg/m³	1.00E-01	mg/m³	5.58E-02
			Exp. Route Total								1.65E-05					1.83E-01
		Exposure Point Total									1.65E-05					1.83E-01
	Exposure Medium Total										1.65E-05					1.83E-01
Medium Total											1.65E-05					1.83E-01
Soil Gas	Ambient Air	On Site	Inhalation	Benzene	1.31E+00	µg/m³	1.06E-04	mg/m³	7.80E-03	(mg/m³)⁻¹	8.30E-07	2.98E-04	mg/m³	3.00E-02	mg/m³	9.94E-03
				Ethylbenzene	3.80E+00	µg/m³	3.10E-04	mg/m³	2.50E-03	(mg/m³)⁻¹	7.75E-07	8.69E-04	mg/m³	1.00E+00	mg/m³	8.69E-04
				Naphthalene	4.41E-02	µg/m³	3.60E-06	mg/m³	3.40E-02	(mg/m³)⁻¹	1.22E-07	1.01E-05	mg/m³	3.00E-03	mg/m³	3.36E-03
				Trichloroethene	4.68E+00	µg/m³	3.82E-04	mg/m³	2.00E-03	(mg/m³)⁻¹	7.64E-07	1.07E-03	mg/m³	--	mg/m³	NC
				Vinyl chloride	5.88E-01	µg/m³	4.79E-05	mg/m³	4.40E-03	(mg/m³)⁻¹	2.11E-07	1.34E-04	mg/m³	1.00E-01	mg/m³	1.34E-03
			Exp. Route Total								2.70E-06					1.55E-02
		Exposure Point Total									2.70E-06					1.55E-02
	Exposure Medium Total										2.70E-06					1.55E-02
Medium Total											2.70E-06					1.55E-02

TABLE B.7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On-Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	On Site	Ingestion	Benzo(a)anthracene	3.13E+03	µg/kg	1.09E-06	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	7.98E-07	3.06E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	5.58E-07	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	4.08E-06	1.56E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	1.29E-06	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	9.41E-07	3.61E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	4.99E-07	mg/kg-d	7.30E-02	(mg/kg-d)$^{-1}$	3.65E-08	1.40E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	1.60E-07	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.17E-06	4.48E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	4.63E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	3.38E-07	1.30E-06	mg/kg-d	--	mg/kg-d	NC
				Aluminum	7.32E+06	µg/kg	2.56E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	7.17E-03	mg/kg-d	1.00E+00	mg/kg-d	7.17E-03
				Antimony	3.91E+04	µg/kg	1.37E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.82E-05	mg/kg-d	4.00E-04	mg/kg-d	9.56E-02
				Arsenic	5.13E+04	µg/kg	1.79E-05	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	2.69E-05	5.02E-05	mg/kg-d	3.00E-04	mg/kg-d	1.67E-01
				Barium	6.60E+06	µg/kg	2.31E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.46E-03	mg/kg-d	2.00E-01	mg/kg-d	3.23E-02
				Cadmium	7.72E+03	µg/kg	2.70E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	7.56E-06	mg/kg-d	5.00E-04	mg/kg-d	1.51E-02
				Cobalt	1.05E+04	µg/kg	3.67E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.03E-05	mg/kg-d	3.00E-04	mg/kg-d	3.43E-02
				Copper	9.53E+07	µg/kg	3.33E-02	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	9.33E-02	mg/kg-d	4.00E-02	mg/kg-d	2.33E+00
				Iron	3.80E+07	µg/kg	1.33E-02	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.72E-02	mg/kg-d	7.00E-01	mg/kg-d	5.31E-02
				Lead	3.51E+06	µg/kg	1.23E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.44E-03	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.84E+05	µg/kg	1.34E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.76E-04	mg/kg-d	2.40E-02	mg/kg-d	1.56E-02
				Nickel	2.67E+05	µg/kg	9.35E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.62E-04	mg/kg-d	2.00E-02	mg/kg-d	1.31E-02
				Vanadium	3.97E+04	µg/kg	1.39E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.88E-05	mg/kg-d	7.00E-03	mg/kg-d	5.55E-03
				Zinc	2.08E+06	µg/kg	7.27E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.04E-03	mg/kg-d	3.00E-01	mg/kg-d	6.79E-03
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	5.71E-07	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.14E-06	1.60E-06	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	2.90E-07	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	5.80E-07	8.12E-07	mg/kg-d	2.00E-05	mg/kg-d	4.06E-02
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	1.94E-07	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	3.87E-07	5.42E-07	mg/kg-d	--	mg/kg-d	NC
				Total TEQ	1.20E-02	µg/kg	4.19E-12	mg/kg-d	1.30E+05	(mg/kg-d)$^{-1}$	5.45E-07	1.17E-11	mg/kg-d	1.00E-09	mg/kg-d	1.17E-02
			Exp. Route Total								3.69E-05					2.83E+00
			Dermal	Benzo(a)anthracene	3.13E+03	µg/kg	9.38E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	6.85E-07	2.63E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	4.79E-07	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	3.50E-06	1.34E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	1.11E-06	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	8.07E-07	3.10E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	4.28E-07	mg/kg-d	7.30E-02	(mg/kg-d)$^{-1}$	3.13E-08	1.20E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	1.37E-07	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.00E-06	3.84E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	3.97E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.90E-07	1.11E-06	mg/kg-d	--	mg/kg-d	NC
				Aluminum	7.32E+06	µg/kg	1.69E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.73E-04	mg/kg-d	1.00E+00	mg/kg-d	4.73E-04
				Antimony	3.91E+04	µg/kg	9.01E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.52E-06	mg/kg-d	6.00E-05	mg/kg-d	4.21E-02
				Arsenic	5.13E+04	µg/kg	3.55E-06	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	5.33E-06	9.94E-06	mg/kg-d	3.00E-04	mg/kg-d	3.31E-02
				Barium	6.60E+06	µg/kg	1.52E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.27E-04	mg/kg-d	1.40E-02	mg/kg-d	3.05E-02
				Cadmium	7.72E+03	µg/kg	1.78E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.99E-08	mg/kg-d	2.50E-05	mg/kg-d	1.99E-03
				Cobalt	1.05E+04	µg/kg	2.42E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.78E-07	mg/kg-d	3.00E-04	mg/kg-d	2.26E-03
				Copper	9.53E+07	µg/kg	2.20E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.16E-03	mg/kg-d	4.00E-02	mg/kg-d	1.54E-01

TABLE B.7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On-Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil (cont.'d)	Surface Soil	On Site	Dermal	Iron	3.80E+07	µg/kg	8.76E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.45E-03	mg/kg-d	7.00E-01	mg/kg-d	3.50E-03
				Lead	3.51E+06	µg/kg	8.11E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.27E-04	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.84E+05	µg/kg	8.85E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.48E-05	mg/kg-d	9.60E-04	mg/kg-d	2.58E-02
				Nickel	2.67E+05	µg/kg	6.17E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.73E-05	mg/kg-d	2.00E-02	mg/kg-d	8.64E-04
				Vanadium	3.97E+04	µg/kg	9.16E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.56E-06	mg/kg-d	1.82E-04	mg/kg-d	1.41E-02
				Zinc	2.08E+06	µg/kg	4.80E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.34E-04	mg/kg-d	3.00E-01	mg/kg-d	4.48E-04
				Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	5.27E-07	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.05E-06	1.48E-06	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	2.68E-07	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	5.36E-07	7.50E-07	mg/kg-d	2.00E-05	mg/kg-d	3.75E-02
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	1.79E-07	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	3.58E-07	5.01E-07	mg/kg-d	--	mg/kg-d	NC
				Total TEQ	1.20E-02	µg/kg	2.77E-12	mg/kg-d	1.30E+05	(mg/kg-d)$^{-1}$	3.60E-07	7.75E-12	mg/kg-d	1.00E-09	mg/kg-d	7.75E-03
			Exp. Route Total								1.39E-05					3.54E-01
		Exposure Point Total									5.09E-05					3.18E+00
	Exposure Medium Total										5.09E-05					3.18E+00
	Ambient Air	On Site	Inhalation	Benzo(a)anthracene	3.13E+03	µg/kg	1.88E-10	mg/m^3	1.10E-01	(mg/m^3)$^{-1}$	2.06E-11	5.25E-10	mg/m^3	--	mg/m^3	NC
				Benzo(a)pyrene	1.60E+03	µg/kg	9.58E-11	mg/m^3	1.10E+00	(mg/m^3)$^{-1}$	1.05E-10	2.68E-10	mg/m^3	--	mg/m^3	NC
				Benzo(b)fluoranthene	3.69E+03	µg/kg	1.88E-07	mg/m^3	1.10E-01	(mg/m^3)$^{-1}$	2.07E-08	5.26E-07	mg/m^3	--	mg/m^3	NC
				Benzo(k)fluoranthene	1.43E+03	µg/kg	8.57E-11	mg/m^3	1.10E-01	(mg/m^3)$^{-1}$	9.43E-12	2.40E-10	mg/m^3	--	mg/m^3	NC
				Dibenz(a,h)anthracene	4.58E+02	µg/kg	2.75E-11	mg/m^3	1.20E+00	(mg/m^3)$^{-1}$	3.29E-11	7.69E-11	mg/m^3	--	mg/m^3	NC
				Indeno(1,2,3-cd) pyrene	1.32E+03	µg/kg	7.94E-11	mg/m^3	1.10E-01	(mg/m^3)$^{-1}$	8.73E-12	2.22E-10	mg/m^3	--	mg/m^3	NC
				Aluminum	7.32E+06	µg/kg	4.39E-07	mg/m^3	--	(mg/m^3)$^{-1}$	NC	1.23E-06	mg/m^3	5.00E-03	mg/m^3	2.46E-04
				Antimony	3.91E+04	µg/kg	2.34E-09	mg/m^3	--	(mg/m^3)$^{-1}$	NC	6.56E-09	mg/m^3	--	mg/m^3	NC
				Arsenic	5.13E+04	µg/kg	3.08E-09	mg/m^3	4.30E+00	(mg/m^3)$^{-1}$	1.32E-08	8.62E-09	mg/m^3	1.50E-05	mg/m^3	5.74E-04
				Barium	6.60E+06	µg/kg	3.96E-07	mg/m^3	--	(mg/m^3)$^{-1}$	NC	1.11E-06	mg/m^3	5.00E-04	mg/m^3	2.22E-03
				Cadmium	7.72E+03	µg/kg	4.63E-10	mg/m^3	1.80E+00	(mg/m^3)$^{-1}$	8.33E-10	1.30E-09	mg/m^3	1.00E-05	mg/m^3	1.30E-04
				Cobalt	1.05E+04	µg/kg	6.30E-10	mg/m^3	--	(mg/m^3)$^{-1}$	NC	1.76E-09	mg/m^3	6.00E-06	mg/m^3	2.94E-04
				Copper	9.53E+07	µg/kg	5.72E-06	mg/m^3	--	(mg/m^3)$^{-1}$	NC	1.60E-05	mg/m^3	--	mg/m^3	NC
				Iron	3.80E+07	µg/kg	2.28E-06	mg/m^3	--	(mg/m^3)$^{-1}$	NC	6.38E-06	mg/m^3	--	mg/m^3	NC
				Lead	3.51E+06	µg/kg	2.11E-07	mg/m^3	--	(mg/m^3)$^{-1}$	NC	5.90E-07	mg/m^3	--	mg/m^3	NC
				Manganese	3.84E+05	µg/kg	2.30E-08	mg/m^3	--	(mg/m^3)$^{-1}$	NC	6.44E-08	mg/m^3	5.00E-05	mg/m^3	1.29E-03
				Nickel	2.67E+05	µg/kg	1.60E-08	mg/m^3	2.60E-01	(mg/m^3)$^{-1}$	4.17E-09	4.49E-08	mg/m^3	9.00E-05	mg/m^3	4.99E-04
				Vanadium	3.97E+04	µg/kg	2.38E-09	mg/m^3	--	(mg/m^3)$^{-1}$	NC	6.66E-09	mg/m^3	--	mg/m^3	NC
				Zinc	2.08E+06	µg/kg	1.25E-07	mg/m^3	--	(mg/m^3)$^{-1}$	NC	3.49E-07	mg/m^3	--	mg/m^3	NC

TABLE B.7.2.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On-Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil (cont.'d)	Ambient Air	On Site	Inhalation	Aroclor-1248 (PCB-1248)	1.63E+03	µg/kg	9.79E-11	mg/m^3	5.70E-01	(mg/m^3)$^{-1}$	5.58E-11	2.74E-10	mg/m^3	--	mg/m^3	NC
				Aroclor-1254 (PCB-1254)	8.30E+02	µg/kg	4.98E-11	mg/m^3	5.70E-01	(mg/m^3)$^{-1}$	2.84E-11	1.39E-10	mg/m^3	--	mg/m^3	NC
				Aroclor-1260 (PCB-1260)	5.54E+02	µg/kg	3.32E-11	mg/m^3	5.70E-01	(mg/m^3)$^{-1}$	1.89E-11	9.30E-11	mg/m^3	--	mg/m^3	NC
				Total TEQ	1.20E-02	µg/kg	7.19E-16	mg/m^3	3.80E+04	(mg/m^3)$^{-1}$	2.73E-11	2.01E-15	mg/m^3	4.00E-08	mg/m^3	5.04E-08
			Exp. Route Total								3.92E-08					5.25E-03
		Exposure Point Total									3.92E-08					5.25E-03
	Exposure Medium Total										3.92E-08					5.25E-03
Medium Total											5.09E-05					3.19E+00
Sediment	Sediment	On Site	Ingestion	Benzo(a)anthracene	1.50E+03	µg/kg	5.24E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	3.83E-07	1.47E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	6.29E-07	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	4.59E-06	1.76E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	8.74E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	6.38E-07	2.45E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	1.68E-07	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.22E-06	4.70E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	6.64E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	4.85E-07	1.86E-06	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	4.40E-06	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	6.60E-06	1.23E-05	mg/kg-d	3.00E-04	mg/kg-d	4.11E-02
				Cobalt	6.70E+03	µg/kg	2.34E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.56E-06	mg/kg-d	3.00E-04	mg/kg-d	2.19E-02
				Iron	1.35E+07	µg/kg	4.72E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.32E-02	mg/kg-d	7.00E-01	mg/kg-d	1.89E-02
				Manganese	5.45E+05	µg/kg	1.90E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.33E-04	mg/kg-d	2.40E-02	mg/kg-d	2.22E-02
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	2.31E-07	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	4.61E-07	6.46E-07	mg/kg-d	2.00E-05	mg/kg-d	3.23E-02
			Exp. Route Total								1.44E-05					1.36E-01
			Dermal	Benzo(a)anthracene	1.50E+03	µg/kg	4.50E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	3.28E-07	1.26E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	5.40E-07	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	3.94E-06	1.51E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	7.50E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	5.47E-07	2.10E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	1.44E-07	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.05E-06	4.03E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	5.70E-07	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	4.16E-07	1.60E-06	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	8.72E-07	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	1.31E-06	2.44E-06	mg/kg-d	3.00E-04	mg/kg-d	8.14E-03
				Cobalt	6.70E+03	µg/kg	1.55E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.33E-07	mg/kg-d	3.00E-04	mg/kg-d	1.44E-03
				Iron	1.35E+07	µg/kg	3.11E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	8.72E-04	mg/kg-d	7.00E-01	mg/kg-d	1.25E-03
				Manganese	5.45E+05	µg/kg	1.26E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.52E-05	mg/kg-d	9.60E-04	mg/kg-d	3.67E-02
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	2.13E-07	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	4.26E-07	5.97E-07	mg/kg-d	2.00E-05	mg/kg-d	2.98E-02
			Exp. Route Total								8.02E-06					7.73E-02
		Exposure Point Total									2.24E-05					2.14E-01
	Exposure Medium Total										2.24E-05					2.14E-01
Medium Total											2.24E-05					2.14E-01
							Total of Receptor Risks Across All Media				9.2E-05	Total of Receptor Hazards Across All Media				3.6E+00

Notes:
NC = Not Calculated

TABLE B.7.3.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil Gas	Ambient Air	On Site	Inhalation	Benzene	7.25E-03	µg/m³	5.68E-09	mg/m³	7.80E-03	(mg/m³)⁻¹	4.43E-11	3.97E-07	mg/m³	3.00E-02	mg/m³	1.32E-05
				Ethylbenzene	2.11E-02	µg/m³	1.65E-08	mg/m³	2.50E-03	(mg/m³)⁻¹	4.14E-11	1.16E-06	mg/m³	1.00E+00	mg/m³	1.16E-06
				Naphthalene	2.45E-04	µg/m³	1.92E-10	mg/m³	3.40E-02	(mg/m³)⁻¹	6.53E-12	1.34E-08	mg/m³	3.00E-03	mg/m³	4.48E-06
				Trichloroethene	2.60E-02	µg/m³	2.04E-08	mg/m³	2.00E-03	(mg/m³)⁻¹	4.07E-11	1.43E-06	mg/m³	--	mg/m³	NC
				Vinyl chloride	3.27E-03	µg/m³	2.56E-09	mg/m³	4.40E-03	(mg/m³)⁻¹	1.13E-11	1.79E-07	mg/m³	1.00E-01	mg/m³	1.79E-06
			Exp. Route Total								1.44E-10					2.07E-05
		Exposure Point Total									1.44E-10					2.07E-05
	Exposure Medium Total										1.44E-10					2.07E-05
Medium Total											1.44E-10					2.07E-05
Surface and Subsurface Soil	Soil	On Site	Ingestion	Benzene	5.27E+02	µg/kg	5.83E-09	mg/kg-d	5.50E-02	(mg/kg-d)⁻¹	3.21E-10	4.08E-07	mg/kg-d	4.00E-03	mg/kg-d	1.02E-04
				Ethylbenzene	8.62E+03	µg/kg	9.54E-08	mg/kg-d	1.10E-02	(mg/kg-d)⁻¹	1.05E-09	6.68E-06	mg/kg-d	1.00E-01	mg/kg-d	6.68E-05
				Tetrachloroethene	1.90E+02	µg/kg	2.10E-09	mg/kg-d	5.40E-01	(mg/kg-d)⁻¹	1.14E-09	1.47E-07	mg/kg-d	1.00E-02	mg/kg-d	1.47E-05
				Vinyl chloride	1.32E+02	µg/kg	1.46E-09	mg/kg-d	7.20E-01	(mg/kg-d)⁻¹	1.05E-09	1.02E-07	mg/kg-d	3.00E-03	mg/kg-d	3.40E-05
				Xylenes (total)	4.72E+04	µg/kg	5.23E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	3.66E-05	mg/kg-d	2.00E-01	mg/kg-d	1.83E-04
				Benzo(a)anthracene	1.93E+03	µg/kg	2.14E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	1.56E-08	1.50E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.44E+03	µg/kg	1.59E-08	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	1.16E-07	1.12E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.23E+03	µg/kg	2.47E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	1.80E-08	1.73E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.16E+03	µg/kg	1.29E-08	mg/kg-d	7.30E-02	(mg/kg-d)⁻¹	9.39E-10	9.00E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	1.60E+02	µg/kg	1.78E-09	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	1.30E-08	1.24E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	5.97E+02	µg/kg	6.61E-09	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	4.82E-09	4.62E-07	mg/kg-d	--	mg/kg-d	NC
				Naphthalene	1.54E+03	µg/kg	1.70E-08	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.19E-06	mg/kg-d	2.00E-02	mg/kg-d	5.96E-05
				Aluminum	6.71E+06	µg/kg	7.43E-05	mg/kg-d	--	(mg/kg-d)⁻¹	NC	5.20E-03	mg/kg-d	1.00E+00	mg/kg-d	5.20E-03
				Antimony	8.45E+04	µg/kg	9.35E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	6.54E-05	mg/kg-d	4.00E-04	mg/kg-d	1.64E-01
				Arsenic	2.22E+04	µg/kg	2.46E-07	mg/kg-d	1.50E+00	(mg/kg-d)⁻¹	3.68E-07	1.72E-05	mg/kg-d	3.00E-04	mg/kg-d	5.73E-02
				Barium	7.84E+05	µg/kg	8.68E-06	mg/kg-d	--	(mg/kg-d)⁻¹	NC	6.08E-04	mg/kg-d	2.00E-01	mg/kg-d	3.04E-03
				Cadmium	1.14E+04	µg/kg	1.26E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	8.85E-06	mg/kg-d	5.00E-04	mg/kg-d	1.77E-02
				Cobalt	2.83E+04	µg/kg	3.13E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	2.19E-05	mg/kg-d	3.00E-04	mg/kg-d	7.30E-02
				Copper	2.97E+07	µg/kg	3.28E-04	mg/kg-d	--	(mg/kg-d)⁻¹	NC	2.30E-02	mg/kg-d	4.00E-02	mg/kg-d	5.75E-01
				Iron	4.53E+07	µg/kg	5.01E-04	mg/kg-d	--	(mg/kg-d)⁻¹	NC	3.51E-02	mg/kg-d	7.00E-01	mg/kg-d	5.01E-02
				Lead	4.53E+06	µg/kg	5.02E-05	mg/kg-d	--	(mg/kg-d)⁻¹	NC	3.51E-03	mg/kg-d	--	mg/kg-d	NC
				Manganese	5.08E+05	µg/kg	5.62E-06	mg/kg-d	--	(mg/kg-d)⁻¹	NC	3.94E-04	mg/kg-d	2.40E-02	mg/kg-d	1.64E-02
				Mercury	1.26E+03	µg/kg	1.39E-08	mg/kg-d	--	(mg/kg-d)⁻¹	NC	9.76E-07	mg/kg-d	1.60E-04	mg/kg-d	6.10E-03
				Nickel	1.25E+05	µg/kg	1.38E-06	mg/kg-d	--	(mg/kg-d)⁻¹	NC	9.69E-05	mg/kg-d	2.00E-02	mg/kg-d	4.84E-03
				Vanadium	2.73E+04	µg/kg	3.02E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	2.11E-05	mg/kg-d	7.00E-03	mg/kg-d	3.02E-03
				Zinc	3.72E+06	µg/kg	4.12E-05	mg/kg-d	--	(mg/kg-d)⁻¹	NC	2.88E-03	mg/kg-d	3.00E-01	mg/kg-d	9.62E-03
				Aroclor-1248 (PCB-1248)	4.91E+02	µg/kg	5.43E-09	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	1.09E-08	3.80E-07	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	1.81E+03	µg/kg	2.00E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	4.00E-08	1.40E-06	mg/kg-d	2.00E-05	mg/kg-d	7.01E-02
				Aroclor-1260 (PCB-1260)	2.30E+02	µg/kg	2.55E-09	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	5.09E-09	1.78E-07	mg/kg-d	--	mg/kg-d	NC
				Dieldrin	3.15E+01	µg/kg	3.48E-10	mg/kg-d	1.60E+01	(mg/kg-d)⁻¹	5.57E-09	2.44E-08	mg/kg-d	5.00E-05	mg/kg-d	4.88E-04
				Total TEQ	1.20E-02	µg/kg	1.33E-13	mg/kg-d	1.30E+05	(mg/kg-d)⁻¹	1.73E-08	9.30E-12	mg/kg-d	1.00E-09	mg/kg-d	9.30E-03
			Exp. Route Total								6.19E-07					1.06E+00

TABLE B.7.3.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface and Subsurface Soil	Soil	On Site	Dermal	Benzene	5.27E+02	µg/kg	2.92E-12	mg/kg-d	5.50E-02	(mg/kg-d)$^{-1}$	1.60E-13	2.04E-10	mg/kg-d	4.00E-03	mg/kg-d	5.10E-08
				Ethylbenzene	8.62E+03	µg/kg	2.86E-09	mg/kg-d	1.10E-02	(mg/kg-d)$^{-1}$	3.15E-11	2.00E-07	mg/kg-d	1.00E-01	mg/kg-d	2.00E-06
				Tetrachloroethene	1.90E+02	µg/kg	6.31E-11	mg/kg-d	5.40E-01	(mg/kg-d)$^{-1}$	3.41E-11	4.41E-09	mg/kg-d	1.00E-02	mg/kg-d	4.41E-07
				Vinyl chloride	1.32E+02	µg/kg	7.29E-13	mg/kg-d	7.20E-01	(mg/kg-d)$^{-1}$	5.25E-13	5.10E-11	mg/kg-d	3.00E-03	mg/kg-d	1.70E-08
				Xylenes (total)	4.72E+04	µg/kg	1.57E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.10E-06	mg/kg-d	2.00E-01	mg/kg-d	5.49E-06
				Benzo(a)anthracene	1.93E+03	µg/kg	2.78E-09	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.03E-09	1.95E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.44E+03	µg/kg	2.07E-09	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.51E-08	1.45E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.23E+03	µg/kg	3.21E-09	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.34E-09	2.24E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.16E+03	µg/kg	1.67E-09	mg/kg-d	7.30E-02	(mg/kg-d)$^{-1}$	1.22E-10	1.17E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	1.60E+02	µg/kg	2.31E-10	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.69E-09	1.62E-08	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	5.97E+02	µg/kg	8.59E-10	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	6.27E-10	6.01E-08	mg/kg-d	--	mg/kg-d	NC
				Naphthalene	1.54E+03	µg/kg	2.21E-09	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.55E-07	mg/kg-d	2.00E-02	mg/kg-d	7.75E-06
				Aluminum	6.71E+06	µg/kg	7.43E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.20E-05	mg/kg-d	1.00E+00	mg/kg-d	5.20E-05
				Antimony	8.45E+04	µg/kg	9.35E-09	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.54E-07	mg/kg-d	6.00E-05	mg/kg-d	1.09E-02
				Arsenic	2.22E+04	µg/kg	7.37E-09	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	1.11E-08	5.16E-07	mg/kg-d	3.00E-04	mg/kg-d	1.72E-03
				Barium	7.84E+05	µg/kg	8.68E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.08E-06	mg/kg-d	1.40E-02	mg/kg-d	4.34E-04
				Cadmium	1.14E+04	µg/kg	1.26E-10	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	8.85E-09	mg/kg-d	2.50E-05	mg/kg-d	3.54E-04
				Cobalt	2.83E+04	µg/kg	3.13E-09	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.19E-07	mg/kg-d	3.00E-04	mg/kg-d	7.30E-04
				Copper	2.97E+07	µg/kg	3.28E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.30E-04	mg/kg-d	4.00E-02	mg/kg-d	5.75E-03
				Iron	4.53E+07	µg/kg	5.01E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.51E-04	mg/kg-d	7.00E-01	mg/kg-d	5.01E-04
				Lead	4.53E+06	µg/kg	5.02E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.51E-05	mg/kg-d	--	mg/kg-d	NC
				Manganese	5.08E+05	µg/kg	5.62E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.94E-06	mg/kg-d	9.60E-04	mg/kg-d	4.10E-03
				Mercury	1.26E+03	µg/kg	1.39E-10	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	9.76E-09	mg/kg-d	1.60E-04	mg/kg-d	6.10E-05
				Nickel	1.25E+05	µg/kg	1.38E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	9.69E-07	mg/kg-d	2.00E-02	mg/kg-d	4.84E-05
				Vanadium	2.73E+04	µg/kg	3.02E-09	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.11E-07	mg/kg-d	1.82E-04	mg/kg-d	1.16E-03
				Zinc	3.72E+06	µg/kg	4.12E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.88E-05	mg/kg-d	3.00E-01	mg/kg-d	9.62E-05
				Aroclor-1248 (PCB-1248)	4.91E+02	µg/kg	7.61E-10	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.52E-09	5.33E-08	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	1.81E+03	µg/kg	2.80E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	5.60E-09	1.96E-07	mg/kg-d	2.00E-05	mg/kg-d	9.81E-03
				Aroclor-1260 (PCB-1260)	2.30E+02	µg/kg	3.57E-10	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	7.13E-10	2.50E-08	mg/kg-d	--	mg/kg-d	NC
				Dieldrin	3.15E+01	µg/kg	3.48E-11	mg/kg-d	1.60E+01	(mg/kg-d)$^{-1}$	5.57E-10	2.44E-09	mg/kg-d	5.00E-05	mg/kg-d	4.88E-05
				Total TEQ	1.20E-02	µg/kg	1.33E-14	mg/kg-d	1.30E+05	(mg/kg-d)$^{-1}$	1.73E-09	9.30E-13	mg/kg-d	1.00E-09	mg/kg-d	9.30E-04
			Exp. Route Total								4.32E-08					3.67E-02
		Exposure Point Total									6.63E-07					1.10E+00
	Exposure Medium Total										6.63E-07					1.10E+00

TABLE B.7.3.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface and Subsurface Soil (1)	Ambient Air	On Site	Inhalation	Benzene	NA	µg/kg	NC	mg/m³	7.80E-03	(mg/m³)⁻¹	NC	NC	mg/m³	3.00E-02	mg/m³	NC
				Ethylbenzene	NA	µg/kg	NC	mg/m³	2.50E-03	(mg/m³)⁻¹	NC	NC	mg/m³	1.00E+00	mg/m³	NC
				Tetrachloroethene	NA	µg/kg	NC	mg/m³	5.90E-03	(mg/m³)⁻¹	NC	NC	mg/m³	4.00E-01	mg/m³	NC
				Vinyl chloride	NA	µg/kg	NC	mg/m³	4.40E-03	(mg/m³)⁻¹	NC	NC	mg/m³	2.70E-01	mg/m³	NC
				Xylenes (total)	NA	µg/kg	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	1.00E-01	mg/m³	NC
				Benzo(a)anthracene	1.93E+03	µg/kg	1.64E-10	mg/m³	1.10E-01	(mg/m³)⁻¹	1.80E-11	1.15E-08	mg/m³	1.00E-01	mg/m³	1.15E-07
				Benzo(a)pyrene	1.44E+03	µg/kg	1.22E-10	mg/m³	1.10E+00	(mg/m³)⁻¹	1.34E-10	8.55E-09	mg/m³	--	mg/m³	NC
				Benzo(b)fluoranthene	2.23E+03	µg/kg	6.33E-09	mg/m³	1.10E-01	(mg/m³)⁻¹	6.96E-10	4.43E-07	mg/m³	--	mg/m³	NC
				Benzo(k)fluoranthene	1.16E+03	µg/kg	9.85E-11	mg/m³	1.10E-01	(mg/m³)⁻¹	1.08E-11	6.90E-09	mg/m³	--	mg/m³	NC
				Dibenz(a,h)anthracene	1.60E+02	µg/kg	1.36E-11	mg/m³	1.20E+00	(mg/m³)⁻¹	1.63E-11	9.52E-10	mg/m³	--	mg/m³	NC
				Indeno(1,2,3-cd) pyrene	5.97E+02	µg/kg	5.06E-11	mg/m³	1.10E-01	(mg/m³)⁻¹	5.57E-12	3.54E-09	mg/m³	--	mg/m³	NC
				Naphthalene	NA	µg/kg	NC	mg/m³	3.40E-02	(mg/m³)⁻¹	NC	NC	mg/m³	3.00E-03	mg/m³	NC
				Aluminum	6.71E+06	µg/kg	5.69E-07	mg/m³	--	(mg/m³)⁻¹	NC	3.98E-05	mg/m³	5.00E-03	mg/m³	7.96E-03
				Antimony	8.45E+04	µg/kg	7.16E-09	mg/m³	--	(mg/m³)⁻¹	NC	5.01E-07	mg/m³	--	mg/m³	NC
				Arsenic	2.22E+04	µg/kg	1.88E-09	mg/m³	4.30E+00	(mg/m³)⁻¹	8.09E-09	1.32E-07	mg/m³	1.50E-05	mg/m³	8.78E-03
				Barium	7.84E+05	µg/kg	6.65E-08	mg/m³	--	(mg/m³)⁻¹	NC	4.66E-06	mg/m³	5.00E-04	mg/m³	9.31E-03
				Cadmium	1.14E+04	µg/kg	9.68E-10	mg/m³	1.80E+00	(mg/m³)⁻¹	1.74E-09	6.78E-08	mg/m³	1.00E-05	mg/m³	6.78E-03
				Cobalt	2.83E+04	µg/kg	2.40E-09	mg/m³	--	(mg/m³)⁻¹	NC	1.68E-07	mg/m³	6.00E-06	mg/m³	2.80E-02
				Copper	2.97E+07	µg/kg	2.51E-06	mg/m³	--	(mg/m³)⁻¹	NC	1.76E-04	mg/m³	--	mg/m³	NC
				Iron	4.53E+07	µg/kg	3.84E-06	mg/m³	--	(mg/m³)⁻¹	NC	2.69E-04	mg/m³	--	mg/m³	NC
				Lead	4.53E+06	µg/kg	3.84E-07	mg/m³	--	(mg/m³)⁻¹	NC	2.69E-05	mg/m³	--	mg/m³	NC
				Manganese	5.08E+05	µg/kg	4.31E-08	mg/m³	--	(mg/m³)⁻¹	NC	3.01E-06	mg/m³	5.00E-05	mg/m³	6.03E-02
				Mercury	1.26E+03	µg/kg	4.88E-07	mg/m³	--	(mg/m³)⁻¹	NC	3.42E-05	mg/m³	3.00E-04	mg/m³	1.14E-01
				Nickel	1.25E+05	µg/kg	1.06E-08	mg/m³	2.60E-01	(mg/m³)⁻¹	2.76E-09	7.42E-07	mg/m³	9.00E-05	mg/m³	8.24E-03
				Vanadium	2.73E+04	µg/kg	2.31E-09	mg/m³	--	(mg/m³)⁻¹	NC	1.62E-07	mg/m³	--	mg/m³	NC
				Zinc	3.72E+06	µg/kg	3.16E-07	mg/m³	--	(mg/m³)⁻¹	NC	2.21E-05	mg/m³	--	mg/m³	NC
				Aroclor-1248 (PCB-1248)	4.91E+02	µg/kg	4.16E-11	mg/m³	5.70E-01	(mg/m³)⁻¹	2.37E-11	2.91E-09	mg/m³	--	mg/m³	NC
				Aroclor-1254 (PCB-1254)	1.81E+03	µg/kg	1.53E-10	mg/m³	5.70E-01	(mg/m³)⁻¹	8.74E-11	1.07E-08	mg/m³	--	mg/m³	NC
				Aroclor-1260 (PCB-1260)	2.30E+02	µg/kg	1.95E-11	mg/m³	5.70E-01	(mg/m³)⁻¹	1.11E-11	1.37E-09	mg/m³	--	mg/m³	NC
				Dieldrin	3.15E+01	µg/kg	2.67E-12	mg/m³	4.60E+00	(mg/m³)⁻¹	1.23E-11	1.87E-10	mg/m³	--	mg/m³	NC
				Total TEQ	1.20E-02	µg/kg	1.02E-15	mg/m³	3.80E+04	(mg/m³)⁻¹	3.87E-11	7.12E-14	mg/m³	4.00E-08	mg/m³	1.78E-06
			Exp. Route Total								1.36E-08					2.43E-01
		Exposure Point Total									1.36E-08					2.43E-01
	Exposure Medium Total										1.36E-08					2.43E-01
Medium Total											6.76E-07					1.34E+00

TABLE B.7.3.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Sediment	Sediment	On Site	Ingestion	Benzo(a)anthracene	1.50E+03	µg/kg	1.66E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.21E-08	1.16E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	1.99E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.45E-07	1.39E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	2.77E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.02E-08	1.94E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	5.31E-09	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	3.88E-08	3.72E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	2.10E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.54E-08	1.47E-06	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	1.39E-07	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	2.09E-07	9.76E-06	mg/kg-d	3.00E-04	mg/kg-d	3.25E-02
				Cobalt	6.70E+03	µg/kg	7.42E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.19E-06	mg/kg-d	3.00E-04	mg/kg-d	1.73E-02
				Iron	1.35E+07	µg/kg	1.49E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.05E-02	mg/kg-d	7.00E-01	mg/kg-d	1.49E-02
				Manganese	5.45E+05	µg/kg	6.03E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.22E-04	mg/kg-d	2.40E-02	mg/kg-d	1.76E-02
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	7.31E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.46E-08	5.11E-07	mg/kg-d	2.00E-05	mg/kg-d	2.56E-02
			Exp. Route Total								4.56E-07					1.08E-01
			Dermal	Benzo(a)anthracene	1.50E+03	µg/kg	2.16E-10	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.58E-10	1.51E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	2.59E-10	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.89E-09	1.81E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	3.60E-10	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.63E-10	2.52E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	6.91E-11	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	5.04E-10	4.84E-08	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	2.73E-10	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.00E-10	1.91E-07	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	4.18E-10	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	6.28E-10	2.93E-07	mg/kg-d	3.00E-04	mg/kg-d	9.76E-04
				Cobalt	6.70E+03	µg/kg	7.42E-11	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.19E-08	mg/kg-d	3.00E-04	mg/kg-d	1.73E-04
				Iron	1.35E+07	µg/kg	1.49E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.05E-04	mg/kg-d	7.00E-01	mg/kg-d	1.49E-04
				Manganese	5.45E+05	µg/kg	6.03E-09	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.22E-06	mg/kg-d	9.60E-04	mg/kg-d	4.40E-03
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	1.02E-10	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	2.05E-10	7.16E-08	mg/kg-d	2.00E-05	mg/kg-d	3.58E-03
			Exp. Route Total								3.85E-09					9.28E-03
		Exposure Point Total									4.60E-07					1.17E-01
	Exposure Medium Total										4.60E-07					1.17E-01
Medium Total											4.60E-07					1.17E-01
							Total of Receptor Risks Across All Media				1.1E-06	Total of Receptor Hazards Across All Media				1.5E+00

Notes:
NA = Not Applicable
NC = Not Calculated
CSF - Cancer Slope Factor
EPC - Exposure Point Concentration

TABLE B.7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil Gas	Ambient Air	On Site	Inhalation	Benzene	7.25E-03	µg/m³	1.14E-08	mg/m³	7.80E-03	(mg/m³)⁻¹	8.86E-11	7.95E-07	mg/m³	3.00E-02	mg/m³	2.65E-05
				Ethylbenzene	2.11E-02	µg/m³	3.31E-08	mg/m³	2.50E-03	(mg/m³)⁻¹	8.27E-11	2.32E-06	mg/m³	1.00E+00	mg/m³	2.32E-06
				Naphthalene	2.45E-04	µg/m³	3.84E-10	mg/m³	3.40E-02	(mg/m³)⁻¹	1.31E-11	2.69E-08	mg/m³	3.00E-03	mg/m³	8.96E-06
				Trichloroethene	2.60E-02	µg/m³	4.07E-08	mg/m³	2.00E-03	(mg/m³)⁻¹	8.15E-11	2.85E-06	mg/m³	--	mg/m³	NC
				Vinyl chloride	3.27E-03	µg/m³	5.11E-09	mg/m³	4.40E-03	(mg/m³)⁻¹	2.25E-11	3.58E-07	mg/m³	1.00E-01	mg/m³	3.58E-06
			Exp. Route Total								2.88E-10					4.14E-05
		Exposure Point Total									2.88E-10					4.14E-05
	Exposure Medium Total										2.88E-10					4.14E-05
Medium Total											2.88E-10					4.14E-05
Surface and Subsurface Soil	Soil	On Site	Ingestion	Benzene	5.27E+02	µg/kg	1.17E-08	mg/kg-d	5.50E-02	(mg/kg-d)⁻¹	6.42E-10	8.17E-07	mg/kg-d	4.00E-03	mg/kg-d	2.04E-04
				Ethylbenzene	8.62E+03	µg/kg	1.91E-07	mg/kg-d	1.10E-02	(mg/kg-d)⁻¹	2.10E-09	1.34E-05	mg/kg-d	1.00E-01	mg/kg-d	1.34E-04
				Tetrachloroethene	1.90E+02	µg/kg	4.20E-09	mg/kg-d	5.40E-01	(mg/kg-d)⁻¹	2.27E-09	2.94E-07	mg/kg-d	1.00E-02	mg/kg-d	2.94E-05
				Vinyl chloride	1.32E+02	µg/kg	2.92E-09	mg/kg-d	7.20E-01	(mg/kg-d)⁻¹	2.10E-09	2.04E-07	mg/kg-d	3.00E-03	mg/kg-d	6.81E-05
				Xylenes (total)	4.72E+04	µg/kg	1.05E-06	mg/kg-d	--	(mg/kg-d)⁻¹	NC	7.32E-05	mg/kg-d	2.00E-01	mg/kg-d	3.66E-04
				Benzo(a)anthracene	1.93E+03	µg/kg	4.28E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	3.12E-08	2.99E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.44E+03	µg/kg	3.19E-08	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	2.33E-07	2.23E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.23E+03	µg/kg	4.93E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	3.60E-08	3.45E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.16E+03	µg/kg	2.57E-08	mg/kg-d	7.30E-02	(mg/kg-d)⁻¹	1.88E-09	1.80E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	1.60E+02	µg/kg	3.55E-09	mg/kg-d	7.30E+00	(mg/kg-d)⁻¹	2.59E-08	2.49E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	5.97E+02	µg/kg	1.32E-08	mg/kg-d	7.30E-01	(mg/kg-d)⁻¹	9.64E-09	9.25E-07	mg/kg-d	--	mg/kg-d	NC
				Naphthalene	1.54E+03	µg/kg	3.41E-08	mg/kg-d	--	(mg/kg-d)⁻¹	NC	2.38E-06	mg/kg-d	2.00E-02	mg/kg-d	1.19E-04
				Aluminum	6.71E+06	µg/kg	1.49E-04	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.04E-02	mg/kg-d	1.00E+00	mg/kg-d	1.04E-02
				Antimony	8.45E+04	µg/kg	1.87E-06	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.31E-04	mg/kg-d	4.00E-04	mg/kg-d	3.27E-01
				Arsenic	2.22E+04	µg/kg	4.91E-07	mg/kg-d	1.50E+00	(mg/kg-d)⁻¹	7.37E-07	3.44E-05	mg/kg-d	3.00E-04	mg/kg-d	1.15E-01
				Barium	7.84E+05	µg/kg	1.74E-05	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.22E-03	mg/kg-d	2.00E-01	mg/kg-d	6.08E-03
				Cadmium	1.14E+04	µg/kg	2.53E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.77E-05	mg/kg-d	5.00E-04	mg/kg-d	3.54E-02
				Cobalt	2.83E+04	µg/kg	6.26E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	4.38E-05	mg/kg-d	3.00E-04	mg/kg-d	1.46E-01
				Copper	2.97E+07	µg/kg	6.57E-04	mg/kg-d	--	(mg/kg-d)⁻¹	NC	4.60E-02	mg/kg-d	4.00E-02	mg/kg-d	1.15E+00
				Iron	4.53E+07	µg/kg	1.00E-03	mg/kg-d	--	(mg/kg-d)⁻¹	NC	7.01E-02	mg/kg-d	7.00E-01	mg/kg-d	1.00E-01
				Lead	4.53E+06	µg/kg	1.00E-04	mg/kg-d	--	(mg/kg-d)⁻¹	NC	7.02E-03	mg/kg-d	--	mg/kg-d	NC
				Manganese	5.08E+05	µg/kg	1.12E-05	mg/kg-d	--	(mg/kg-d)⁻¹	NC	7.87E-04	mg/kg-d	2.40E-02	mg/kg-d	3.28E-02
				Mercury	1.26E+03	µg/kg	2.79E-08	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.95E-06	mg/kg-d	1.60E-04	mg/kg-d	1.22E-02
				Nickel	1.25E+05	µg/kg	2.77E-06	mg/kg-d	--	(mg/kg-d)⁻¹	NC	1.94E-04	mg/kg-d	2.00E-02	mg/kg-d	9.69E-03
				Vanadium	2.73E+04	µg/kg	6.04E-07	mg/kg-d	--	(mg/kg-d)⁻¹	NC	4.23E-05	mg/kg-d	7.00E-03	mg/kg-d	6.04E-03
				Zinc	3.72E+06	µg/kg	8.24E-05	mg/kg-d	--	(mg/kg-d)⁻¹	NC	5.77E-03	mg/kg-d	3.00E-01	mg/kg-d	1.92E-02
				Aroclor-1248 (PCB-1248)	4.91E+02	µg/kg	1.09E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	2.17E-08	7.61E-07	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	1.81E+03	µg/kg	4.00E-08	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	8.01E-08	2.80E-06	mg/kg-d	2.00E-05	mg/kg-d	1.40E-01
				Aroclor-1260 (PCB-1260)	2.30E+02	µg/kg	5.09E-09	mg/kg-d	2.00E+00	(mg/kg-d)⁻¹	1.02E-08	3.57E-07	mg/kg-d	--	mg/kg-d	NC
				Dieldrin	3.15E+01	µg/kg	6.97E-10	mg/kg-d	1.60E+01	(mg/kg-d)⁻¹	1.11E-08	4.88E-08	mg/kg-d	5.00E-05	mg/kg-d	9.75E-04
				Total TEQ	1.20E-02	µg/kg	2.66E-13	mg/kg-d	1.30E+05	(mg/kg-d)⁻¹	3.45E-08	1.86E-11	mg/kg-d	1.00E-09	mg/kg-d	1.86E-02
			Exp. Route Total								1.24E-06					2.13E+00

TABLE B.7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface and Subsurface Soil	Soil	On Site	Dermal	Benzene	5.27E+02	µg/kg	1.75E-11	mg/kg-d	5.50E-02	(mg/kg-d)$^{-1}$	9.62E-13	1.22E-09	mg/kg-d	4.00E-03	mg/kg-d	3.06E-07
				Ethylbenzene	8.62E+03	µg/kg	1.72E-08	mg/kg-d	1.10E-02	(mg/kg-d)$^{-1}$	1.89E-10	1.20E-06	mg/kg-d	1.00E-01	mg/kg-d	1.20E-05
				Tetrachloroethene	1.90E+02	µg/kg	3.78E-10	mg/kg-d	5.40E-01	(mg/kg-d)$^{-1}$	2.04E-10	2.65E-08	mg/kg-d	1.00E-02	mg/kg-d	2.65E-06
				Vinyl chloride	1.32E+02	µg/kg	4.38E-12	mg/kg-d	7.20E-01	(mg/kg-d)$^{-1}$	3.15E-12	3.06E-10	mg/kg-d	3.00E-03	mg/kg-d	1.02E-07
				Xylenes (total)	4.72E+04	µg/kg	9.41E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.58E-06	mg/kg-d	2.00E-01	mg/kg-d	3.29E-05
				Benzo(a)anthracene	1.93E+03	µg/kg	1.67E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.22E-08	1.17E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.44E+03	µg/kg	1.24E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	9.08E-08	8.70E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.23E+03	µg/kg	1.92E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.40E-08	1.35E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(k)fluoranthene	1.16E+03	µg/kg	1.00E-08	mg/kg-d	7.30E-02	(mg/kg-d)$^{-1}$	7.32E-10	7.02E-07	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	1.60E+02	µg/kg	1.39E-09	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.01E-08	9.70E-08	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	5.97E+02	µg/kg	5.15E-09	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	3.76E-09	3.61E-07	mg/kg-d	--	mg/kg-d	NC
				Naphthalene	1.54E+03	µg/kg	1.33E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	9.30E-07	mg/kg-d	2.00E-02	mg/kg-d	4.65E-05
				Aluminum	6.71E+06	µg/kg	4.46E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.12E-04	mg/kg-d	1.00E+00	mg/kg-d	3.12E-04
				Antimony	8.45E+04	µg/kg	5.61E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.93E-06	mg/kg-d	6.00E-05	mg/kg-d	6.54E-02
				Arsenic	2.22E+04	µg/kg	4.42E-08	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	6.63E-08	3.09E-06	mg/kg-d	3.00E-04	mg/kg-d	1.03E-02
				Barium	7.84E+05	µg/kg	5.21E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.65E-05	mg/kg-d	1.40E-02	mg/kg-d	2.61E-03
				Cadmium	1.14E+04	µg/kg	7.58E-10	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.31E-08	mg/kg-d	2.50E-05	mg/kg-d	2.12E-03
				Cobalt	2.83E+04	µg/kg	1.88E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.31E-06	mg/kg-d	3.00E-04	mg/kg-d	4.38E-03
				Copper	2.97E+07	µg/kg	1.97E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.38E-03	mg/kg-d	4.00E-02	mg/kg-d	3.45E-02
				Iron	4.53E+07	µg/kg	3.01E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.10E-03	mg/kg-d	7.00E-01	mg/kg-d	3.01E-03
				Lead	4.53E+06	µg/kg	3.01E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.11E-04	mg/kg-d	--	mg/kg-d	NC
				Manganese	5.08E+05	µg/kg	3.37E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.36E-05	mg/kg-d	9.60E-04	mg/kg-d	2.46E-02
				Mercury	1.26E+03	µg/kg	8.36E-10	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.85E-08	mg/kg-d	1.60E-04	mg/kg-d	3.66E-04
				Nickel	1.25E+05	µg/kg	8.30E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.81E-06	mg/kg-d	2.00E-02	mg/kg-d	2.91E-04
				Vanadium	2.73E+04	µg/kg	1.81E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.27E-06	mg/kg-d	1.82E-04	mg/kg-d	6.97E-03
				Zinc	3.72E+06	µg/kg	2.47E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.73E-04	mg/kg-d	3.00E-01	mg/kg-d	5.77E-04
				Aroclor-1248 (PCB-1248)	4.91E+02	µg/kg	4.56E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	9.13E-09	3.20E-07	mg/kg-d	--	mg/kg-d	NC
				Aroclor-1254 (PCB-1254)	1.81E+03	µg/kg	1.68E-08	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	3.36E-08	1.18E-06	mg/kg-d	2.00E-05	mg/kg-d	5.88E-02
				Aroclor-1260 (PCB-1260)	2.30E+02	µg/kg	2.14E-09	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	4.28E-09	1.50E-07	mg/kg-d	--	mg/kg-d	NC
				Dieldrin	3.15E+01	µg/kg	2.09E-10	mg/kg-d	1.60E+01	(mg/kg-d)$^{-1}$	3.34E-09	1.46E-08	mg/kg-d	5.00E-05	mg/kg-d	2.93E-04
				Total TEQ	1.20E-02	µg/kg	7.97E-14	mg/kg-d	1.30E+05	(mg/kg-d)$^{-1}$	1.04E-08	5.58E-12	mg/kg-d	1.00E-09	mg/kg-d	5.58E-03
			Exp. Route Total								2.59E-07					2.20E-01
		Exposure Point Total									1.50E-06					2.35E+00
	Exposure Medium Total										1.50E-06					2.35E+00

TABLE B.7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface and Subsurface Soil (1)	Ambient Air	On Site	Inhalation	Benzene	NA	µg/kg	NC	mg/m³	7.80E-03	(mg/m³)⁻¹	NC	NC	mg/m³	3.00E-02	mg/m³	NC
				Ethylbenzene	NA	µg/kg	NC	mg/m³	2.50E-03	(mg/m³)⁻¹	NC	NC	mg/m³	1.00E+00	mg/m³	NC
				Tetrachloroethene	NA	µg/kg	NC	mg/m³	5.90E-03	(mg/m³)⁻¹	NC	NC	mg/m³	4.00E-01	mg/m³	NC
				Vinyl chloride	NA	µg/kg	NC	mg/m³	4.40E-03	(mg/m³)⁻¹	NC	NC	mg/m³	2.70E-01	mg/m³	NC
				Xylenes (total)	NA	µg/kg	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	1.00E-01	mg/m³	NC
				Benzo(a)anthracene	1.93E+03	µg/kg	3.28E-10	mg/m³	1.10E-01	(mg/m³)⁻¹	3.60E-11	2.29E-08	mg/m³	1.00E-01	mg/m³	2.29E-07
				Benzo(a)pyrene	1.44E+03	µg/kg	2.44E-10	mg/m³	1.10E+00	(mg/m³)⁻¹	2.69E-10	1.71E-08	mg/m³	–	mg/m³	NC
				Benzo(b)fluoranthene	2.23E+03	µg/kg	1.27E-08	mg/m³	1.10E-01	(mg/m³)⁻¹	1.39E-09	8.86E-07	mg/m³	–	mg/m³	NC
				Benzo(k)fluoranthene	1.16E+03	µg/kg	1.97E-10	mg/m³	1.10E-01	(mg/m³)⁻¹	2.17E-11	1.38E-08	mg/m³	–	mg/m³	NC
				Dibenz(a,h)anthracene	1.60E+02	µg/kg	2.72E-11	mg/m³	1.20E+00	(mg/m³)⁻¹	3.26E-11	1.90E-09	mg/m³	–	mg/m³	NC
				Indeno(1,2,3-cd) pyrene	5.97E+02	µg/kg	1.01E-10	mg/m³	1.10E-01	(mg/m³)⁻¹	1.11E-11	7.08E-09	mg/m³	–	mg/m³	NC
				Naphthalene	NA	µg/kg	NC	mg/m³	3.40E-02	(mg/m³)⁻¹	NC	NC	mg/m³	3.00E-03	mg/m³	NC
				Aluminum	6.71E+06	µg/kg	1.14E-06	mg/m³	–	(mg/m³)⁻¹	NC	7.96E-05	mg/m³	5.00E-03	mg/m³	1.59E-02
				Antimony	8.45E+04	µg/kg	1.43E-08	mg/m³	–	(mg/m³)⁻¹	NC	1.00E-06	mg/m³	–	mg/m³	NC
				Arsenic	2.22E+04	µg/kg	3.76E-09	mg/m³	4.30E+00	(mg/m³)⁻¹	1.62E-08	2.63E-07	mg/m³	1.50E-05	mg/m³	1.76E-02
				Barium	7.84E+05	µg/kg	1.33E-07	mg/m³	–	(mg/m³)⁻¹	NC	9.31E-06	mg/m³	5.00E-04	mg/m³	1.86E-02
				Cadmium	1.14E+04	µg/kg	1.94E-09	mg/m³	1.80E+00	(mg/m³)⁻¹	3.48E-09	1.36E-07	mg/m³	1.00E-05	mg/m³	1.36E-02
				Cobalt	2.83E+04	µg/kg	4.79E-09	mg/m³	–	(mg/m³)⁻¹	NC	3.36E-07	mg/m³	6.00E-06	mg/m³	5.59E-02
				Copper	2.97E+07	µg/kg	5.03E-06	mg/m³	–	(mg/m³)⁻¹	NC	3.52E-04	mg/m³	–	mg/m³	NC
				Iron	4.53E+07	µg/kg	7.68E-06	mg/m³	–	(mg/m³)⁻¹	NC	5.37E-04	mg/m³	–	mg/m³	NC
				Lead	4.53E+06	µg/kg	7.68E-07	mg/m³	–	(mg/m³)⁻¹	NC	5.38E-05	mg/m³	–	mg/m³	NC
				Manganese	5.08E+05	µg/kg	8.61E-08	mg/m³	–	(mg/m³)⁻¹	NC	6.03E-06	mg/m³	5.00E-05	mg/m³	1.21E-01
				Mercury	1.26E+03	µg/kg	9.77E-07	mg/m³	–	(mg/m³)⁻¹	NC	6.84E-05	mg/m³	3.00E-04	mg/m³	2.28E-01
				Nickel	1.25E+05	µg/kg	2.12E-08	mg/m³	2.60E-01	(mg/m³)⁻¹	5.51E-09	1.48E-06	mg/m³	9.00E-05	mg/m³	1.65E-02
				Vanadium	2.73E+04	µg/kg	4.63E-09	mg/m³	–	(mg/m³)⁻¹	NC	3.24E-07	mg/m³	–	mg/m³	NC
				Zinc	3.72E+06	µg/kg	6.31E-07	mg/m³	–	(mg/m³)⁻¹	NC	4.42E-05	mg/m³	–	mg/m³	NC
				Aroclor-1248 (PCB-1248)	4.91E+02	µg/kg	8.32E-11	mg/m³	5.70E-01	(mg/m³)⁻¹	4.75E-11	5.83E-09	mg/m³	–	mg/m³	NC
				Aroclor-1254 (PCB-1254)	1.81E+03	µg/kg	3.07E-10	mg/m³	5.70E-01	(mg/m³)⁻¹	1.75E-10	2.15E-08	mg/m³	–	mg/m³	NC
				Aroclor-1260 (PCB-1260)	2.30E+02	µg/kg	3.90E-11	mg/m³	5.70E-01	(mg/m³)⁻¹	2.22E-11	2.73E-09	mg/m³	–	mg/m³	NC
				Dieldrin	3.15E+01	µg/kg	5.34E-12	mg/m³	4.60E+00	(mg/m³)⁻¹	2.46E-11	3.74E-10	mg/m³	–	mg/m³	NC
				Total TEQ	1.20E-02	µg/kg	2.04E-15	mg/m³	3.80E+04	(mg/m³)⁻¹	7.73E-11	1.42E-13	mg/m³	4.00E-08	mg/m³	3.56E-06
			Exp. Route Total								2.73E-08					4.87E-01
		Exposure Point Total									2.73E-08					4.87E-01
	Exposure Medium Total										2.73E-08					4.87E-01
Medium Total											1.53E-06					2.84E+00

TABLE B.7.3.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer	Intake/Exposure Concentration		RfD/RfC		Hazard
							Value	Units	Value	Units	Risk	Value	Units	Value	Units	Quotient
Sediment	Sediment	On Site	Ingestion	Benzo(a)anthracene	1.50E+03	µg/kg	3.32E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	2.42E-08	2.32E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	3.99E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	2.91E-07	2.79E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	5.54E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	4.04E-08	3.87E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	1.06E-08	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	7.76E-08	7.44E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	4.21E-08	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	3.07E-08	2.94E-06	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	2.79E-07	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	4.18E-07	1.95E-05	mg/kg-d	3.00E-04	mg/kg-d	6.51E-02
				Cobalt	6.70E+03	µg/kg	1.48E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.04E-05	mg/kg-d	3.00E-04	mg/kg-d	3.46E-02
				Iron	1.35E+07	µg/kg	2.99E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.09E-02	mg/kg-d	7.00E-01	mg/kg-d	2.99E-02
				Manganese	5.45E+05	µg/kg	1.21E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	8.45E-04	mg/kg-d	2.40E-02	mg/kg-d	3.52E-02
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	1.46E-08	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	2.92E-08	1.02E-06	mg/kg-d	2.00E-05	mg/kg-d	5.11E-02
			Exp. Route Total								9.12E-07					2.16E-01
			Dermal	Benzo(a)anthracene	1.50E+03	µg/kg	1.30E-09	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	9.46E-10	9.07E-07	mg/kg-d	--	mg/kg-d	NC
				Benzo(a)pyrene	1.80E+03	µg/kg	1.55E-09	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	1.13E-08	1.09E-06	mg/kg-d	--	mg/kg-d	NC
				Benzo(b)fluoranthene	2.50E+03	µg/kg	2.16E-09	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.58E-09	1.51E-06	mg/kg-d	--	mg/kg-d	NC
				Dibenz(a,h)anthracene	4.80E+02	µg/kg	4.14E-10	mg/kg-d	7.30E+00	(mg/kg-d)$^{-1}$	3.03E-09	2.90E-07	mg/kg-d	--	mg/kg-d	NC
				Indeno(1,2,3-cd) pyrene	1.90E+03	µg/kg	1.64E-09	mg/kg-d	7.30E-01	(mg/kg-d)$^{-1}$	1.20E-09	1.15E-06	mg/kg-d	--	mg/kg-d	NC
				Arsenic	1.26E+04	µg/kg	2.51E-09	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	3.77E-09	1.76E-06	mg/kg-d	3.00E-04	mg/kg-d	5.86E-03
				Cobalt	6.70E+03	µg/kg	4.45E-10	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.12E-07	mg/kg-d	3.00E-04	mg/kg-d	1.04E-03
				Iron	1.35E+07	µg/kg	8.97E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.28E-04	mg/kg-d	7.00E-01	mg/kg-d	8.97E-04
				Manganese	5.45E+05	µg/kg	3.62E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.53E-05	mg/kg-d	9.60E-04	mg/kg-d	2.64E-02
				Aroclor-1254 (PCB-1254)	6.60E+02	µg/kg	6.14E-10	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.23E-09	4.30E-07	mg/kg-d	2.00E-05	mg/kg-d	2.15E-02
			Exp. Route Total								2.31E-08					5.57E-02
		Exposure Point Total									9.35E-07					2.72E-01
	Exposure Medium Total										9.35E-07					2.72E-01
Medium Total											9.35E-07					2.72E-01
							Total of Receptor Risks Across All Media				2.5E-06	Total of Receptor Hazards Across All Media				3.1E+00

Notes:
NA = Not Applicable
NC = Not Calculated
CSF - Cancer Slope Factor

TABLE B.7.4.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE RESIDENT
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air	Off Site	Inhalation	1,1-Dichloroethane	2.90E+01	µg/m³	2.75E-03	mg/m³	1.60E-03	(mg/m³)⁻¹	4.41E-06	2.14E-02	mg/m³	--	mg/m³	NC
				1,2-Dichloroethane	3.85E-02	µg/m³	3.66E-06	mg/m³	2.60E-02	(mg/m³)⁻¹	9.51E-08	2.84E-05	mg/m³	2.40E+00	mg/m³	1.19E-05
				Benzene	1.51E+00	µg/m³	1.43E-04	mg/m³	7.80E-03	(mg/m³)⁻¹	1.12E-06	1.12E-03	mg/m³	3.00E-02	mg/m³	3.72E-02
				Chlorobenzene	1.48E-01	µg/m³	1.40E-05	mg/m³	--	(mg/m³)⁻¹	NC	1.09E-04	mg/m³	5.00E-02	mg/m³	2.18E-03
				Chloroform	6.09E-02	µg/m³	5.79E-06	mg/m³	2.30E-02	(mg/m³)⁻¹	1.33E-07	4.50E-05	mg/m³	9.80E-02	mg/m³	4.59E-04
				cis-1,2-Dichloroethene	9.11E+00	µg/m³	8.66E-04	mg/m³	--	(mg/m³)⁻¹	NC	6.73E-03	mg/m³	--	mg/m³	NC
				Dibromochloromethane	8.40E-03	µg/m³	7.98E-07	mg/m³	2.70E-02	(mg/m³)⁻¹	2.15E-08	6.21E-06	mg/m³	--	mg/m³	NC
				Ethylbenzene	3.02E-01	µg/m³	2.87E-05	mg/m³	2.50E-03	(mg/m³)⁻¹	7.17E-08	2.23E-04	mg/m³	1.00E+00	mg/m³	2.23E-04
				Methylene chloride	8.49E-02	µg/m³	8.07E-06	mg/m³	4.70E-04	(mg/m³)⁻¹	3.79E-09	6.28E-05	mg/m³	1.00E+00	mg/m³	6.28E-05
				Tetrachloroethene	1.97E-01	µg/m³	1.87E-05	mg/m³	5.90E-03	(mg/m³)⁻¹	1.10E-07	1.46E-04	mg/m³	2.70E-01	mg/m³	5.39E-04
				Trichloroethene	2.04E+01	µg/m³	1.94E-03	mg/m³	2.00E-03	(mg/m³)⁻¹	3.87E-06	1.51E-02	mg/m³	--	mg/m³	NC
				Vinyl chloride	1.98E+01	µg/m³	1.88E-03	mg/m³	4.40E-03	(mg/m³)⁻¹	8.29E-06	1.46E-02	mg/m³	1.00E-01	mg/m³	1.46E-01
				Xylenes (total)	2.52E-01	µg/m³	2.39E-05	mg/m³	--	(mg/m³)⁻¹	NC	1.86E-04	mg/m³	1.00E-01	mg/m³	1.86E-03
				2-Methylnaphthalene	1.07E-02	µg/m³	1.02E-06	mg/m³	--	(mg/m³)⁻¹	NC	7.92E-06	mg/m³	--	mg/m³	NC
				bis(2-Ethylhexyl)phthalate	NA	µg/m³	NC	mg/m³	2.40E-03	(mg/m³)⁻¹	NC	NC	mg/m³	--	mg/m³	NC
				Naphthalene	6.57E-03	µg/m³	6.24E-07	mg/m³	3.40E-02	(mg/m³)⁻¹	2.12E-08	4.86E-06	mg/m³	3.00E-03	mg/m³	1.62E-03
				Aluminum	NA	µg/m³	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-03	mg/m³	NC
				Antimony	NA	µg/m³	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	--	mg/m³	NC
				Arsenic	NA	µg/m³	NC	mg/m³	4.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	1.50E-05	mg/m³	NC
				Barium	NA	µg/m³	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-04	mg/m³	NC
				Cobalt	NA	µg/m³	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	6.00E-06	mg/m³	NC
				Iron	NA	µg/m³	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	--	mg/m³	NC
				Lead	NA	µg/m³	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	--	mg/m³	NC
				Manganese	NA	µg/m³	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-05	mg/m³	NC
				Selenium	NA	µg/m³	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	2.00E-02	mg/m³	NC
				Vanadium	NA	µg/m³	NC	mg/m³	--	(mg/m³)⁻¹	NC	NC	mg/m³	--	mg/m³	NC
				Aroclor-1260 (PCB-1260)	NA	µg/m³	NC	mg/m³	5.70E-01	(mg/m³)⁻¹	NC	NC	mg/m³	--	mg/m³	NC
				Heptachlor	NA	µg/m³	NC	mg/m³	1.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	--	mg/m³	NC
			Exp. Route Total								1.81E-05					1.91E-01
		Exposure Point Total									1.81E-05					1.91E-01
	Exposure Medium Total										1.81E-05					1.91E-01
Medium Total											1.81E-05					1.91E-01

TABLE 8.7.4.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE RESIDENT
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Household Use	Off Site	Ingestion	1,1-Dichloroethane	2.14E+02	µg/L	1.43E-03	mg/kg-d	5.70E-03	(mg/kg-d)$^{-1}$	8.12E-06	1.37E-02	mg/kg-d	2.00E-01	mg/kg-d	6.85E-02
				1,2-Dichloroethane	1.41E+00	µg/L	9.36E-06	mg/kg-d	9.10E-02	(mg/kg-d)$^{-1}$	8.52E-07	9.00E-05	mg/kg-d	2.00E-02	mg/kg-d	4.50E-03
				Benzene	1.07E+01	µg/L	7.11E-05	mg/kg-d	5.50E-02	(mg/kg-d)$^{-1}$	3.91E-06	6.83E-04	mg/kg-d	4.00E-03	mg/kg-d	1.71E-01
				Chlorobenzene	2.03E+00	µg/L	1.35E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.30E-04	mg/kg-d	2.00E-02	mg/kg-d	6.49E-03
				Chloroform	5.59E-01	µg/L	3.72E-06	mg/kg-d	3.10E-02	(mg/kg-d)$^{-1}$	1.15E-07	3.57E-05	mg/kg-d	1.00E-02	mg/kg-d	3.57E-03
				cis-1,2-Dichloroethene	9.51E+01	µg/L	6.33E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.08E-03	mg/kg-d	1.00E-02	mg/kg-d	6.08E-01
				Dibromochloromethane	1.00E+00	µg/L	6.65E-06	mg/kg-d	8.40E-02	(mg/kg-d)$^{-1}$	5.59E-07	6.39E-05	mg/kg-d	2.00E-02	mg/kg-d	3.20E-03
				Ethylbenzene	1.98E+00	µg/L	1.32E-05	mg/kg-d	1.10E-02	(mg/kg-d)$^{-1}$	1.45E-07	1.27E-04	mg/kg-d	1.00E-01	mg/kg-d	1.27E-03
				Methylene chloride	1.27E+00	µg/L	8.43E-06	mg/kg-d	7.50E-03	(mg/kg-d)$^{-1}$	6.32E-08	8.10E-05	mg/kg-d	6.00E-02	mg/kg-d	1.35E-03
				Tetrachloroethene	5.44E-01	µg/L	3.62E-06	mg/kg-d	5.40E-01	(mg/kg-d)$^{-1}$	1.95E-06	3.48E-05	mg/kg-d	1.00E-02	mg/kg-d	3.48E-03
				Trichloroethene	8.67E+01	µg/L	5.77E-04	mg/kg-d	5.90E-03	(mg/kg-d)$^{-1}$	3.40E-06	5.54E-03	mg/kg-d	--	mg/kg-d	NC
				Vinyl chloride	1.99E+01	µg/L	1.32E-04	mg/kg-d	7.20E-01	(mg/kg-d)$^{-1}$	9.53E-05	1.27E-03	mg/kg-d	3.00E-03	mg/kg-d	4.24E-01
				Xylenes (total)	2.01E+00	µg/L	1.34E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.28E-04	mg/kg-d	2.00E-01	mg/kg-d	6.42E-04
				2-Methylnaphthalene	1.97E+00	µg/L	1.31E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.26E-04	mg/kg-d	4.00E-03	mg/kg-d	3.14E-02
				bis(2-Ethylhexyl)phthalate	1.63E+00	µg/L	1.09E-05	mg/kg-d	1.40E-02	(mg/kg-d)$^{-1}$	1.52E-07	1.04E-04	mg/kg-d	2.00E-02	mg/kg-d	5.22E-03
				Naphthalene	9.39E-01	µg/L	6.25E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.00E-05	mg/kg-d	2.00E-02	mg/kg-d	3.00E-03
				Aluminum	1.03E+03	µg/L	6.85E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.58E-02	mg/kg-d	1.00E+00	mg/kg-d	6.58E-02
				Antimony	9.08E-01	µg/L	6.04E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.81E-05	mg/kg-d	4.00E-04	mg/kg-d	1.45E-01
				Arsenic	1.39E+01	µg/L	9.23E-05	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	1.39E-04	8.87E-04	mg/kg-d	3.00E-04	mg/kg-d	2.96E+00
				Barium	5.58E+02	µg/L	3.72E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.57E-02	mg/kg-d	2.00E-01	mg/kg-d	1.78E-01
				Cobalt	6.02E+00	µg/L	4.00E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.85E-04	mg/kg-d	3.00E-04	mg/kg-d	1.28E+00
				Iron	4.11E+03	µg/L	2.74E-02	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.63E-01	mg/kg-d	7.00E-01	mg/kg-d	3.76E-01
				Lead	9.13E+00	µg/L	6.07E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.84E-04	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.81E+02	µg/L	2.54E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.44E-02	mg/kg-d	2.40E-02	mg/kg-d	1.02E+00
				Selenium	6.00E+00	µg/L	3.99E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.84E-04	mg/kg-d	5.00E-03	mg/kg-d	7.67E-02
				Vanadium	2.42E+01	µg/L	1.61E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.55E-03	mg/kg-d	7.00E-03	mg/kg-d	2.21E-01
				Aroclor-1260 (PCB-1260)	2.00E-01	µg/L	1.33E-06	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	2.67E-06	1.28E-05	mg/kg-d	--	mg/kg-d	NC
				Heptachlor	4.63E-02	µg/L	3.08E-07	mg/kg-d	4.50E+00	(mg/kg-d)$^{-1}$	1.39E-06	2.96E-06	mg/kg-d	5.00E-04	mg/kg-d	5.92E-03
			Exp. Route Total								2.57E-04					7.66E+00
			Dermal	1,1-Dichloroethane	2.14E+02	µg/L	6.34E-05	mg/kg-d	5.70E-03	(mg/kg-d)$^{-1}$	3.61E-07	1.69E-06	mg/kg-d	2.00E-01	mg/kg-d	8.43E-06
				1,2-Dichloroethane	1.41E+00	µg/L	2.61E-07	mg/kg-d	9.10E-02	(mg/kg-d)$^{-1}$	2.38E-08	6.94E-09	mg/kg-d	2.00E-02	mg/kg-d	3.47E-07
				Benzene	1.07E+01	µg/L	6.19E-06	mg/kg-d	5.50E-02	(mg/kg-d)$^{-1}$	3.40E-07	1.64E-07	mg/kg-d	4.00E-03	mg/kg-d	4.11E-05
				Chlorobenzene	2.03E+00	µg/L	2.74E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	7.28E-08	mg/kg-d	2.00E-02	mg/kg-d	3.64E-06
				Chloroform	5.59E-01	µg/L	1.92E-07	mg/kg-d	3.10E-02	(mg/kg-d)$^{-1}$	5.94E-09	5.09E-09	mg/kg-d	1.00E-02	mg/kg-d	5.09E-07
				cis-1,2-Dichloroethene	9.51E+01	µg/L	3.18E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	8.46E-07	mg/kg-d	1.00E-02	mg/kg-d	8.46E-05
				Dibromochloromethane	1.00E+00	µg/L	2.86E-07	mg/kg-d	8.40E-02	(mg/kg-d)$^{-1}$	2.40E-08	7.60E-09	mg/kg-d	2.00E-02	mg/kg-d	3.80E-07
				Ethylbenzene	1.98E+00	µg/L	4.50E-06	mg/kg-d	1.10E-02	(mg/kg-d)$^{-1}$	4.95E-08	1.20E-07	mg/kg-d	1.00E-01	mg/kg-d	1.20E-06

TABLE B.7.4.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE RESIDENT
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.'d)	Household Use	Off Site	Dermal	Methylene chloride	1.27E+00	µg/L	1.79E-07	mg/kg-d	7.50E-03	$(mg/kg\text{-}d)^{-1}$	1.34E-09	4.75E-09	mg/kg-d	6.00E-02	mg/kg-d	7.92E-08
				Tetrachloroethene	5.44E-01	µg/L	1.22E-06	mg/kg-d	5.40E-01	$(mg/kg\text{-}d)^{-1}$	6.59E-07	3.24E-08	mg/kg-d	1.00E-02	mg/kg-d	3.24E-06
				Trichloroethene	8.67E+01	µg/L	5.67E-05	mg/kg-d	5.90E-03	$(mg/kg\text{-}d)^{-1}$	3.34E-07	1.51E-06	mg/kg-d	--	mg/kg-d	NC
				Vinyl chloride	1.99E+01	µg/L	3.89E-06	mg/kg-d	7.20E-01	$(mg/kg\text{-}d)^{-1}$	2.80E-06	1.03E-07	mg/kg-d	3.00E-03	mg/kg-d	3.45E-05
				Xylenes (total)	2.01E+00	µg/L	4.93E-06	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	1.31E-07	mg/kg-d	2.00E-01	mg/kg-d	6.55E-07
				2-Methylnaphthalene	1.97E+00	µg/L	1.03E-05	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	2.73E-07	mg/kg-d	4.00E-03	mg/kg-d	6.82E-05
				bis(2-Ethylhexyl)phthalate	1.63E+00	µg/L	9.48E-06	mg/kg-d	1.40E-02	$(mg/kg\text{-}d)^{-1}$	1.33E-07	2.52E-07	mg/kg-d	2.00E-02	mg/kg-d	1.26E-05
				Naphthalene	9.39E-01	µg/L	2.35E-06	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	6.26E-08	mg/kg-d	2.00E-02	mg/kg-d	3.13E-06
				Aluminum	1.03E+03	µg/L	1.50E-05	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	4.10E-07	mg/kg-d	1.00E+00	mg/kg-d	4.10E-07
				Antimony	9.08E-01	µg/L	1.32E-08	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	3.61E-10	mg/kg-d	6.00E-05	mg/kg-d	6.02E-06
				Arsenic	1.39E+01	µg/L	2.02E-07	mg/kg-d	1.50E+00	$(mg/kg\text{-}d)^{-1}$	3.03E-07	5.52E-09	mg/kg-d	3.00E-04	mg/kg-d	1.84E-05
				Barium	5.58E+02	µg/L	8.14E-06	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	2.22E-07	mg/kg-d	1.40E-02	mg/kg-d	1.59E-05
				Cobalt	6.02E+00	µg/L	3.51E-08	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	9.57E-10	mg/kg-d	3.00E-04	mg/kg-d	3.19E-06
				Iron	4.11E+03	µg/L	6.00E-05	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	1.64E-06	mg/kg-d	7.00E-01	mg/kg-d	2.34E-06
				Lead	9.13E+00	µg/L	1.33E-08	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	3.63E-10	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.81E+02	µg/L	5.56E-06	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	1.52E-07	mg/kg-d	9.60E-04	mg/kg-d	1.58E-04
				Selenium	6.00E+00	µg/L	8.75E-08	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	2.39E-09	mg/kg-d	5.00E-03	mg/kg-d	4.78E-07
				Vanadium	2.42E+01	µg/L	3.53E-07	mg/kg-d	--	$(mg/kg\text{-}d)^{-1}$	NC	9.63E-09	mg/kg-d	1.82E-04	mg/kg-d	5.29E-05
				Aroclor-1260 (PCB-1260)	2.00E-01	µg/L	1.66E-04	mg/kg-d	2.00E+00	$(mg/kg\text{-}d)^{-1}$	3.33E-04	4.42E-06	mg/kg-d	--	mg/kg-d	NC
				Heptachlor	4.63E-02	µg/L	8.26E-08	mg/kg-d	4.50E+00	$(mg/kg\text{-}d)^{-1}$	3.72E-07	2.19E-09	mg/kg-d	5.00E-04	mg/kg-d	4.39E-06
			Exp. Route Total								3.38E-04					5.24E-04
		Exposure Point Total									5.96E-04					7.66E+00
Exposure Medium Total											5.96E-04					7.66E+00
	Household Use to Ambient Air	Off Site	Inhalation	1,1-Dichloroethane	2.14E+02	µg/L	1.67E-04	mg/m^3	1.60E-03	$(mg/m^3)^{-1}$	2.67E-07	1.41E-03	mg/m^3	--	mg/m^3	NC
				1,2-Dichloroethane	1.41E+00	µg/L	1.10E-06	mg/m^3	2.60E-02	$(mg/m^3)^{-1}$	2.85E-08	9.28E-06	mg/m^3	2.40E+00	mg/m^3	3.87E-06
				Benzene	1.07E+01	µg/L	8.33E-06	mg/m^3	7.80E-03	$(mg/m^3)^{-1}$	6.49E-08	7.05E-05	mg/m^3	3.00E-02	mg/m^3	2.35E-03
				Chlorobenzene	2.03E+00	µg/L	1.58E-06	mg/m^3	--	$(mg/m^3)^{-1}$	NC	1.34E-05	mg/m^3	5.00E-02	mg/m^3	2.68E-04
				Chloroform	5.59E-01	µg/L	4.36E-07	mg/m^3	2.30E-02	$(mg/m^3)^{-1}$	1.00E-08	3.69E-06	mg/m^3	9.80E-02	mg/m^3	3.76E-05
				cis-1,2-Dichloroethene	9.51E+01	µg/L	7.41E-05	mg/m^3	--	$(mg/m^3)^{-1}$	NC	6.27E-04	mg/m^3	--	mg/m^3	NC
				Dibromochloromethane	1.00E+00	µg/L	7.79E-07	mg/m^3	2.70E-02	$(mg/m^3)^{-1}$	2.10E-08	6.59E-06	mg/m^3	--	mg/m^3	NC
				Ethylbenzene	1.98E+00	µg/L	1.55E-06	mg/m^3	2.50E-03	$(mg/m^3)^{-1}$	3.86E-09	1.31E-05	mg/m^3	1.00E+00	mg/m^3	1.31E-05
				Methylene chloride	1.27E+00	µg/L	9.87E-07	mg/m^3	4.70E-04	$(mg/m^3)^{-1}$	4.64E-10	8.35E-06	mg/m^3	1.00E+00	mg/m^3	8.35E-06
				Tetrachloroethene	5.44E-01	µg/L	4.24E-07	mg/m^3	5.90E-03	$(mg/m^3)^{-1}$	2.50E-09	3.59E-06	mg/m^3	2.70E-01	mg/m^3	1.33E-05
				Trichloroethene	8.67E+01	µg/L	6.76E-05	mg/m^3	2.00E-03	$(mg/m^3)^{-1}$	1.35E-07	5.72E-04	mg/m^3	--	mg/m^3	NC
				Vinyl chloride	1.99E+01	µg/L	1.55E-05	mg/m^3	4.40E-03	$(mg/m^3)^{-1}$	6.82E-08	1.31E-04	mg/m^3	1.00E-01	mg/m^3	1.31E-03
				Xylenes (total)	2.01E+00	µg/L	1.56E-06	mg/m^3	--	$(mg/m^3)^{-1}$	NC	1.32E-05	mg/m^3	1.00E-01	mg/m^3	1.32E-04

TABLE B.7.4.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE RESIDENT
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.'d)	Household Use to Ambient Air	Off Site	Inhalation	2-Methylnaphthalene	1.97E+00	µg/L	1.53E-06	mg/m³	–	(mg/m³)⁻¹	NC	1.30E-05	mg/m³	–	mg/m³	NC
				bis(2-Ethylhexyl)phthalate	NA	µg/L	NC	mg/m³	2.40E-03	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Naphthalene	9.39E-01	µg/L	7.32E-07	mg/m³	3.40E-02	(mg/m³)⁻¹	2.49E-08	6.19E-06	mg/m³	3.00E-03	mg/m³	2.06E-03
				Aluminum	NA	µg/L	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-03	mg/m³	NC
				Antimony	NA	µg/L	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Arsenic	NA	µg/L	NC	mg/m³	4.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	1.50E-05	mg/m³	NC
				Barium	NA	µg/L	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-04	mg/m³	NC
				Cobalt	NA	µg/L	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	6.00E-06	mg/m³	NC
				Iron	NA	µg/L	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Lead	NA	µg/L	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Manganese	NA	µg/L	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-05	mg/m³	NC
				Selenium	NA	µg/L	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	2.00E-02	mg/m³	NC
				Vanadium	NA	µg/L	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Aroclor-1260 (PCB-1260)	NA	µg/L	NC	mg/m³	5.70E-01	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Heptachlor	NA	µg/L	NC	mg/m³	1.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
			Exp. Route Total								6.27E-07					6.20E-03
		Exposure Point Total									6.27E-07					6.20E-03
	Exposure Medium Total										6.27E-07					6.20E-03
Medium Total											5.96E-04					7.67E+00
							Total of Receptor Risks Across All Media				6.1E-04	Total of Receptor Hazards Across All Media				7.9E+00

Note:
NA = Not Applicable
NC = Not Calculated

TABLE B.7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE RESIDENT
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air	Off Site	Inhalation	1,1-Dichloroethane	2.90E+01	µg/m³	1.19E-02	mg/m³	1.60E-03	(mg/m³)⁻¹	1.91E-05	2.78E-02	mg/m³	–	mg/m³	NC
				1,2-Dichloroethane	3.85E-02	µg/m³	1.58E-05	mg/m³	2.60E-02	(mg/m³)⁻¹	4.11E-07	3.69E-05	mg/m³	2.40E+00	mg/m³	1.54E-05
				Benzene	1.51E+00	µg/m³	6.21E-04	mg/m³	7.80E-03	(mg/m³)⁻¹	4.84E-06	1.45E-03	mg/m³	3.00E-02	mg/m³	4.83E-02
				Chlorobenzene	1.48E-01	µg/m³	6.06E-05	mg/m³	–	(mg/m³)⁻¹	NC	1.42E-04	mg/m³	5.00E-02	mg/m³	2.83E-03
				Chloroform	6.09E-02	µg/m³	2.50E-05	mg/m³	2.30E-02	(mg/m³)⁻¹	5.75E-07	5.84E-05	mg/m³	9.80E-02	mg/m³	5.96E-04
				cis-1,2-Dichloroethene	9.11E+00	µg/m³	3.74E-03	mg/m³	–	(mg/m³)⁻¹	NC	8.74E-03	mg/m³	–	mg/m³	NC
				Dibromochloromethane	8.40E-03	µg/m³	3.45E-06	mg/m³	2.70E-02	(mg/m³)⁻¹	9.32E-08	8.05E-06	mg/m³	–	mg/m³	NC
				Ethylbenzene	3.02E-01	µg/m³	1.24E-04	mg/m³	2.50E-03	(mg/m³)⁻¹	3.10E-07	2.89E-04	mg/m³	1.00E+00	mg/m³	2.89E-04
				Methylene chloride	8.49E-02	µg/m³	3.49E-05	mg/m³	4.70E-04	(mg/m³)⁻¹	1.64E-08	8.15E-05	mg/m³	1.00E+00	mg/m³	8.15E-05
				Tetrachloroethene	1.97E-01	µg/m³	8.10E-05	mg/m³	5.90E-03	(mg/m³)⁻¹	4.78E-07	1.89E-04	mg/m³	2.70E-01	mg/m³	7.00E-04
				Trichloroethene	2.04E+01	µg/m³	8.38E-03	mg/m³	2.00E-03	(mg/m³)⁻¹	1.68E-05	1.95E-02	mg/m³	–	mg/m³	NC
				Vinyl chloride	1.98E+01	µg/m³	8.15E-03	mg/m³	4.40E-03	(mg/m³)⁻¹	3.58E-05	1.90E-02	mg/m³	1.00E-01	mg/m³	1.90E-01
				Xylenes (total)	2.52E-01	µg/m³	1.03E-04	mg/m³	–	(mg/m³)⁻¹	NC	2.41E-04	mg/m³	1.00E-01	mg/m³	2.41E-03
				2-Methylnaphthalene	1.07E-02	µg/m³	4.40E-06	mg/m³	–	(mg/m³)⁻¹	NC	1.03E-05	mg/m³	–	mg/m³	NC
				bis(2-Ethylhexyl)phthalate	NA	µg/m³	NC	mg/m³	2.40E-03	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Naphthalene	6.57E-03	µg/m³	2.70E-06	mg/m³	3.40E-02	(mg/m³)⁻¹	9.18E-08	6.30E-06	mg/m³	3.00E-03	mg/m³	2.10E-03
				Aluminum	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-03	mg/m³	NC
				Antimony	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Arsenic	NA	µg/m³	NC	mg/m³	4.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	1.50E-05	mg/m³	NC
				Barium	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-04	mg/m³	NC
				Cobalt	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	6.00E-06	mg/m³	NC
				Iron	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Lead	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Manganese	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-05	mg/m³	NC
				Selenium	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	2.00E-02	mg/m³	NC
				Vanadium	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Aroclor-1260 (PCB-1260)	NA	µg/m³	NC	mg/m³	5.70E-01	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Heptachlor	NA	µg/m³	NC	mg/m³	1.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
			Exp. Route Total								7.85E-05					2.47E-01
		Exposure Point Total									7.85E-05					2.47E-01
	Exposure Medium Total										7.85E-05					2.47E-01
Medium Total											7.85E-05					2.47E-01

TABLE B.7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE RESIDENT
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Household Use	Off Site	Ingestion	1,1-Dichloroethane	2.14E+02	µg/L	3.19E-03	mg/kg-d	5.70E-03	(mg/kg-d)$^{-1}$	1.82E-05	1.37E-02	mg/kg-d	2.00E-01	mg/kg-d	6.85E-02
				1,2-Dichloroethane	1.41E+00	µg/L	2.09E-05	mg/kg-d	9.10E-02	(mg/kg-d)$^{-1}$	1.90E-06	9.00E-05	mg/kg-d	2.00E-02	mg/kg-d	4.50E-03
				Benzene	1.07E+01	µg/L	1.59E-04	mg/kg-d	5.50E-02	(mg/kg-d)$^{-1}$	8.74E-06	6.83E-04	mg/kg-d	4.00E-03	mg/kg-d	1.71E-01
				Chlorobenzene	2.03E+00	µg/L	3.02E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.30E-04	mg/kg-d	2.00E-02	mg/kg-d	6.49E-03
				Chloroform	5.59E-01	µg/L	8.32E-06	mg/kg-d	3.10E-02	(mg/kg-d)$^{-1}$	2.58E-07	3.57E-05	mg/kg-d	1.00E-02	mg/kg-d	3.57E-03
				cis-1,2-Dichloroethene	9.51E+01	µg/L	1.42E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.08E-03	mg/kg-d	1.00E-02	mg/kg-d	6.08E-01
				Dibromochloromethane	1.00E+00	µg/L	1.49E-05	mg/kg-d	8.40E-02	(mg/kg-d)$^{-1}$	1.25E-06	6.39E-05	mg/kg-d	2.00E-02	mg/kg-d	3.20E-03
				Ethylbenzene	1.98E+00	µg/L	2.95E-05	mg/kg-d	1.10E-02	(mg/kg-d)$^{-1}$	3.24E-07	1.27E-04	mg/kg-d	1.00E-01	mg/kg-d	1.27E-03
				Methylene chloride	1.27E+00	µg/L	1.88E-05	mg/kg-d	7.50E-03	(mg/kg-d)$^{-1}$	1.41E-07	8.10E-05	mg/kg-d	6.00E-02	mg/kg-d	1.35E-03
				Tetrachloroethene	5.44E-01	µg/L	8.09E-06	mg/kg-d	5.40E-01	(mg/kg-d)$^{-1}$	4.37E-06	3.48E-05	mg/kg-d	1.00E-02	mg/kg-d	3.48E-03
				Trichloroethene	8.67E+01	µg/L	1.29E-03	mg/kg-d	5.90E-03	(mg/kg-d)$^{-1}$	7.61E-06	5.54E-03	mg/kg-d	--	mg/kg-d	NC
				Vinyl chloride	1.99E+01	µg/L	2.96E-04	mg/kg-d	7.20E-01	(mg/kg-d)$^{-1}$	2.13E-04	1.27E-03	mg/kg-d	3.00E-03	mg/kg-d	4.24E-01
				Xylenes (total)	2.01E+00	µg/L	2.99E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.28E-04	mg/kg-d	2.00E-01	mg/kg-d	6.42E-04
				2-Methylnaphthalene	1.97E+00	µg/L	2.93E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.26E-04	mg/kg-d	4.00E-03	mg/kg-d	3.14E-02
				bis(2-Ethylhexyl)phthalate	1.63E+00	µg/L	2.43E-05	mg/kg-d	1.40E-02	(mg/kg-d)$^{-1}$	3.40E-07	1.04E-04	mg/kg-d	2.00E-02	mg/kg-d	5.22E-03
				Naphthalene	9.39E-01	µg/L	1.40E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.00E-05	mg/kg-d	2.00E-02	mg/kg-d	3.00E-03
				Aluminum	1.03E+03	µg/L	1.53E-02	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.58E-02	mg/kg-d	1.00E+00	mg/kg-d	6.58E-02
				Antimony	9.08E-01	µg/L	1.35E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.81E-05	mg/kg-d	4.00E-04	mg/kg-d	1.45E-01
				Arsenic	1.39E+01	µg/L	2.06E-04	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	3.10E-04	8.87E-04	mg/kg-d	3.00E-04	mg/kg-d	2.96E+00
				Barium	5.58E+02	µg/L	8.30E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.57E-02	mg/kg-d	2.00E-01	mg/kg-d	1.78E-01
				Cobalt	6.02E+00	µg/L	8.95E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.85E-04	mg/kg-d	3.00E-04	mg/kg-d	1.28E+00
				Iron	4.11E+03	µg/L	6.12E-02	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.63E-01	mg/kg-d	7.00E-01	mg/kg-d	3.76E-01
				Lead	9.13E+00	µg/L	1.36E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	5.84E-04	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.81E+02	µg/L	5.67E-03	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.44E-02	mg/kg-d	2.40E-02	mg/kg-d	1.02E+00
				Selenium	6.00E+00	µg/L	8.93E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	3.84E-04	mg/kg-d	5.00E-03	mg/kg-d	7.67E-02
				Vanadium	2.42E+01	µg/L	3.60E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.55E-03	mg/kg-d	7.00E-03	mg/kg-d	2.21E-01
				Aroclor-1260 (PCB-1260)	2.00E-01	µg/L	2.98E-06	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	5.96E-06	1.28E-05	mg/kg-d	--	mg/kg-d	NC
				Heptachlor	4.63E-02	µg/L	6.88E-07	mg/kg-d	4.50E+00	(mg/kg-d)$^{-1}$	3.10E-06	2.96E-06	mg/kg-d	5.00E-04	mg/kg-d	5.92E-03
			Exp. Route Total								5.75E-04					7.66E+00
			Dermal	1,1-Dichloroethane	2.14E+02	µg/L	2.47E-04	mg/kg-d	5.70E-03	(mg/kg-d)$^{-1}$	1.41E-06	3.02E-06	mg/kg-d	2.00E-01	mg/kg-d	1.51E-05
				1,2-Dichloroethane	1.41E+00	µg/L	1.02E-06	mg/kg-d	9.10E-02	(mg/kg-d)$^{-1}$	9.27E-08	1.25E-08	mg/kg-d	2.00E-02	mg/kg-d	6.23E-07
				Benzene	1.07E+01	µg/L	2.43E-05	mg/kg-d	5.50E-02	(mg/kg-d)$^{-1}$	1.34E-06	3.01E-07	mg/kg-d	4.00E-03	mg/kg-d	7.52E-05
				Chlorobenzene	2.03E+00	µg/L	1.06E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.27E-07	mg/kg-d	2.00E-02	mg/kg-d	6.34E-06
				Chloroform	5.59E-01	µg/L	7.39E-07	mg/kg-d	3.10E-02	(mg/kg-d)$^{-1}$	2.29E-08	8.86E-09	mg/kg-d	1.00E-02	mg/kg-d	8.86E-07
				cis-1,2-Dichloroethene	9.51E+01	µg/L	1.24E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.52E-06	mg/kg-d	1.00E-02	mg/kg-d	1.52E-04
				Dibromochloromethane	1.00E+00	µg/L	1.10E-06	mg/kg-d	8.40E-02	(mg/kg-d)$^{-1}$	9.27E-08	1.32E-08	mg/kg-d	2.00E-02	mg/kg-d	6.62E-07
				Ethylbenzene	1.98E+00	µg/L	1.75E-05	mg/kg-d	1.10E-02	(mg/kg-d)$^{-1}$	1.93E-07	2.13E-07	mg/kg-d	1.00E-01	mg/kg-d	2.13E-06

TABLE B.7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE RESIDENT
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.'d)	Household Use	Off Site	Dermal	Methylene chloride	1.27E+00	µg/L	7.02E-07	mg/kg-d	7.50E-03	(mg/kg-d)$^{-1}$	5.26E-09	8.67E-09	mg/kg-d	6.00E-02	mg/kg-d	1.45E-07
				Tetrachloroethene	5.44E-01	µg/L	4.71E-06	mg/kg-d	5.40E-01	(mg/kg-d)$^{-1}$	2.54E-06	5.64E-08	mg/kg-d	1.00E-02	mg/kg-d	5.64E-06
				Trichloroethene	8.67E+01	µg/L	2.19E-04	mg/kg-d	5.90E-03	(mg/kg-d)$^{-1}$	1.29E-06	2.62E-06	mg/kg-d	--	mg/kg-d	NC
				Vinyl chloride	1.99E+01	µg/L	1.58E-05	mg/kg-d	7.20E-01	(mg/kg-d)$^{-1}$	1.14E-05	1.96E-07	mg/kg-d	3.00E-03	mg/kg-d	6.54E-05
				Xylenes (total)	2.01E+00	µg/L	1.92E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.34E-07	mg/kg-d	2.00E-01	mg/kg-d	1.17E-06
				2-Methylnaphthalene	1.97E+00	µg/L	3.96E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.75E-07	mg/kg-d	4.00E-03	mg/kg-d	1.19E-04
				bis(2-Ethylhexyl)phthalate	1.63E+00	µg/L	3.66E-05	mg/kg-d	1.40E-02	(mg/kg-d)$^{-1}$	5.12E-07	4.38E-07	mg/kg-d	2.00E-02	mg/kg-d	2.19E-05
				Naphthalene	9.39E-01	µg/L	9.08E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.09E-07	mg/kg-d	2.00E-02	mg/kg-d	5.45E-06
				Aluminum	1.03E+03	µg/L	8.77E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.24E-06	mg/kg-d	1.00E+00	mg/kg-d	1.24E-06
				Antimony	9.08E-01	µg/L	7.74E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.10E-09	mg/kg-d	6.00E-05	mg/kg-d	1.83E-05
				Arsenic	1.39E+01	µg/L	1.18E-06	mg/kg-d	1.50E+00	(mg/kg-d)$^{-1}$	1.77E-06	1.67E-08	mg/kg-d	3.00E-04	mg/kg-d	5.58E-05
				Barium	5.58E+02	µg/L	4.76E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	6.73E-07	mg/kg-d	1.40E-02	mg/kg-d	4.81E-05
				Cobalt	6.02E+00	µg/L	2.05E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.90E-09	mg/kg-d	3.00E-04	mg/kg-d	9.67E-06
				Iron	4.11E+03	µg/L	3.50E-04	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.96E-06	mg/kg-d	7.00E-01	mg/kg-d	7.08E-06
				Lead	9.13E+00	µg/L	7.78E-08	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	1.10E-09	mg/kg-d	--	mg/kg-d	NC
				Manganese	3.81E+02	µg/L	3.25E-05	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	4.59E-07	mg/kg-d	9.60E-04	mg/kg-d	4.79E-04
				Selenium	6.00E+00	µg/L	5.11E-07	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	7.24E-09	mg/kg-d	5.00E-03	mg/kg-d	1.45E-06
				Vanadium	2.42E+01	µg/L	2.06E-06	mg/kg-d	--	(mg/kg-d)$^{-1}$	NC	2.92E-08	mg/kg-d	1.82E-04	mg/kg-d	1.60E-04
				Aroclor-1260 (PCB-1260)	2.00E-01	µg/L	6.42E-04	mg/kg-d	2.00E+00	(mg/kg-d)$^{-1}$	1.28E-03	7.70E-06	mg/kg-d	--	mg/kg-d	NC
				Heptachlor	4.63E-02	µg/L	3.19E-07	mg/kg-d	4.50E+00	(mg/kg-d)$^{-1}$	1.43E-06	3.82E-09	mg/kg-d	5.00E-04	mg/kg-d	7.64E-06
			Exp. Route Total								1.31E-03					1.26E-03
		Exposure Point Total									1.88E-03					7.66E+00
Exposure Medium Total											1.88E-03					7.66E+00
	Household Use to Ambient Air	Off Site	Inhalation	1,1-Dichloroethane	2.14E+02	µg/L	1.22E-03	mg/m^3	1.60E-03	(mg/m^3)$^{-1}$	1.95E-06	4.28E-03	mg/m^3	--	mg/m^3	NC
				1,2-Dichloroethane	1.41E+00	µg/L	8.00E-06	mg/m^3	2.60E-02	(mg/m^3)$^{-1}$	2.08E-07	2.81E-05	mg/m^3	2.40E+00	mg/m^3	1.17E-05
				Benzene	1.07E+01	µg/L	6.08E-05	mg/m^3	7.80E-03	(mg/m^3)$^{-1}$	4.74E-07	2.13E-04	mg/m^3	3.00E-02	mg/m^3	7.12E-03
				Chlorobenzene	2.03E+00	µg/L	1.15E-05	mg/m^3	--	(mg/m^3)$^{-1}$	NC	4.05E-05	mg/m^3	5.00E-02	mg/m^3	8.11E-04
				Chloroform	5.59E-01	µg/L	3.18E-06	mg/m^3	2.30E-02	(mg/m^3)$^{-1}$	7.31E-08	1.12E-05	mg/m^3	9.80E-02	mg/m^3	1.14E-04
				cis-1,2-Dichloroethene	9.51E+01	µg/L	5.41E-04	mg/m^3	--	(mg/m^3)$^{-1}$	NC	1.90E-03	mg/m^3	--	mg/m^3	NC
				Dibromochloromethane	1.00E+00	µg/L	5.68E-06	mg/m^3	2.70E-02	(mg/m^3)$^{-1}$	1.53E-07	2.00E-05	mg/m^3	--	mg/m^3	NC
				Ethylbenzene	1.98E+00	µg/L	1.13E-05	mg/m^3	2.50E-03	(mg/m^3)$^{-1}$	2.82E-08	3.96E-05	mg/m^3	1.00E+00	mg/m^3	3.96E-05
				Methylene chloride	1.27E+00	µg/L	7.20E-06	mg/m^3	4.70E-04	(mg/m^3)$^{-1}$	3.38E-09	2.53E-05	mg/m^3	1.00E+00	mg/m^3	2.53E-05
				Tetrachloroethene	5.44E-01	µg/L	3.09E-06	mg/m^3	5.90E-03	(mg/m^3)$^{-1}$	1.82E-08	1.09E-05	mg/m^3	2.70E-01	mg/m^3	4.02E-05
				Trichloroethene	8.67E+01	µg/L	4.93E-04	mg/m^3	2.00E-03	(mg/m^3)$^{-1}$	9.86E-07	1.73E-03	mg/m^3	--	mg/m^3	NC
				Vinyl chloride	1.99E+01	µg/L	1.13E-04	mg/m^3	4.40E-03	(mg/m^3)$^{-1}$	4.98E-07	3.98E-04	mg/m^3	1.00E-01	mg/m^3	3.98E-03
				Xylenes (total)	2.01E+00	µg/L	1.14E-05	mg/m^3	--	(mg/m^3)$^{-1}$	NC	4.01E-05	mg/m^3	1.00E-01	mg/m^3	4.01E-04

TABLE B.7.4.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE RESIDENT
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater (cont.'d)	Household Use to Ambient Air	Off Site	Inhalation	2-Methylnaphthalene	1.97E+00	µg/L	1.12E-05	mg/m^3	--	(mg/m^3)$^{-1}$	NC	3.93E-05	mg/m^3	--	mg/m^3	NC
				bis(2-Ethylhexyl)phthalate	NA	µg/L	NC	mg/m^3	2.40E-03	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	--	mg/m^3	NC
				Naphthalene	9.39E-01	µg/L	5.34E-06	mg/m^3	3.40E-02	(mg/m^3)$^{-1}$	1.82E-07	1.88E-05	mg/m^3	3.00E-03	mg/m^3	6.25E-03
				Aluminum	NA	µg/L	NC	mg/m^3	--	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	5.00E-03	mg/m^3	NC
				Antimony	NA	µg/L	NC	mg/m^3	--	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	--	mg/m^3	NC
				Arsenic	NA	µg/L	NC	mg/m^3	4.30E+00	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	1.50E-05	mg/m^3	NC
				Barium	NA	µg/L	NC	mg/m^3	--	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	5.00E-04	mg/m^3	NC
				Cobalt	NA	µg/L	NC	mg/m^3	--	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	6.00E-06	mg/m^3	NC
				Iron	NA	µg/L	NC	mg/m^3	--	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	--	mg/m^3	NC
				Lead	NA	µg/L	NC	mg/m^3	--	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	--	mg/m^3	NC
				Manganese	NA	µg/L	NC	mg/m^3	--	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	5.00E-05	mg/m^3	NC
				Selenium	NA	µg/L	NC	mg/m^3	--	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	2.00E-02	mg/m^3	NC
				Vanadium	NA	µg/L	NC	mg/m^3	--	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	--	mg/m^3	NC
				Aroclor-1260 (PCB-1260)	NA	µg/L	NC	mg/m^3	5.70E-01	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	--	mg/m^3	NC
				Heptachlor	NA	µg/L	NC	mg/m^3	1.30E+00	(mg/m^3)$^{-1}$	NC	NC	mg/m^3	--	mg/m^3	NC
			Exp. Route Total								4.57E-06					1.88E-02
		Exposure Point Total									4.57E-06					1.88E-02
	Exposure Medium Total										4.57E-06					1.88E-02
Medium Total											1.89E-03					7.68E+00
							Total of Receptor Risks Across All Media				2.0E-03	Total of Receptor Hazards Across All Media				7.9E+00

Note:
NA = Not Applicable
NC = Not Calculated

TABLE B.7.5.CT

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE INDUSTRIAL/ COMMERCIAL WORKER
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air	Off Site	Inhalation	1,1-Dichloroethane	6.59E+00	µg/m³	1.70E-04	mg/m³	1.60E-03	(mg/m³)⁻¹	2.71E-07	1.32E-03	mg/m³	–	mg/m³	NC
				1,2-Dichloroethane	9.27E-03	µg/m³	2.38E-07	mg/m³	2.60E-02	(mg/m³)⁻¹	6.20E-09	1.85E-06	mg/m³	2.40E+00	mg/m³	7.73E-07
				Benzene	3.53E-01	µg/m³	9.09E-06	mg/m³	7.80E-03	(mg/m³)⁻¹	7.09E-08	7.07E-05	mg/m³	3.00E-02	mg/m³	2.36E-03
				Chlorobenzene	3.35E-02	µg/m³	8.61E-07	mg/m³	–	(mg/m³)⁻¹	NC	6.70E-06	mg/m³	5.00E-02	mg/m³	1.34E-04
				Chloroform	1.47E-02	µg/m³	3.77E-07	mg/m³	2.30E-02	(mg/m³)⁻¹	8.68E-09	2.94E-06	mg/m³	9.80E-02	mg/m³	3.00E-05
				cis-1,2-Dichloroethene	2.07E+00	µg/m³	5.32E-05	mg/m³	–	(mg/m³)⁻¹	NC	4.14E-04	mg/m³	–	mg/m³	NC
				Dibromochloromethane	1.58E-03	µg/m³	4.07E-08	mg/m³	2.70E-02	(mg/m³)⁻¹	1.10E-09	3.17E-07	mg/m³	–	mg/m³	NC
				Ethylbenzene	6.88E-02	µg/m³	1.77E-06	mg/m³	2.50E-03	(mg/m³)⁻¹	4.42E-09	1.38E-05	mg/m³	1.00E+00	mg/m³	1.38E-05
				Methylene chloride	2.04E-02	µg/m³	5.24E-07	mg/m³	4.70E-04	(mg/m³)⁻¹	2.46E-10	4.07E-06	mg/m³	1.00E+00	mg/m³	4.07E-06
				Tetrachloroethene	4.47E-02	µg/m³	1.15E-06	mg/m³	5.90E-03	(mg/m³)⁻¹	6.78E-09	8.93E-06	mg/m³	2.70E-01	mg/m³	3.31E-05
				Trichloroethene	4.69E+00	µg/m³	1.21E-04	mg/m³	2.00E-03	(mg/m³)⁻¹	2.41E-07	9.38E-04	mg/m³	–	mg/m³	NC
				Vinyl chloride	4.80E+00	µg/m³	1.23E-04	mg/m³	4.40E-03	(mg/m³)⁻¹	5.43E-07	9.60E-04	mg/m³	1.00E-01	mg/m³	9.60E-03
				Xylenes (total)	5.69E-02	µg/m³	1.46E-06	mg/m³	–	(mg/m³)⁻¹	NC	1.14E-05	mg/m³	1.00E-01	mg/m³	1.14E-04
				2-Methylnaphthalene	2.27E-03	µg/m³	5.82E-08	mg/m³	–	(mg/m³)⁻¹	NC	4.53E-07	mg/m³	–	mg/m³	NC
				bis(2-Ethylhexyl)phthalate	NA	µg/m³	NC	mg/m³	2.40E-03	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Naphthalene	1.42E-03	µg/m³	3.66E-08	mg/m³	3.40E-02	(mg/m³)⁻¹	1.25E-09	2.85E-07	mg/m³	3.00E-03	mg/m³	9.50E-05
				Aluminum	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-03	mg/m³	NC
				Antimony	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Arsenic	NA	µg/m³	NC	mg/m³	4.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	1.50E-05	mg/m³	NC
				Barium	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-04	mg/m³	NC
				Cobalt	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	6.00E-06	mg/m³	NC
				Iron	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Lead	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Manganese	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-05	mg/m³	NC
				Selenium	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	2.00E-02	mg/m³	NC
				Vanadium	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Aroclor-1260 (PCB-1260)	NA	µg/m³	NC	mg/m³	5.70E-01	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Heptachlor	NA	µg/m³	NC	mg/m³	1.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
			Exp. Route Total								1.15E-06					1.24E-02
		Exposure Point Total									1.15E-06					1.24E-02
	Exposure Medium Total										1.15E-06					1.24E-02
Medium Total											1.15E-06					1.24E-02
							Total of Receptor Risks Across All Media				1.2E-06	Total of Receptor Hazards Across All Media				1.2E-02

Notes:
NC = Not Calculated

TABLE B.7.5.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS FOR CURRENT/ FUTURE OFF SITE INDUSTRIAL/ COMMERCIAL WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemicals of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Indoor Air	Off Site	Inhalation	1,1-Dichloroethane	6.59E+00	µg/m³	5.38E-04	mg/m³	1.60E-03	(mg/m³)⁻¹	8.60E-07	1.51E-03	mg/m³	–	mg/m³	NC
				1,2-Dichloroethane	9.27E-03	µg/m³	7.56E-07	mg/m³	2.60E-02	(mg/m³)⁻¹	1.97E-08	2.12E-06	mg/m³	2.40E+00	mg/m³	8.82E-07
				Benzene	3.53E-01	µg/m³	2.88E-05	mg/m³	7.80E-03	(mg/m³)⁻¹	2.25E-07	8.07E-05	mg/m³	3.00E-02	mg/m³	2.69E-03
				Chlorobenzene	3.35E-02	µg/m³	2.73E-06	mg/m³	–	(mg/m³)⁻¹	NC	7.64E-06	mg/m³	5.00E-02	mg/m³	1.53E-04
				Chloroform	1.47E-02	µg/m³	1.20E-06	mg/m³	2.30E-02	(mg/m³)⁻¹	2.75E-08	3.35E-06	mg/m³	9.80E-02	mg/m³	3.42E-05
				cis-1,2-Dichloroethene	2.07E+00	µg/m³	1.69E-04	mg/m³	–	(mg/m³)⁻¹	NC	4.73E-04	mg/m³	–	mg/m³	NC
				Dibromochloromethane	1.58E-03	µg/m³	1.29E-07	mg/m³	2.70E-02	(mg/m³)⁻¹	3.49E-09	3.62E-07	mg/m³	–	mg/m³	NC
				Ethylbenzene	6.88E-02	µg/m³	5.61E-06	mg/m³	2.50E-03	(mg/m³)⁻¹	1.40E-08	1.57E-05	mg/m³	1.00E+00	mg/m³	1.57E-05
				Methylene chloride	2.04E-02	µg/m³	1.66E-06	mg/m³	4.70E-04	(mg/m³)⁻¹	7.81E-10	4.65E-06	mg/m³	1.00E+00	mg/m³	4.65E-06
				Tetrachloroethene	4.47E-02	µg/m³	3.64E-06	mg/m³	5.90E-03	(mg/m³)⁻¹	2.15E-08	1.02E-05	mg/m³	2.70E-01	mg/m³	3.78E-05
				Trichloroethene	4.69E+00	µg/m³	3.82E-04	mg/m³	2.00E-03	(mg/m³)⁻¹	7.64E-07	1.07E-03	mg/m³	–	mg/m³	NC
				Vinyl chloride	4.80E+00	µg/m³	3.91E-04	mg/m³	4.40E-03	(mg/m³)⁻¹	1.72E-06	1.10E-03	mg/m³	1.00E-01	mg/m³	1.10E-02
				Xylenes (total)	5.69E-02	µg/m³	4.64E-06	mg/m³	–	(mg/m³)⁻¹	NC	1.30E-05	mg/m³	1.00E-01	mg/m³	1.30E-04
				2-Methylnaphthalene	2.27E-03	µg/m³	1.85E-07	mg/m³	–	(mg/m³)⁻¹	NC	5.17E-07	mg/m³	–	mg/m³	NC
				bis(2-Ethylhexyl)phthalate	NA	µg/m³	NC	mg/m³	2.40E-03	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Naphthalene	1.42E-03	µg/m³	1.16E-07	mg/m³	3.40E-02	(mg/m³)⁻¹	3.95E-09	3.25E-07	mg/m³	3.00E-03	mg/m³	1.08E-04
				Aluminum	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-03	mg/m³	NC
				Antimony	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Arsenic	NA	µg/m³	NC	mg/m³	4.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	1.50E-05	mg/m³	NC
				Barium	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-04	mg/m³	NC
				Cobalt	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	6.00E-06	mg/m³	NC
				Iron	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Lead	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Manganese	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	5.00E-05	mg/m³	NC
				Selenium	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	2.00E-02	mg/m³	NC
				Vanadium	NA	µg/m³	NC	mg/m³	–	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Aroclor-1260 (PCB-1260)	NA	µg/m³	NC	mg/m³	5.70E-01	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
				Heptachlor	NA	µg/m³	NC	mg/m³	1.30E+00	(mg/m³)⁻¹	NC	NC	mg/m³	–	mg/m³	NC
			Exp. Route Total								3.66E-06					1.41E-02
		Exposure Point Total									3.66E-06					1.41E-02
	Exposure Medium Total										3.66E-06					1.41E-02
Medium Total											3.66E-06					1.41E-02
							Total of Receptor Risks Across All Media				3.7E-06	Total of Receptor Hazards Across All Media				1.4E-02

Notes:
NC = Not Calculated

TABLE B.9.1.CT

SUMMARY OF CURRENT/ FUTURE ON SITE TRESPASSER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil Gas	Ambient Air	On Site	Benzene	--	7.14E-09	--	7.14E-09	blood system	--	2.14E-04	--	2.14E-04
			Ethylbenzene	--	6.67E-09	--	6.67E-09	liver	--	1.87E-05	--	1.87E-05
			Naphthalene	--	1.05E-09	--	1.05E-09	body weight	--	7.22E-05	--	7.22E-05
			Trichloroethene	--	6.57E-09	--	6.57E-09	--	--	NC	--	NC
			Vinyl chloride	--	1.81E-09	--	1.81E-09	liver	--	2.89E-05	--	2.89E-05
			Chemical Total	--	2.32E-08	--	2.32E-08		--	3.33E-04	--	3.33E-04
		Exposure Point Total					2.32E-08					3.33E-04
	Exposure Medium Total						2.32E-08					3.33E-04
Medium Total							2.32E-08					3.33E-04
Surface Soil	Surface Soil	On Site	Benzo(a)anthracene	5.03E-08	1.78E-13	1.02E-08	6.05E-08	--	NC	NC	NC	NC
			Benzo(a)pyrene	2.57E-07	9.07E-13	5.21E-08	3.09E-07	--	NC	NC	NC	NC
			Benzo(b)fluoranthene	5.93E-08	2.81E-10	1.20E-08	7.15E-08	--	NC	NC	NC	NC
			Benzo(k)fluoranthene	2.30E-09	8.11E-14	4.66E-10	2.76E-09	--	NC	NC	NC	NC
			Dibenz(a,h)anthracene	7.36E-08	2.83E-13	1.49E-08	8.85E-08	--	NC	NC	NC	NC
			Indeno(1,2,3-cd) pyrene	2.13E-08	7.51E-14	4.31E-09	2.56E-08	--	NC	NC	NC	NC
			Aluminum	NC	NC	NC	NC	--	1.13E-03	5.29E-06	1.76E-05	1.15E-03
			Antimony	NC	NC	NC	NC	mortality	1.50E-02	NC	1.57E-03	1.66E-02
			Arsenic	1.69E-06	1.14E-10	7.93E-08	1.77E-06	skin discoloration	2.64E-02	1.24E-05	1.23E-03	2.76E-02
			Barium	NC	NC	NC	NC	kidney	5.09E-03	4.77E-05	1.13E-03	6.27E-03
			Cadmium	NC	7.17E-12	NC	7.17E-12	proteinuria	2.38E-03	2.79E-06	7.42E-05	2.46E-03
			Cobalt	NC	NC	NC	NC	--	5.39E-03	6.32E-06	8.41E-05	5.48E-03
			Copper	NC	NC	NC	NC	gastrointestinal system	3.67E-01	NC	5.73E-03	3.73E-01
			Iron	NC	NC	NC	NC	--	8.36E-03	NC	1.30E-04	8.49E-03
			Lead	NC	NC	NC	NC	--	NC	NC	NC	NC
			Manganese	NC	NC	NC	NC	central nervous system	2.46E-03	2.77E-05	9.61E-04	3.45E-03
			Nickel	NC	3.59E-11	NC	3.59E-11	body weight	2.06E-03	1.07E-05	3.21E-05	2.10E-03
			Vanadium	NC	NC	NC	NC	mortality	8.74E-04	NC	5.24E-04	1.40E-03
			Zinc	NC	NC	NC	NC	blood system	1.07E-03	NC	1.67E-05	1.09E-03
			Aroclor-1248 (PCB-1248)	7.19E-08	4.80E-13	1.57E-08	8.76E-08	--	NC	NC	NC	NC
			Aroclor-1254 (PCB-1254)	3.65E-08	2.44E-13	7.98E-09	4.45E-08	immune system	6.39E-03	NC	1.40E-03	7.79E-03
			Aroclor-1260 (PCB-1260)	2.44E-08	1.63E-13	5.33E-09	2.97E-08	--	NC	NC	NC	NC
			Total TEQ	3.43E-08	2.35E-13	5.36E-09	3.97E-08	--	1.85E-03	1.08E-09	2.88E-04	2.14E-03
			Chemical Total	2.32E-06	4.41E-10	2.08E-07	2.53E-06		4.46E-01	1.13E-04	1.32E-02	4.59E-01
		Exposure Point Total					2.53E-06					4.59E-01
	Exposure Medium Total						2.53E-06					4.59E-01
Medium Total							2.53E-06					4.59E-01

TABLE B.9.1.CT

SUMMARY OF CURRENT/ FUTURE ON SITE TRESPASSER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Sediment	Sediment	On Site	Benzo(a)anthracene	2.41E-08	--	4.89E-09	2.90E-08	--	NC	--	NC	NC
			Benzo(a)pyrene	2.89E-07	--	5.86E-08	3.48E-07	--	NC	--	NC	NC
			Benzo(b)fluoranthene	4.02E-08	--	8.14E-09	4.83E-08	--	NC	--	NC	NC
			Dibenz(a,h)anthracene	7.71E-08	--	1.56E-08	9.27E-08	--	NC	--	NC	NC
			Indeno(1,2,3-cd) pyrene	3.05E-08	--	6.19E-09	3.67E-08	--	NC	--	NC	NC
			Arsenic	4.16E-07	--	1.95E-08	4.35E-07	skin discoloration	6.47E-03	--	3.03E-04	6.77E-03
			Cobalt	NC	--	NC	NC	--	3.44E-03	--	5.37E-05	3.49E-03
			Iron	NC	--	NC	NC	--	2.97E-03	--	4.63E-05	3.02E-03
			Manganese	NC	--	NC	NC	central nervous system	3.50E-03	--	1.36E-03	4.86E-03
			Aroclor-1254 (PCB-1254)	2.90E-08	--	6.34E-09	3.54E-08	immune system	5.08E-03	--	1.11E-03	6.19E-03
			Chemical Total	9.06E-07	--	1.19E-07	1.03E-06		2.15E-02	--	2.88E-03	2.43E-02
		Exposure Point Total					1.03E-06					2.43E-02
	Exposure Medium Total						1.03E-06					2.43E-02
Medium Total							1.03E-06					2.43E-02
				Total Risk Across All Media and All Exposure Routes			**3.6E-06**		**Total Hazard Index Across All Media and All Exposure Routes**			**4.8E-01**

Total Blood System HI Across All Media =	1.30E-03
Total Liver HI Across All Media =	4.75E-05
Total Body Weight HI Across All Media =	2.18E-03
Total Gastrointestinal System HI Across All Media =	3.73E-01
Total Kidney HI Across All Media =	6.27E-03
Total Mortality HI Across All Media =	1.40E-03
Total Skin Discoloration HI Across All Media =	3.44E-02
Total Proteinuria HI Across All Media =	2.46E-03
Total Central Nervous System HI Across All Media =	8.31E-03
Total Immune System HI Across All Media =	1.40E-02

Note:
NC = Not Calculated

TABLE B.9.1.RME

SUMMARY OF CURRENT/ FUTURE ON SITE TRESPASSER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil Gas	Ambient Air	On Site	Benzene	--	2.86E-08	--	2.86E-08	blood system	--	8.55E-04	--	8.55E-04
			Ethylbenzene	--	2.67E-08	--	2.67E-08	liver	--	7.47E-05	--	7.47E-05
			Naphthalene	--	4.21E-09	--	4.21E-09	body weight	--	2.89E-04	--	2.89E-04
			Trichloroethene	--	2.63E-08	--	2.63E-08	--	--	NC	--	NC
			Vinyl chloride	--	7.26E-09	--	7.26E-09	liver	--	1.15E-04	--	1.15E-04
			Chemical Total	--	9.30E-08	--	9.30E-08		--	1.33E-03	--	1.33E-03
		Exposure Point Total					9.30E-08					1.33E-03
	Exposure Medium Total						9.30E-08					1.33E-03
Medium Total							9.30E-08					1.33E-03
Surface Soil	Surface Soil	On Site	Benzo(a)anthracene	1.01E-07	7.10E-13	1.02E-07	2.02E-07	--	NC	NC	NC	NC
			Benzo(a)pyrene	5.13E-07	3.63E-12	5.21E-07	1.03E-06	--	NC	NC	NC	NC
			Benzo(b)fluoranthene	1.19E-07	1.12E-09	1.20E-07	2.40E-07	--	NC	NC	NC	NC
			Benzo(k)fluoranthene	4.59E-09	3.24E-13	4.66E-09	9.25E-09	--	NC	NC	NC	NC
			Dibenz(a,h)anthracene	1.47E-07	1.13E-12	1.49E-07	2.96E-07	--	NC	NC	NC	NC
			Indeno(1,2,3-cd) pyrene	4.25E-08	3.00E-13	4.31E-08	8.57E-08	--	NC	NC	NC	NC
			Aluminum	NC	NC	NC	NC	--	2.26E-03	2.12E-05	1.76E-04	2.45E-03
			Antimony	NC	NC	NC	NC	mortality	3.01E-02	NC	1.57E-02	4.57E-02
			Arsenic	3.39E-06	4.55E-10	7.93E-07	4.18E-06	skin discoloration	5.27E-02	4.94E-05	1.23E-02	6.51E-02
			Barium	NC	NC	NC	NC	kidney	1.02E-02	1.91E-04	1.13E-02	2.17E-02
			Cadmium	NC	2.87E-11	NC	2.87E-11	proteinuria	4.76E-03	1.12E-05	7.42E-04	5.51E-03
			Cobalt	NC	NC	NC	NC	--	1.08E-02	2.53E-05	8.41E-04	1.17E-02
			Copper	NC	NC	NC	NC	gastrointestinal system	7.34E-01	NC	5.73E-02	7.91E-01
			Iron	NC	NC	NC	NC	--	1.67E-02	NC	1.30E-03	1.80E-02
			Lead	NC	NC	NC	NC	--	NC	NC	NC	NC
			Manganese	NC	NC	NC	NC	central nervous system	4.93E-03	1.11E-04	9.61E-03	1.46E-02
			Nickel	NC	1.43E-10	NC	1.43E-10	body weight	4.12E-03	4.29E-05	3.21E-04	4.48E-03
			Vanadium	NC	NC	NC	NC	mortality	1.75E-03	NC	5.24E-03	6.99E-03
			Zinc	NC	NC	NC	NC	blood system	2.14E-03	NC	1.67E-04	2.30E-03
			Aroclor-1248 (PCB-1248)	1.44E-07	1.92E-12	1.57E-07	3.01E-07	--	NC	NC	NC	NC
			Aroclor-1254 (PCB-1254)	7.31E-08	9.76E-13	7.98E-08	1.53E-07	immune system	1.28E-02	NC	1.40E-02	2.67E-02
			Aroclor-1260 (PCB-1260)	4.88E-08	6.51E-13	5.33E-08	1.02E-07	--	NC	NC	NC	NC
			Total TEQ	6.87E-08	9.41E-13	5.36E-08	1.22E-07	--	3.70E-03	4.33E-09	2.88E-03	6.58E-03
			Chemical Total	4.65E-06	1.76E-09	2.08E-06	6.73E-06		8.91E-01	4.52E-04	1.32E-01	1.02E+00
		Exposure Point Total					6.73E-06					1.02E+00
	Exposure Medium Total						6.73E-06					1.02E+00
Medium Total							6.73E-06					1.02E+00

TABLE B.9.1.RME

SUMMARY OF CURRENT/ FUTURE ON SITE TRESPASSER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	On Site	Benzo(a)anthracene	4.82E-08	--	4.89E-08	9.71E-08	--	NC	--	NC	NC
			Benzo(a)pyrene	5.78E-07	--	5.86E-07	1.16E-06	--	NC	--	NC	NC
			Benzo(b)fluoranthene	8.03E-08	--	8.14E-08	1.62E-07	--	NC	--	NC	NC
			Dibenz(a,h)anthracene	1.54E-07	--	1.56E-07	3.11E-07	--	NC	--	NC	NC
			Indeno(1,2,3-cd) pyrene	6.10E-08	--	6.19E-08	1.23E-07	--	NC	--	NC	NC
			Arsenic	8.32E-07	--	1.95E-07	1.03E-06	skin discoloration	1.29E-02	--	3.03E-03	1.60E-02
			Cobalt	NC	--	NC	NC	--	6.88E-03	--	5.37E-04	7.42E-03
			Iron	NC	--	NC	NC	--	5.94E-03	--	4.63E-04	6.40E-03
			Manganese	NC	--	NC	NC	central nervous system	7.00E-03	--	1.36E-02	2.06E-02
			Aroclor-1254 (PCB-1254)	5.81E-08	--	6.34E-08	1.22E-07	immune system	1.02E-02	--	1.11E-02	2.13E-02
			Chemical Total	1.81E-06	--	1.19E-06	3.00E-06		4.29E-02	--	2.88E-02	7.17E-02
		Exposure Point Total					3.00E-06					7.17E-02
	Exposure Medium Total						3.00E-06					7.17E-02
Medium Total							3.00E-06					7.17E-02
				Total Risk Across All Media and All Exposure Routes			9.8E-06	Total Hazard Index Across All Media and All Exposure Routes				1.1E+00

Total Blood System HI Across All Media =	3.16E-03
Total Liver HI Across All Media =	1.90E-04
Total Body Weight HI Across All Media =	4.77E-03
Total Gastrointestinal System HI Across All Media =	7.91E-01
Total Kidney HI Across All Media =	2.17E-02
Total Mortality HI Across All Media =	6.99E-03
Total Skin Discoloration HI Across All Media =	8.11E-02
Total Proteinuria HI Across All Media =	5.51E-03
Total Central Nervous System HI Across All Media =	3.53E-02
Total Immune System HI Across All Media =	4.80E-02

Note:
NC = Not Calculated

TABLE B.9.2.CT

SUMMARY OF CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil Gas	Indoor Air	On Site	1,1-Dichloroethane	–	4.54E-08	–	4.54E-08	–	–	NC	–	NC
			1,1-Dichloroethene	–	NC	–	NC	liver	–	6.21E-05	–	6.21E-05
			1,4-Dichlorobenzene	–	5.51E-10	–	5.51E-10	liver	–	4.87E-07	–	4.87E-07
			Benzene	–	1.49E-06	–	1.49E-06	blood system	–	4.94E-02	–	4.94E-02
			Bromomethane	–	NC	–	NC	gastrointestinal system	–	3.19E-04	–	3.19E-04
			Chlorobenzene	–	NC	–	NC	–	–	2.55E-02	–	2.55E-02
			Chloroethane	–	NC	–	NC	developmental effects	–	5.87E-06	–	5.87E-06
			Chloroform	–	1.94E-08	–	1.94E-08	–	–	6.70E-05	–	6.70E-05
			cis-1,2-Dichloroethene	–	NC	–	NC	–	–	NC	–	NC
			Cyclohexane	–	NC	–	NC	developmental effects	–	8.73E-04	–	8.73E-04
			Dichlorodifluoromethane	–	NC	–	NC	body weight	–	6.81E-04	–	6.81E-04
			Ethylbenzene	–	1.54E-06	–	1.54E-06	liver	–	4.80E-03	–	4.80E-03
			Isopropylbenzene	–	NC	–	NC	kidney	–	1.84E-03	–	1.84E-03
			Methyl Tert Butyl Ether	–	2.67E-10	–	2.67E-10	organ weights	–	2.66E-06	–	2.66E-06
			Methylene chloride	–	1.40E-10	–	1.40E-10	–	–	2.32E-06	–	2.32E-06
			Naphthalene	–	2.82E-07	–	2.82E-07	body weight	–	2.15E-02	–	2.15E-02
			Tetrachloroethene	–	1.78E-08	–	1.78E-08	–	–	8.69E-05	–	8.69E-05
			Toluene	–	NC	–	NC	kidney	–	6.10E-05	–	6.10E-05
			trans-1,2-Dichloroethene	–	NC	–	NC	–	–	6.79E-04	–	6.79E-04
			Trichloroethene	–	1.47E-06	–	1.47E-06	–	–	NC	–	NC
			Trichlorofluoromethane	–	NC	–	NC	mortality	–	5.45E-06	–	5.45E-06
			Vinyl chloride	–	3.32E-07	–	3.32E-07	liver	–	5.87E-03	–	5.87E-03
			Xylenes (total)	–	NC	–	NC	body weight	–	4.89E-02	–	4.89E-02
			Chemical Total	–	5.20E-06	–	5.20E-06		–	1.61E-01	–	1.61E-01
		Exposure Point Total					5.20E-06					1.61E-01
	Exposure Medium Total						5.20E-06					1.61E-01
Medium Total							5.20E-06					1.61E-01
Soil Gas	Ambient Air	On Site	Benzene	–	2.62E-07	–	2.62E-07	blood system	–	8.70E-03	–	8.70E-03
			Ethylbenzene	–	2.45E-07	–	2.45E-07	liver	–	7.61E-04	–	7.61E-04
			Naphthalene	–	3.86E-08	–	3.86E-08	body weight	–	2.94E-03	–	2.94E-03
			Trichloroethene	–	2.41E-07	–	2.41E-07	–	–	NC	–	NC
			Vinyl chloride	–	6.65E-08	–	6.65E-08	liver	–	1.18E-03	–	1.18E-03
			Chemical Total	–	8.52E-07	–	8.52E-07		–	1.36E-02	–	1.36E-02
		Exposure Point Total					8.52E-07					1.36E-02
	Exposure Medium Total						8.52E-07					1.36E-02
Medium Total							8.52E-07					1.36E-02

TABLE B.9.2.CT

SUMMARY OF CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/Commercial Worker
Receptor Age: Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Surface Soil	Surface Soil	On Site	Benzo(a)anthracene	2.52E-07	6.51E-12	2.16E-08	2.73E-07	--	NC	NC	NC	NC
			Benzo(a)pyrene	1.29E-06	3.32E-11	1.10E-07	1.40E-06	--	NC	NC	NC	NC
			Benzo(b)fluoranthene	2.97E-07	6.52E-09	2.55E-08	3.29E-07	--	NC	NC	NC	NC
			Benzo(k)fluoranthene	1.15E-08	2.97E-12	9.86E-10	1.25E-08	--	NC	NC	NC	NC
			Dibenz(a,h)anthracene	3.68E-07	1.04E-11	3.16E-08	4.00E-07	--	NC	NC	NC	NC
			Indeno(1,2,3-cd) pyrene	1.06E-07	2.75E-12	9.14E-09	1.16E-07	--	NC	NC	NC	NC
			Aluminum	NC	NC	NC	NC	--	6.28E-03	2.15E-04	4.14E-05	6.53E-03
			Antimony	NC	NC	NC	NC	mortality	8.37E-02	NC	3.68E-03	8.74E-02
			Arsenic	8.49E-06	4.17E-09	1.68E-07	8.66E-06	skin discoloration	1.47E-01	5.03E-04	2.90E-03	1.50E-01
			Barium	NC	NC	NC	NC	kidney	2.83E-02	1.94E-03	2.67E-03	3.29E-02
			Cadmium	NC	2.63E-10	NC	2.63E-10	proteinuria	1.32E-02	1.14E-04	1.75E-04	1.35E-02
			Cobalt	NC	NC	NC	NC	--	3.00E-02	2.57E-04	1.98E-04	3.05E-02
			Copper	NC	NC	NC	NC	gastrointestinal system	2.04E+00	NC	1.35E-02	2.06E+00
			Iron	NC	NC	NC	NC	--	4.65E-02	NC	3.07E-04	4.68E-02
			Lead	NC	NC	NC	NC	--	NC	NC	NC	NC
			Manganese	NC	NC	NC	NC	central nervous system	1.37E-02	1.13E-03	2.26E-03	1.71E-02
			Nickel	NC	1.31E-09	NC	1.31E-09	body weight	1.15E-02	4.37E-04	7.57E-05	1.20E-02
			Vanadium	NC	NC	NC	NC	mortality	4.86E-03	NC	1.23E-03	6.10E-03
			Zinc	NC	NC	NC	NC	blood system	5.95E-03	NC	3.93E-05	5.99E-03
			Aroclor-1248 (PCB-1248)	3.60E-07	1.76E-11	3.33E-08	3.93E-07	--	NC	NC	NC	NC
			Aroclor-1254 (PCB-1254)	1.83E-07	8.95E-12	1.69E-08	2.00E-07	immune system	3.56E-02	NC	3.29E-03	3.89E-02
			Aroclor-1260 (PCB-1260)	1.22E-07	5.97E-12	1.13E-08	1.33E-07	--	NC	NC	NC	NC
			Total TEQ	1.72E-07	8.62E-12	1.13E-08	1.83E-07	--	1.03E-02	4.41E-08	6.79E-04	1.10E-02
			Chemical Total	1.16E-05	1.24E-08	4.40E-07	1.21E-05		2.48E+00	4.60E-03	3.10E-02	2.51E+00
		Exposure Point Total					1.21E-05					2.51E+00
	Exposure Medium Total						1.21E-05					2.51E+00
Medium Total							1.21E-05					2.51E+00

TABLE B.9.2.CT

SUMMARY OF CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/ Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	On Site	Benzo(a)anthracene	1.21E-07	--	1.04E-08	1.31E-07	--	NC	--	NC	NC
			Benzo(a)pyrene	1.45E-06	--	1.24E-07	1.57E-06	--	NC	--	NC	NC
			Benzo(b)fluoranthene	2.01E-07	--	1.73E-08	2.18E-07	--	NC	--	NC	NC
			Dibenz(a,h)anthracene	3.86E-07	--	3.31E-08	4.19E-07	--	NC	--	NC	NC
			Indeno(1,2,3-cd) pyrene	1.53E-07	--	1.31E-08	1.66E-07	--	NC	--	NC	NC
			Arsenic	2.08E-06	--	4.12E-08	2.12E-06	skin discoloration	3.60E-02	--	7.13E-04	3.67E-02
			Cobalt	NC	--	NC	NC	--	1.91E-02	--	1.26E-04	1.93E-02
			Iron	NC	--	NC	NC	--	1.65E-02	--	1.09E-04	1.66E-02
			Manganese	NC	--	NC	NC	central nervous system	1.95E-02	--	3.21E-03	2.27E-02
			Aroclor-1254 (PCB-1254)	1.45E-07	--	1.34E-08	1.59E-07	immune system	2.83E-02	--	2.61E-03	3.09E-02
			Chemical Total	4.54E-06	--	2.53E-07	4.79E-06		1.19E-01	--	6.77E-03	1.26E-01
		Exposure Point Total					4.79E-06					1.26E-01
	Exposure Medium Total						4.79E-06					1.26E-01
Medium Total							4.79E-06					1.26E-01
				Total Risk Across All Media and All Exposure Routes			2.3E-05	Total Hazard Index Across All Media and All Exposure Routes				2.8E+00

Total Liver HI Across All Media =	1.27E-02
Total Blood System HI Across All Media =	6.41E-02
Total Gastrointestinal System HI Across All Media =	2.06E+00
Total Developmental Effects HI Across All Media =	8.79E-04
Total Body Weight HI Across All Media =	3.71E-02
Total Kidney HI Across All Media =	3.48E-02
Total Organ Weights HI Across All Media =	2.66E-06
Total Mortality HI Across All Media =	6.10E-03
Total Skin Discoloration HI Across All Media =	1.87E-01
Total Proteinuria HI Across All Media =	1.35E-02
Total Central Nervous System HI Across All Media =	3.98E-02
Total Immune System HI Across All Media =	6.98E-02

Note:
NC = Not Calculated

TABLE B.9.2.RME

SUMMARY OF CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil Gas	Indoor Air	On Site	1,1-Dichloroethane	--	1.44E-07	--	1.44E-07	--	--	NC	--	NC
			1,1-Dichloroethene	--	NC	--	NC	liver	--	7.09E-05	--	7.09E-05
			1,4-Dichlorobenzene	--	1.75E-09	--	1.75E-09	liver	--	5.56E-07	--	5.56E-07
			Benzene	--	4.71E-06	--	4.71E-06	blood system	--	5.64E-02	--	5.64E-02
			Bromomethane	--	NC	--	NC	gastrointestinal system	--	3.64E-04	--	3.64E-04
			Chlorobenzene	--	NC	--	NC	--	--	2.91E-02	--	2.91E-02
			Chloroethane	--	NC	--	NC	developmental effects	--	6.70E-06	--	6.70E-06
			Chloroform	--	6.16E-08	--	6.16E-08	--	--	7.65E-05	--	7.65E-05
			cis-1,2-Dichloroethene	--	NC	--	NC	--	--	NC	--	NC
			Cyclohexane	--	NC	--	NC	developmental effects	--	9.96E-04	--	9.96E-04
			Dichlorodifluoromethane	--	NC	--	NC	body weight	--	7.77E-04	--	7.77E-04
			Ethylbenzene	--	4.89E-06	--	4.89E-06	liver	--	5.48E-03	--	5.48E-03
			Isopropylbenzene	--	NC	--	NC	kidney	--	2.10E-03	--	2.10E-03
			Methyl Tert Butyl Ether	--	8.46E-10	--	8.46E-10	organ weights	--	3.04E-06	--	3.04E-06
			Methylene chloride	--	4.44E-10	--	4.44E-10	--	--	2.64E-06	--	2.64E-06
			Naphthalene	--	8.94E-07	--	8.94E-07	body weight	--	2.45E-02	--	2.45E-02
			Tetrachloroethene	--	5.64E-08	--	5.64E-08	--	--	9.92E-05	--	9.92E-05
			Toluene	--	NC	--	NC	kidney	--	6.96E-05	--	6.96E-05
			trans-1,2-Dichloroethene	--	NC	--	NC	--	--	7.76E-04	--	7.76E-04
			Trichloroethene	--	4.66E-06	--	4.66E-06	--	--	NC	--	NC
			Trichlorofluoromethane	--	NC	--	NC	mortality	--	6.23E-06	--	6.23E-06
			Vinyl chloride	--	1.05E-06	--	1.05E-06	liver	--	6.70E-03	--	6.70E-03
			Xylenes (total)	--	NC	--	NC	body weight	--	5.58E-02	--	5.58E-02
			Chemical Total	--	1.65E-05	--	1.65E-05		--	1.83E-01	--	1.83E-01
		Exposure Point Total					1.65E-05					1.83E-01
	Exposure Medium Total						1.65E-05					1.83E-01
Medium Total							1.65E-05					1.83E-01
Soil Gas	Ambient Air	On Site	Benzene	--	8.30E-07	--	8.30E-07	blood system	--	9.94E-03	--	9.94E-03
			Ethylbenzene	--	7.75E-07	--	7.75E-07	liver	--	8.69E-04	--	8.69E-04
			Naphthalene	--	1.22E-07	--	1.22E-07	body weight	--	3.36E-03	--	3.36E-03
			Trichloroethene	--	7.64E-07	--	7.64E-07	--	--	NC	--	NC
			Vinyl chloride	--	2.11E-07	--	2.11E-07	liver	--	1.34E-03	--	1.34E-03
			Chemical Total	--	2.70E-06	--	2.70E-06		--	1.55E-02	--	1.55E-02
		Exposure Point Total					2.70E-06					1.55E-02
	Exposure Medium Total						2.70E-06					1.55E-02
Medium Total							2.70E-06					1.55E-02

TABLE B.9.2.RME

SUMMARY OF CURRENT/FUTURE ON SITE INDUSTRIAL/COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	On Site	Benzo(a)anthracene	7.98E-07	2.06E-11	6.85E-07	1.48E-06	--	NC	NC	NC	NC
			Benzo(a)pyrene	4.08E-06	1.05E-10	3.50E-06	7.57E-06	--	NC	NC	NC	NC
			Benzo(b)fluoranthene	9.41E-07	2.07E-08	8.07E-07	1.77E-06	--	NC	NC	NC	NC
			Benzo(k)fluoranthene	3.65E-08	9.43E-12	3.13E-08	6.77E-08	--	NC	NC	NC	NC
			Dibenz(a,h)anthracene	1.17E-06	3.29E-11	1.00E-06	2.17E-06	--	NC	NC	NC	NC
			Indeno(1,2,3-cd) pyrene	3.38E-07	8.73E-12	2.90E-07	6.27E-07	--	NC	NC	NC	NC
			Aluminum	NC	NC	NC	NC	--	7.17E-03	2.46E-04	4.73E-04	7.89E-03
			Antimony	NC	NC	NC	NC	mortality	9.56E-02	NC	4.21E-02	1.38E-01
			Arsenic	2.69E-05	1.32E-08	5.33E-06	3.22E-05	skin discoloration	1.67E-01	5.74E-04	3.31E-02	2.01E-01
			Barium	NC	NC	NC	NC	kidney	3.23E-02	2.22E-03	3.05E-02	6.50E-02
			Cadmium	NC	8.33E-10	NC	8.33E-10	proteinuria	1.51E-02	1.30E-04	1.99E-03	1.72E-02
			Cobalt	NC	NC	NC	NC	--	3.43E-02	2.94E-04	2.26E-03	3.68E-02
			Copper	NC	NC	NC	NC	gastrointestinal system	2.33E+00	NC	1.54E-01	2.49E+00
			Iron	NC	NC	NC	NC	--	5.31E-02	NC	3.50E-03	5.66E-02
			Lead	NC	NC	NC	NC	--	NC	NC	NC	NC
			Manganese	NC	NC	NC	NC	central nervous system	1.56E-02	1.29E-03	2.58E-02	4.28E-02
			Nickel	NC	4.17E-09	NC	4.17E-09	body weight	1.31E-02	4.99E-04	8.64E-04	1.44E-02
			Vanadium	NC	NC	NC	NC	mortality	5.55E-03	NC	1.41E-02	1.96E-02
			Zinc	NC	NC	NC	NC	blood system	6.79E-03	NC	4.48E-04	7.24E-03
			Aroclor-1248 (PCB-1248)	1.14E-06	5.58E-11	1.05E-06	2.20E-06	--	NC	NC	NC	NC
			Aroclor-1254 (PCB-1254)	5.80E-07	2.84E-11	5.36E-07	1.12E-06	immune system	4.06E-02	NC	3.75E-02	7.81E-02
			Aroclor-1260 (PCB-1260)	3.87E-07	1.89E-11	3.58E-07	7.45E-07	--	NC	NC	NC	NC
			Total TEQ	5.45E-07	2.73E-11	3.60E-07	9.05E-07	--	1.17E-02	5.04E-08	7.75E-03	1.95E-02
			Chemical Total	3.69E-05	3.92E-08	1.39E-05	5.09E-05		2.83E+00	5.25E-03	3.54E-01	3.19E+00
		Exposure Point Total					5.09E-05					3.19E+00
	Exposure Medium Total						5.09E-05					3.19E+00
Medium Total							5.09E-05					3.19E+00

TABLE B.9.2.RME

SUMMARY OF CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	On Site	Benzo(a)anthracene	3.83E-07	--	3.28E-07	7.11E-07	--	NC	--	NC	NC
			Benzo(a)pyrene	4.59E-06	--	3.94E-06	8.53E-06	--	NC	--	NC	NC
			Benzo(b)fluoranthene	6.38E-07	--	5.47E-07	1.18E-06	--	NC	--	NC	NC
			Dibenz(a,h)anthracene	1.22E-06	--	1.05E-06	2.28E-06	--	NC	--	NC	NC
			Indeno(1,2,3-cd) pyrene	4.85E-07	--	4.16E-07	9.01E-07	--	NC	--	NC	NC
			Arsenic	6.60E-06	--	1.31E-06	7.91E-06	skin discoloration	4.11E-02	--	8.14E-03	4.92E-02
			Cobalt	NC	--	NC	NC	--	2.19E-02	--	1.44E-03	2.33E-02
			Iron	NC	--	NC	NC	--	1.89E-02	--	1.25E-03	2.01E-02
			Manganese	NC	--	NC	NC	central nervous system	2.22E-02	--	3.67E-02	5.89E-02
			Aroclor-1254 (PCB-1254)	4.61E-07	--	4.26E-07	8.88E-07	immune system	3.23E-02	--	2.98E-02	6.21E-02
			Chemical Total	1.44E-05	--	8.02E-06	2.24E-05		1.36E-01	--	7.73E-02	2.14E-01
		Exposure Point Total					2.24E-05					2.14E-01
	Exposure Medium Total						2.24E-05					2.14E-01
Medium Total							2.24E-05					2.14E-01
				Total Risk Across All Media and All Exposure Routes			9.2E-05	Total Hazard Index Across All Media and All Exposure Routes				3.6E+00

Total Liver HI Across All Media =	1.45E-02
Total Blood System HI Across All Media =	7.36E-02
Total Gastrointestinal System HI Across All Media =	2.49E+00
Total Developmental Effects HI Across All Media =	1.00E-03
Total Body Weight HI Across All Media =	4.31E-02
Total Kidney HI Across All Media =	6.72E-02
Total Organ Weights HI Across All Media =	3.04E-06
Total Mortality HI Across All Media =	1.96E-02
Total Skin Discoloration HI Across All Media =	2.50E-01
Total Proteinuria HI Across All Media =	1.72E-02
Total Central Nervous System HI Across All Media =	1.02E-01
Total Immune System HI Across All Media =	1.40E-01

Note:
NC = Not Calculated

TABLE B.9.3.CT

SUMMARY OF FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil Gas	Ambient Air	On Site	Benzene	--	4.43E-11	--	4.43E-11	blood system	--	1.32E-05	--	1.32E-05
			Ethylbenzene	--	4.14E-11	--	4.14E-11	liver	--	1.16E-06	--	1.16E-06
			Naphthalene	--	6.53E-12	--	6.53E-12	body weight	--	4.48E-06	--	4.48E-06
			Trichloroethene	--	4.07E-11	--	4.07E-11	--	--	NC	--	NC
			Vinyl chloride	--	1.13E-11	--	1.13E-11	liver	--	1.79E-06	--	1.79E-06
			Chemical Total	--	1.44E-10	--	1.44E-10		--	2.07E-05	--	2.07E-05
		Exposure Point Total					1.44E-10					2.07E-05
	Exposure Medium Total						1.44E-10					2.07E-05
Medium Total							1.44E-10					2.07E-05
Surface and Subsurface Soil	Soil	On Site	Benzene	3.21E-10	NC	1.60E-13	3.21E-10	blood system	1.02E-04	NC	5.10E-08	1.02E-04
			Ethylbenzene	1.05E-09	NC	3.15E-11	1.08E-09	liver	6.68E-05	NC	2.00E-06	6.88E-05
			Tetrachloroethene	1.14E-09	NC	3.41E-11	1.17E-09	liver	1.47E-05	NC	4.41E-07	1.52E-05
			Vinyl chloride	1.05E-09	NC	5.25E-13	1.05E-09	liver	3.40E-05	NC	1.70E-08	3.40E-05
			Xylenes (total)	NC	NC	NC	NC	body weight	1.83E-04	NC	5.49E-06	1.88E-04
			Benzo(a)anthracene	1.56E-08	1.80E-11	2.03E-09	1.77E-08	--	NC	1.15E-07	NC	1.15E-07
			Benzo(a)pyrene	1.16E-07	1.34E-10	1.51E-08	1.32E-07	--	NC	NC	NC	NC
			Benzo(b)fluoranthene	1.80E-08	6.96E-10	2.34E-09	2.10E-08	--	NC	NC	NC	NC
			Benzo(k)fluoranthene	9.39E-10	1.08E-11	1.22E-10	1.07E-09	--	NC	NC	NC	NC
			Dibenz(a,h)anthracene	1.30E-08	1.63E-11	1.69E-09	1.47E-08	--	NC	NC	NC	NC
			Indeno(1,2,3-cd) pyrene	4.82E-09	5.57E-12	6.27E-10	5.45E-09	--	NC	NC	NC	NC
			Naphthalene	NC	NC	NC	NC	body weight	5.96E-05	NC	7.75E-06	6.74E-05
			Aluminum	NC	NC	NC	NC	--	5.20E-03	7.96E-03	5.20E-05	1.32E-02
			Antimony	NC	NC	NC	NC	mortality	1.64E-01	NC	1.09E-02	1.75E-01
			Arsenic	3.68E-07	8.09E-09	1.11E-08	3.88E-07	skin discoloration	5.73E-02	8.78E-03	1.72E-03	6.78E-02
			Barium	NC	NC	NC	NC	kidney	3.04E-03	9.31E-03	4.34E-04	1.28E-02

TABLE B.9.3.CT

SUMMARY OF FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface and Subsurface Soil (cont.'d)	Soil	On Site	Cadmium	NC	1.74E-09	NC	1.74E-09	proteinuria	1.77E-02	6.78E-03	3.54E-04	2.48E-02
			Cobalt	NC	NC	NC	NC	--	7.30E-02	2.80E-02	7.30E-04	1.02E-01
			Copper	NC	NC	NC	NC	gastrointestinal system	5.75E-01	NC	5.75E-03	5.80E-01
			Iron	NC	NC	NC	NC	--	5.01E-02	NC	5.01E-04	5.06E-02
			Lead	NC	NC	NC	NC	--	NC	NC	NC	NC
			Manganese	NC	NC	NC	NC	central nervous system	1.64E-02	6.03E-02	4.10E-03	8.08E-02
			Mercury	NC	NC	NC	NC	--	6.10E-03	1.14E-01	6.10E-05	1.20E-01
			Nickel	NC	2.76E-09	NC	2.76E-09	body weight	4.84E-03	8.24E-03	4.84E-05	1.31E-02
			Vanadium	NC	NC	NC	NC	mortality	3.02E-03	NC	1.16E-03	4.18E-03
			Zinc	NC	NC	NC	NC	blood system	9.62E-03	NC	9.62E-05	9.71E-03
			Aroclor-1248 (PCB-1248)	1.09E-08	2.37E-11	1.52E-09	1.24E-08	--	NC	NC	NC	NC
			Aroclor-1254 (PCB-1254)	4.00E-08	8.74E-11	5.60E-09	4.57E-08	immune system	7.01E-02	NC	9.81E-03	7.99E-02
			Aroclor-1260 (PCB-1260)	5.09E-09	1.11E-11	7.13E-10	5.82E-09	--	NC	NC	NC	NC
			Dieldrin	5.57E-09	1.23E-11	5.57E-10	6.14E-09	liver	4.88E-04	NC	4.88E-05	5.37E-04
			Total TEQ	1.73E-08	3.87E-11	1.73E-09	1.90E-08	--	9.30E-03	1.78E-06	9.30E-04	1.02E-02
			Chemical Total	6.19E-07	1.36E-08	4.32E-08	6.76E-07		1.06E+00	2.43E-01	3.67E-02	1.34E+00
		Exposure Point Total					6.76E-07					1.34E+00
	Exposure Medium Total						6.76E-07					1.34E+00
Medium Total							6.76E-07					1.34E+00

TABLE B.9.3.CT

SUMMARY OF FUTURE ON SITE CONSTRUCTION/ UTILITY WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Sediment	Sediment	On Site	Benzo(a)anthracene	1.21E-08	–	1.58E-10	1.23E-08	–	NC	–	NC	NC
			Benzo(a)pyrene	1.45E-07	–	1.89E-09	1.47E-07	–	NC	–	NC	NC
			Benzo(b)fluoranthene	2.02E-08	–	2.63E-10	2.05E-08	–	NC	–	NC	NC
			Dibenz(a,h)anthracene	3.88E-08	–	5.04E-10	3.93E-08	–	NC	–	NC	NC
			Indeno(1,2,3-cd) pyrene	1.54E-08	–	2.00E-10	1.56E-08	–	NC	–	NC	NC
			Arsenic	2.09E-07	–	6.28E-10	2.10E-07	skin discoloration	3.25E-02	–	9.76E-04	3.35E-02
			Cobalt	NC	–	NC	NC	–	1.73E-02	–	1.73E-04	1.75E-02
			Iron	NC	–	NC	NC	–	1.49E-02	–	1.49E-04	1.51E-02
			Manganese	NC	–	NC	NC	central nervous system	1.76E-02	–	4.40E-03	2.20E-02
			Aroclor-1254 (PCB-1254)	1.46E-08	–	2.05E-10	1.48E-08	immune system	2.56E-02	–	3.58E-03	2.92E-02
			Chemical Total	4.56E-07	–	3.85E-09	4.60E-07		1.08E-01	–	9.28E-03	1.17E-01
		Exposure Point Total					4.60E-07					1.17E-01
	Exposure Medium Total						4.60E-07					1.17E-01
Medium Total							4.60E-07					1.17E-01
				Total Risk Across All Media and All Exposure Routes			1.1E-06		Total Hazard Index Across All Media and All Exposure Routes			1.5E+00

Total Blood System HI Across All Media =	9.83E-03
Total Liver HI Across All Media =	6.57E-04
Total Body Weight HI Across All Media =	1.34E-02
Total Gastrointestinal System HI Across All Media =	5.80E-01
Total Kidney HI Across All Media =	1.28E-02
Total Mortality HI Across All Media =	4.18E-03
Total Skin Discoloration HI Across All Media =	1.01E-01
Total Proteinuria HI Across All Media =	2.48E-02
Total Central Nervous System HI Across All Media =	1.03E-01
Total Immune System HI Across All Media =	1.09E-01

Note:
NC = Not Calculated

TABLE B.9.3.RME

SUMMARY OF FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On-Site Construction/ Utility Worker
Receptor Age: Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Soil Gas	Ambient Air	On-Site	Benzene	--	8.86E-11	--	8.86E-11	blood system	--	2.65E-05	--	2.65E-05
			Ethylbenzene	--	8.27E-11	--	8.27E-11	liver	--	2.32E-06	--	2.32E-06
			Naphthalene	--	1.31E-11	--	1.31E-11	body weight	--	8.96E-06	--	8.96E-06
			Trichloroethene	--	8.15E-11	--	8.15E-11	--	--	NC	--	NC
			Vinyl chloride	--	2.25E-11	--	2.25E-11	liver	--	3.58E-06	--	3.58E-06
			Chemical Total	--	2.88E-10	--	2.88E-10		--	4.14E-05	--	4.14E-05
		Exposure Point Total					2.88E-10					4.14E-05
	Exposure Medium Total						2.88E-10					4.14E-05
Medium Total							2.88E-10					4.14E-05
Surface and Subsurface Soil	Soil	On-Site	Benzene	6.42E-10	NC	9.62E-13	6.43E-10	blood system	2.04E-04	NC	3.06E-07	2.04E-04
			Ethylbenzene	2.10E-09	NC	1.89E-10	2.29E-09	liver	1.34E-04	NC	1.20E-05	1.46E-04
			Tetrachloroethene	2.27E-09	NC	2.04E-10	2.47E-09	liver	2.94E-05	NC	2.65E-06	3.21E-05
			Vinyl chloride	2.10E-09	NC	3.15E-12	2.10E-09	liver	6.81E-05	NC	1.02E-07	6.82E-05
			Xylenes (total)	NC	NC	NC	NC	body weight	3.66E-04	NC	3.29E-05	3.99E-04
			Benzo(a)anthracene	3.12E-08	3.60E-11	1.22E-08	4.34E-08	--	NC	2.29E-07	NC	2.29E-07
			Benzo(a)pyrene	2.33E-07	2.69E-10	9.08E-08	3.24E-07	--	NC	NC	NC	NC
			Benzo(b)fluoranthene	3.60E-08	1.39E-09	1.40E-08	5.14E-08	--	NC	NC	NC	NC
			Benzo(k)fluoranthene	1.88E-09	2.17E-11	7.32E-10	2.63E-09	--	NC	NC	NC	NC
			Dibenz(a,h)anthracene	2.59E-08	3.26E-11	1.01E-08	3.61E-08	--	NC	NC	NC	NC
			Indeno(1,2,3-cd) pyrene	9.64E-09	1.11E-11	3.76E-09	1.34E-08	--	NC	NC	NC	NC
			Naphthalene	NC	NC	NC	NC	body weight	1.19E-04	NC	4.65E-05	1.66E-04
			Aluminum	NC	NC	NC	NC	--	1.04E-02	1.59E-02	3.12E-04	2.66E-02
			Antimony	NC	NC	NC	NC	mortality	3.27E-01	NC	6.54E-02	3.93E-01
			Arsenic	7.37E-07	1.62E-08	6.63E-08	8.19E-07	skin discoloration	1.15E-01	1.76E-02	1.03E-02	1.42E-01
			Barium	NC	NC	NC	NC	kidney	6.08E-03	1.86E-02	2.61E-03	2.73E-02

TABLE B.9.3.RME

SUMMARY OF FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On-Site Construction/ Utility Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface and Subsurface Soil (cont.'d)	Soil	On-Site	Cadmium	NC	3.48E-09	NC	3.48E-09	proteinuria	3.54E-02	1.36E-02	2.12E-03	5.11E-02
			Cobalt	NC	NC	NC	NC	–	1.46E-01	5.59E-02	4.38E-03	2.06E-01
			Copper	NC	NC	NC	NC	gastrointestinal system	1.15E+00	NC	3.45E-02	1.18E+00
			Iron	NC	NC	NC	NC	–	1.00E-01	NC	3.01E-03	1.03E-01
			Lead	NC	NC	NC	NC	–	NC	NC	NC	NC
			Manganese	NC	NC	NC	NC	central nervous system	3.28E-02	1.21E-01	2.46E-02	1.78E-01
			Mercury	NC	NC	NC	NC	–	1.22E-02	2.28E-01	3.66E-04	2.40E-01
			Nickel	NC	5.51E-09	NC	5.51E-09	body weight	9.69E-03	1.65E-02	2.91E-04	2.65E-02
			Vanadium	NC	NC	NC	NC	mortality	6.04E-03	NC	6.97E-03	1.30E-02
			Zinc	NC	NC	NC	NC	blood system	1.92E-02	NC	5.77E-04	1.98E-02
			Aroclor-1248 (PCB-1248)	2.17E-08	4.75E-11	9.13E-09	3.09E-08	–	NC	NC	NC	NC
			Aroclor-1254 (PCB-1254)	8.01E-08	1.75E-10	3.36E-08	1.14E-07	immune system	1.40E-01	NC	5.88E-02	1.99E-01
			Aroclor-1260 (PCB-1260)	1.02E-08	2.22E-11	4.28E-09	1.45E-08	–	NC	NC	NC	NC
			Dieldrin	1.11E-08	2.46E-11	3.34E-09	1.45E-08	liver	9.75E-04	NC	2.93E-04	1.27E-03
			Total TEQ	3.45E-08	7.73E-11	1.04E-08	4.50E-08	–	1.86E-02	3.56E-06	5.58E-03	2.42E-02
			Chemical Total	1.24E-06	2.73E-08	2.59E-07	1.53E-06		2.13E+00	4.87E-01	2.20E-01	2.84E+00
		Exposure Point Total					1.53E-06					2.84E+00
	Exposure Medium Total						1.53E-06					2.84E+00
Medium Total							1.53E-06					2.84E+00

TABLE B.9.3.RME

SUMMARY OF FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On-Site Construction/ Utility Worker
Receptor Age: Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Sediment	Sediment	On-Site	Benzo(a)anthracene	2.42E-08	--	9.46E-10	2.52E-08	--	NC	--	NC	NC
			Benzo(a)pyrene	2.91E-07	--	1.13E-08	3.02E-07	--	NC	--	NC	NC
			Benzo(b)fluoranthene	4.04E-08	--	1.58E-09	4.20E-08	--	NC	--	NC	NC
			Dibenz(a,h)anthracene	7.76E-08	--	3.03E-09	8.06E-08	--	NC	--	NC	NC
			Indeno(1,2,3-cd) pyrene	3.07E-08	--	1.20E-09	3.19E-08	--	NC	--	NC	NC
			Arsenic	4.18E-07	--	3.77E-09	4.22E-07	skin discoloration	6.51E-02	--	5.86E-03	7.10E-02
			Cobalt	NC	--	NC	NC	--	3.46E-02	--	1.04E-03	3.57E-02
			Iron	NC	--	NC	NC	--	2.99E-02	--	8.97E-04	3.08E-02
			Manganese	NC	--	NC	NC	central nervous system	3.52E-02	--	2.64E-02	6.16E-02
			Thallium	NC	--	NC	NC	--	NC	--	NC	NC
			Aroclor-1254 (PCB-1254)	2.92E-08	--	1.23E-09	3.05E-08	immune system	5.11E-02	--	2.15E-02	7.26E-02
			Chemical Total	9.12E-07	--	2.31E-08	9.35E-07		2.16E-01	--	5.57E-02	2.72E-01
		Exposure Point Total					9.35E-07					2.72E-01
	Exposure Medium Total						9.35E-07					2.72E-01
Medium Total							9.35E-07					2.72E-01
				Total Risk Across All Media and All Exposure Routes			**2.5E-06**	**Total Hazard Index Across All Media and All Exposure Routes**				**3.1E+00**

Total Blood System HI Across All Media =	2.00E-02
Total Liver HI Across All Media =	1.52E-03
Total Body Weight HI Across All Media =	2.70E-02
Total Gastrointestinal System HI Across All Media =	1.18E+00
Total Kidney HI Across All Media =	2.73E-02
Total Mortality HI Across All Media =	1.30E-02
Total Skin Discoloration HI Across All Media =	2.13E-01
Total Proteinuria HI Across All Media =	5.11E-02
Total Central Nervous System HI Across All Media =	2.40E-01
Total Immune System HI Across All Media =	2.72E-01

Note:
NC = Not Calculated

TABLE B.9.4.CT

SUMMARY OF CURRENT/ FUTURE OFF-SITE RESIDENT RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off-Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air	Off-Site	1,1-Dichloroethane	–	4.41E-06	–	4.41E-06	–	–	NC	–	NC
			1,2-Dichloroethene (total)	–	9.51E-08	–	9.51E-08	–	–	1.19E-05	–	1.19E-05
			Benzene	–	1.12E-06	–	1.12E-06	blood system	–	3.72E-02	–	3.72E-02
			Chlorobenzene	–	NC	–	NC	–	–	2.18E-03	–	2.18E-03
			Chloroform	–	1.33E-07	–	1.33E-07	–	–	4.59E-04	–	4.59E-04
			cis-1,2-Dichloroethene	–	NC	–	NC	–	–	NC	–	NC
			Dibromochloromethane	–	2.15E-08	–	2.15E-08	–	–	NC	–	NC
			Ethylbenzene	–	7.17E-08	–	7.17E-08	liver	–	2.23E-04	–	2.23E-04
			Methylene chloride	–	3.79E-09	–	3.79E-09	–	–	6.28E-05	–	6.28E-05
			Tetrachloroethene	–	1.10E-07	–	1.10E-07	–	–	5.39E-04	–	5.39E-04
			Trichloroethene	–	3.87E-06	–	3.87E-06	–	–	NC	–	NC
			Vinyl chloride	–	8.29E-06	–	8.29E-06	liver	–	1.46E-01	–	1.46E-01
			Xylene (total)	–	NC	–	NC	body weight	–	1.86E-03	–	1.86E-03
			2-Methylnaphthalene	–	NC	–	NC	–	–	NC	–	NC
			bis(2-Ethylhexyl)phthalate	–	NC	–	NC	–	–	NC	–	NC
			Naphthalene	–	2.12E-08	–	2.12E-08	body weight	–	1.62E-03	–	1.62E-03
			Aluminum	–	NC	–	NC	–	–	NC	–	NC
			Antimony	–	NC	–	NC	–	–	NC	–	NC
			Arsenic	–	NC	–	NC	–	–	NC	–	NC
			Barium	–	NC	–	NC	kidney	–	NC	–	NC
			Cobalt	–	NC	–	NC	–	–	NC	–	NC
			Iron	–	NC	–	NC	–	–	NC	–	NC
			Lead	–	NC	–	NC	–	–	NC	–	NC
			Manganese	–	NC	–	NC	central nervous system	–	NC	–	NC
			Selenium	–	NC	–	NC	–	–	NC	–	NC
			Vanadium	–	NC	–	NC	–	–	NC	–	NC

TABLE B.9.4.CT

SUMMARY OF CURRENT/ FUTURE OFF-SITE RESIDENT RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off-Site Resident
Receptor Age: Child and Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Groundwater (cont.'d)	Indoor Air	Off-Site	Aroclor-1260 (PCB-1260)	--	NC	--	NC	--	--	NC	--	NC
			Heptachlor	--	NC	--	NC	--	--	NC	--	NC
			Chemical Total	--	1.81E-05	--	1.81E-05		--	1.91E-01	--	1.91E-01
		Exposure Point Total					1.81E-05					1.91E-01
	Exposure Medium Total						1.81E-05					1.91E-01
Medium Total							1.81E-05					1.91E-01
Groundwater	Household Use	Off-Site	1,1-Dichloroethane	8.12E-06	2.67E-07	3.61E-07	8.75E-06	--	6.85E-02	NC	8.43E-06	6.85E-02
			1,2-Dichloroethane	8.52E-07	2.85E-08	2.38E-08	9.04E-07	--	4.50E-03	3.87E-06	3.47E-07	4.50E-03
			Benzene	3.91E-06	6.49E-08	3.40E-07	4.32E-06	blood system	1.71E-01	2.35E-03	4.11E-05	1.73E-01
			Chlorobenzene	NC	NC	NC	NC	liver	6.49E-03	2.68E-04	3.64E-06	6.76E-03
			Chloroform	1.15E-07	1.00E-08	5.94E-09	1.31E-07	liver	3.57E-03	3.76E-05	5.09E-07	3.61E-03
			cis-1,2-Dichloroethene	NC	NC	NC	NC	--	6.08E-01	NC	8.46E-05	6.08E-01
			Dibromochloromethane	5.59E-07	2.10E-08	2.40E-08	6.04E-07	liver	3.20E-03	NC	3.80E-07	3.20E-03
			Ethylbenzene	1.45E-07	3.86E-09	4.95E-08	1.98E-07	liver	1.27E-03	1.31E-05	1.20E-06	1.28E-03
			Methylene chloride	6.32E-08	4.64E-10	1.34E-09	6.50E-08	liver	1.35E-03	8.35E-06	7.92E-08	1.36E-03
			Tetrachloroethene	1.95E-06	2.50E-09	6.59E-07	2.62E-06	liver	3.48E-03	1.33E-05	3.24E-06	3.49E-03
			Trichloroethene	3.40E-06	1.35E-07	3.34E-07	3.87E-06	--	NC	NC	NC	NC
			Vinyl chloride	9.53E-05	6.82E-08	2.80E-06	9.82E-05	liver	4.24E-01	1.31E-03	3.45E-05	4.25E-01
			Xylenes (total)	NC	NC	NC	NC	body weight	6.42E-04	1.32E-04	6.55E-07	7.75E-04
			2-Methylnaphthalene	NC	NC	NC	NC	respiratory system	3.14E-02	NC	6.82E-05	3.15E-02
			bis(2-Ethylhexyl)phthalate	1.52E-07	NC	1.33E-07	2.85E-07	liver	5.22E-03	NC	1.26E-05	5.23E-03
			Naphthalene	NC	2.49E-08	NC	2.49E-08	body weight	3.00E-03	2.06E-03	3.13E-06	5.07E-03
			Aluminum	NC	NC	NC	NC	--	6.58E-02	NC	4.10E-07	6.58E-02
			Antimony	NC	NC	NC	NC	mortality	1.45E-01	NC	6.02E-06	1.45E-01
			Arsenic	1.39E-04	NC	3.03E-07	1.39E-04	skin discoloration	2.96E+00	NC	1.84E-05	2.96E+00
			Barium	NC	NC	NC	NC	kidney	1.78E-01	NC	1.59E-05	1.78E-01
			Cobalt	NC	NC	NC	NC	--	1.28E+00	NC	3.19E-06	1.28E+00
			Iron	NC	NC	NC	NC	--	3.76E-01	NC	2.34E-06	3.76E-01
			Lead	NC	NC	NC	NC	--	NC	NC	NC	NC

TABLE B.9.4.CT

SUMMARY OF CURRENT/ FUTURE OFF-SITE RESIDENT RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off-Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.'d)	Household Use	Off-Site	Manganese	NC	NC	NC	NC	central nervous system	1.02E+00	NC	1.58E-04	1.02E+00
			Selenium	NC	NC	NC	NC	clinical selenosis	7.67E-02	NC	4.78E-07	7.67E-02
			Vanadium	NC	NC	NC	NC	mortality	2.21E-01	NC	5.29E-05	2.21E-01
			Aroclor-1260 (PCB-1260)	2.67E-06	NC	3.33E-04	3.36E-04	–	NC	NC	NC	NC
			Heptachlor	1.39E-06	NC	3.72E-07	1.76E-06	liver	5.92E-03	NC	4.39E-06	5.92E-03
			Chemical Total	2.57E-04	6.27E-07	3.38E-04	5.96E-04		7.66E+00	6.20E-03	5.24E-04	7.67E+00
		Exposure Point Total					5.96E-04					7.67E+00
	Exposure Medium Total						5.96E-04					7.67E+00
Medium Total							5.96E-04					7.67E+00
				Total Risk Across All Media and All Exposure Routes			6.1E-04	Total Hazard Index Across All Media and All Exposure Routes				7.9E+00

Total Blood System HI Across All Media =	2.10E-01
Total Liver HI Across All Media =	6.03E-01
Total Body Weight HI Across All Media =	7.70E-03
Total Kidney HI Across All Media =	1.78E-01
Total Central Nervous System HI Across All Media =	1.02E+00
Total Respiratory System HI Across All Media =	3.15E-02
Total Mortality HI Across All Media =	3.66E-01
Total Skin Discoloration HI Across All Media =	2.96E+00
Total Clinical Selenosis HI Across All Media =	7.67E-02

Note:
NC = Not Calculated

TABLE B.9.4.RME

SUMMARY OF CURRENT/ FUTURE OFF-SITE RESIDENT RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air	Off-Site	1,1-Dichloroethane	–	1.91E-05	–	1.91E-05	–	–	NC	–	NC
			1,2-Dichloroethane	–	4.11E-07	–	4.11E-07	–	–	1.54E-05	–	1.54E-05
			Benzene	–	4.84E-06	–	4.84E-06	blood system	–	4.83E-02	–	4.83E-02
			Chlorobenzene	–	NC	–	NC	–	–	2.83E-03	–	2.83E-03
			Chloroform	–	5.75E-07	–	5.75E-07	–	–	5.96E-04	–	5.96E-04
			cis-1,2-Dichloroethene	–	NC	–	NC	–	–	NC	–	NC
			Dibromochloromethane	–	9.32E-08	–	9.32E-08	–	–	NC	–	NC
			Ethylbenzene	–	3.10E-07	–	3.10E-07	liver	–	2.89E-04	–	2.89E-04
			Methylene chloride	–	1.64E-08	–	1.64E-08	–	–	8.15E-05	–	8.15E-05
			Tetrachloroethene	–	4.78E-07	–	4.78E-07	–	–	7.00E-04	–	7.00E-04
			Trichloroethene	–	1.68E-05	–	1.68E-05	–	–	NC	–	NC
			Vinyl chloride	–	3.58E-05	–	3.58E-05	liver	–	1.90E-01	–	1.90E-01
			Xylenes (total)	–	NC	–	NC	body weight	–	2.41E-03	–	2.41E-03
			2-Methylnaphthalene	–	NC	–	NC	–	–	NC	–	NC
			bis(2-Ethylhexyl)phthalate	–	NC	–	NC	–	–	NC	–	NC
			Naphthalene	–	9.18E-08	–	9.18E-08	body weight	–	2.10E-03	–	2.10E-03
			Aluminum	–	NC	–	NC	–	–	NC	–	NC
			Antimony	–	NC	–	NC	–	–	NC	–	NC
			Arsenic	–	NC	–	NC	–	–	NC	–	NC
			Barium	–	NC	–	NC	kidney	–	NC	–	NC
			Cobalt	–	NC	–	NC	–	–	NC	–	NC
			Iron	–	NC	–	NC	–	–	NC	–	NC
			Lead	–	NC	–	NC	–	–	NC	–	NC
			Manganese	–	NC	–	NC	central nervous system	–	NC	–	NC
			Selenium	–	NC	–	NC	–	–	NC	–	NC
			Vanadium	–	NC	–	NC	–	–	NC	–	NC

TABLE B.9.4.RME

SUMMARY OF CURRENT/ FUTURE OFF-SITE RESIDENT RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (cont.'d)	Indoor Air	Off-Site	Aroclor-1260 (PCB-1260)	–	NC	–	NC	–	–	NC	–	NC
			Heptachlor	–	NC	–	NC	–	–	NC	–	NC
			Chemical Total	–	7.85E-05	–	7.85E-05		–	2.47E-01	–	2.47E-01
		Exposure Point Total					7.85E-05					2.47E-01
	Exposure Medium Total						7.85E-05					2.47E-01
Medium Total							7.85E-05					2.47E-01
Groundwater	Household Use	Off-Site	1,1-Dichloroethane	1.82E-05	1.95E-06	1.41E-06	2.15E-05	–	6.85E-02	NC	1.51E-05	6.85E-02
			1,2-Dichloroethane	1.90E-06	2.08E-07	9.27E-08	2.21E-06	–	4.50E-03	1.17E-05	6.23E-07	4.51E-03
			Benzene	8.74E-06	4.74E-07	1.34E-06	1.06E-05	blood system	1.71E-01	7.12E-03	7.52E-05	1.78E-01
			Chlorobenzene	NC	NC	NC	NC	liver	6.49E-03	8.11E-04	6.34E-06	7.30E-03
			Chloroform	2.58E-07	7.31E-08	2.29E-08	3.54E-07	liver	3.57E-03	1.14E-04	8.86E-07	3.69E-03
			cis-1,2-Dichloroethene	NC	NC	NC	NC	–	6.08E-01	NC	1.52E-04	6.08E-01
			Dibromochloromethane	1.25E-06	1.53E-07	9.27E-08	1.50E-06	liver	3.20E-03	NC	6.62E-07	3.20E-03
			Ethylbenzene	3.24E-07	2.82E-08	1.93E-07	5.45E-07	liver	1.27E-03	3.96E-05	2.13E-06	1.31E-03
			Methylene chloride	1.41E-07	3.38E-09	5.26E-09	1.50E-07	liver	1.35E-03	2.53E-05	1.45E-07	1.37E-03
			Tetrachloroethene	4.37E-06	1.82E-08	2.54E-06	6.93E-06	liver	3.48E-03	4.02E-05	5.64E-06	3.52E-03
			Trichloroethene	7.61E-06	9.86E-07	1.29E-06	9.89E-06	–	NC	NC	NC	NC
			Vinyl chloride	2.13E-04	4.98E-07	1.14E-05	2.25E-04	liver	4.24E-01	3.98E-03	6.54E-05	4.28E-01
			Xylene (total)	NC	NC	NC	NC	body weight	6.42E-04	4.01E-04	1.17E-06	1.04E-03
			2-Methylnaphthalene	NC	NC	NC	NC	respiratory system	3.14E-02	NC	1.19E-04	3.16E-02
			bis(2-Ethylhexyl)phthalate	3.40E-07	NC	5.12E-07	8.52E-07	liver	5.22E-03	NC	2.19E-05	5.24E-03
			Naphthalene	NC	1.82E-07	NC	1.82E-07	body weight	3.00E-03	6.25E-03	5.45E-06	9.26E-03
			Aluminum	NC	NC	NC	NC	–	6.58E-02	NC	1.24E-06	6.58E-02
			Antimony	NC	NC	NC	NC	mortality	1.45E-01	NC	1.83E-05	1.45E-01
			Arsenic	3.10E-04	NC	1.77E-06	3.11E-04	skin discoloration	2.96E+00	NC	5.58E-05	2.96E+00
			Barium	NC	NC	NC	NC	kidney	1.78E-01	NC	4.81E-05	1.79E-01
			Cobalt	NC	NC	NC	NC	–	1.28E+00	NC	9.67E-06	1.28E+00
			Iron	NC	NC	NC	NC	–	3.76E-01	NC	7.08E-06	3.76E-01
			Lead	NC	NC	NC	NC	–	NC	NC	NC	NC

TABLE B.9.4.RME

SUMMARY OF CURRENT/ FUTURE OFF-SITE RESIDENT RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Groundwater (cont.'d)	Household Use	Off-Site	Manganese	NC	NC	NC	NC	central nervous system	1.02E+00	NC	4.79E-04	1.02E+00
			Selenium	NC	NC	NC	NC	clinical selenosis	7.67E-02	NC	1.45E-06	7.67E-02
			Vanadium	NC	NC	NC	NC	mortality	2.21E-01	NC	1.60E-04	2.21E-01
			Aroclor-1260 (PCB-1260)	5.96E-06	NC	1.28E-03	1.29E-03	--	NC	NC	NC	NC
			Heptachlor	3.10E-06	NC	1.43E-06	4.53E-06	liver	5.92E-03	NC	7.64E-06	5.93E-03
			Chemical Total	5.75E-04	4.57E-06	1.31E-03	1.89E-03		7.66E+00	1.88E-02	1.26E-03	7.68E+00
		Exposure Point Total					1.89E-03					7.68E+00
	Exposure Medium Total						1.89E-03					7.68E+00
Medium Total							1.89E-03					7.68E+00
				Total Risk Across All Media and All Exposure Routes			**2.0E-03**	**Total Hazard Index Across All Media and All Exposure Routes**				**7.9E+00**

Total Blood System HI Across All Media =	2.26E-01
Total Liver HI Across All Media =	6.50E-01
Total Body Weight HI Across All Media =	1.27E-02
Total Kidney HI Across All Media =	1.79E-01
Total Central Nervous System HI Across All Media =	1.02E+00
Total Respiratory System HI Across All Media =	3.16E-02
Total Mortality HI Across All Media =	3.66E-01
Total Skin Discoloration HI Across All Media =	2.96E+00
Total Clinical Selenosis HI Across All Media =	7.67E-02

Note:
NC = Not Calculated

TABLE B.9.5.CT

SUMMARY OF CURRENT/ FUTURE OFF SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Industrial/ Commercial Worker
Receptor Age: Child and Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Groundwater	Indoor Air	Off Site	1,1-Dichloroethane	--	2.71E-07	--	2.71E-07	--	--	NC	--	NC
			1,2-Dichloroethane	--	6.20E-09	--	6.20E-09	--	--	7.73E-07	--	7.73E-07
			Benzene	--	7.09E-08	--	7.09E-08	blood system	--	2.36E-03	--	2.36E-03
			Chlorobenzene	--	NC	--	NC	--	--	1.34E-04	--	1.34E-04
			Chloroform	--	8.68E-09	--	8.68E-09	--	--	3.00E-05	--	3.00E-05
			cis-1,2-Dichloroethene	--	NC	--	NC	--	--	NC	--	NC
			Dibromochloromethane	--	1.10E-09	--	1.10E-09	--	--	NC	--	NC
			Ethylbenzene	--	4.42E-09	--	4.42E-09	liver	--	1.38E-05	--	1.38E-05
			Methylene chloride	--	2.46E-10	--	2.46E-10	--	--	4.07E-06	--	4.07E-06
			Tetrachloroethene	--	6.78E-09	--	6.78E-09	--	--	3.31E-05	--	3.31E-05
			Trichloroethene	--	2.41E-07	--	2.41E-07	--	--	NC	--	NC
			Vinyl chloride	--	5.43E-07	--	5.43E-07	liver	--	9.60E-03	--	9.60E-03
			Xylenes (total)	--	NC	--	NC	body weight	--	1.14E-04	--	1.14E-04
			2-Methylnaphthalene	--	NC	--	NC	--	--	NC	--	NC
			bis(2-Ethylhexyl)phthalate	--	NC	--	NC	--	--	NC	--	NC
			Naphthalene	--	1.25E-09	--	1.25E-09	body weight	--	9.50E-05	--	9.50E-05
			Aluminum	--	NC	--	NC	--	--	NC	--	NC
			Antimony	--	NC	--	NC	--	--	NC	--	NC
			Arsenic	--	NC	--	NC	--	--	NC	--	NC
			Barium	--	NC	--	NC	kidney	--	NC	--	NC
			Cobalt	--	NC	--	NC	--	--	NC	--	NC
			Iron	--	NC	--	NC	--	--	NC	--	NC
			Lead	--	NC	--	NC	--	--	NC	--	NC
			Manganese	--	NC	--	NC	central nervous system	--	NC	--	NC
			Selenium	--	NC	--	NC	--	--	NC	--	NC
			Vanadium	--	NC	--	NC	--	--	NC	--	NC

TABLE B.9.5.CT

SUMMARY OF CURRENT/ FUTURE OFF SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
CENTRAL TENDENCY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Industrial/ Commercial Worker
Receptor Age: Child and Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Groundwater (cont.'d)	Indoor Air	Off Site	Aroclor-1260 (PCB-1260)	–	NC	–	NC	–	–	NC	–	NC
			Heptachlor	–	NC	–	NC	–	–	NC	–	NC
			Chemical Total	–	1.15E-06	–	1.15E-06		–	1.24E-02	–	1.24E-02
		Exposure Point Total					1.15E-06					1.24E-02
	Exposure Medium Total						1.15E-06					1.24E-02
Medium Total							1.15E-06					1.24E-02
				Total Risk Across All Media and All Exposure Routes			**1.2E-06**		**Total Hazard Index Across All Media and All Exposure Routes**			**1.2E-02**

Total Blood System HI Across All Media =	2.36E-03
Total Liver HI Across All Media =	9.61E-03
Total Body Weight HI Across All Media =	1.14E-04

Note:
NC = Not Calculated

TABLE B.9.5.RME

SUMMARY OF CURRENT/ FUTURE OFF SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Industrial/ Commercial Worker
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemicals of Potential Concern	Carcinogenic Risk				Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total	Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Indoor Air	Off Site	1,1-Dichloroethane	–	8.60E-07	–	8.60E-07	–	–	NC	–	NC
			1,2-Dichloroethane	–	1.97E-08	–	1.97E-08	–	–	8.82E-07	–	8.82E-07
			Benzene	–	2.25E-07	–	2.25E-07	blood system	–	2.69E-03	–	2.69E-03
			Chlorobenzene	–	NC	–	NC	–	–	1.53E-04	–	1.53E-04
			Chloroform	–	2.75E-08	–	2.75E-08	–	–	3.42E-05	–	3.42E-05
			cis-1,2-Dichloroethene	–	NC	–	NC	–	–	NC	–	NC
			Dibromochloromethane	–	3.49E-09	–	3.49E-09	–	–	NC	–	NC
			Ethylbenzene	–	1.40E-08	–	1.40E-08	liver	–	1.57E-05	–	1.57E-05
			Methylene chloride	–	7.81E-10	–	7.81E-10	–	–	4.65E-06	–	4.65E-06
			Tetrachloroethene	–	2.15E-08	–	2.15E-08	–	–	3.78E-05	–	3.78E-05
			Trichloroethene	–	7.64E-07	–	7.64E-07	–	–	NC	–	NC
			Vinyl chloride	–	1.72E-06	–	1.72E-06	liver	–	1.10E-02	–	1.10E-02
			Xylenes (total)	–	NC	–	NC	body weight	–	1.30E-04	–	1.30E-04
			2-Methylnaphthalene	–	NC	–	NC	–	–	NC	–	NC
			bis(2-Ethylhexyl)phthalate	–	NC	–	NC	–	–	NC	–	NC
			Naphthalene	–	3.95E-09	–	3.95E-09	body weight	–	1.08E-04	–	1.08E-04
			Aluminum	–	NC	–	NC	–	–	NC	–	NC
			Antimony	–	NC	–	NC	–	–	NC	–	NC
			Arsenic	–	NC	–	NC	–	–	NC	–	NC
			Barium	–	NC	–	NC	kidney	–	NC	–	NC
			Cobalt	–	NC	–	NC	–	–	NC	–	NC
			Iron	–	NC	–	NC	–	–	NC	–	NC
			Lead	–	NC	–	NC	–	–	NC	–	NC
			Manganese	–	NC	–	NC	central nervous system	–	NC	–	NC
			Selenium	–	NC	–	NC	–	–	NC	–	NC
			Vanadium	–	NC	–	NC	–	–	NC	–	NC

TABLE B.9.5.RME

SUMMARY OF CURRENT/ FUTURE OFF SITE INDUSTRIAL/ COMMERCIAL WORKER RISKS AND HAZARDS FOR CHEMICALS OF POTENTIAL CONCERN
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Industrial/ Commercial Worker
Receptor Age: Child and Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Groundwater (cont.'d)	Indoor Air	Off Site	Aroclor-1260 (PCB-1260)	--	NC	--	NC	--	--	NC	--	NC
			Heptachlor	--	NC	--	NC	--	--	NC	--	NC
			Chemical Total	--	3.66E-06	--	3.66E-06		--	1.41E-02	--	1.41E-02
		Exposure Point Total					3.66E-06					1.41E-02
	Exposure Medium Total						3.66E-06					1.41E-02
Medium Total							3.66E-06					1.41E-02
				Total Risk Across All Media and All Exposure Routes			**3.7E-06**		**Total Hazard Index Across All Media and All Exposure Routes**			**1.4E-02**

Total Blood System HI Across All Media =	2.69E-03
Total Liver HI Across All Media =	1.10E-02
Total Body Weight HI Across All Media =	1.30E-04

Note:
NC = Not Calculated

TABLE B.10.1.RME

RISK ASSESSMENT SUMMARY FOR CURRENT/ FUTURE ON SITE TRESPASSER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Trespasser
Receptor Age: Adolescent

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Non-Carcinogenic Hazard Quotient*				
				Primary Target Organ	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Surface Soil	Surface Soil	On Site	Arsenic	skin discoloration	5.27E-02	4.94E-05	1.23E-02	6.51E-02
			Copper	gastrointestinal system	7.34E-01	NC	5.73E-02	7.91E-01
			Chemical Total		7.34E-01	NC	5.73E-02	8.57E-01
		Exposure Point Total						8.57E-01
	Exposure Medium Total							8.57E-01
Medium Total								8.57E-01
							Total Hazard Index Across All Media and All Exposure Routes	**8.6E-01**

Total Gastrointestinal System HI Across All Media =	7.91E-01
Total Skin Discoloration HI Across All Media =	6.51E-02

Note:

NC = Not Calculated

TABLE B.10.2.RME

RISK ASSESSMENT SUMMARY FOR CURRENT/ FUTURE ON SITE INDUSTRIAL/ COMMERCIAL WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: On Site Industrial/Commercial Worker
Receptor Age: Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Non-Carcinogenic Hazard Quotient*				
				Primary Target Organ	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Surface Soil	Surface Soil	On Site	Arsenic	skin discoloration	1.67E-01	5.74E-04	3.31E-02	2.01E-01
			Copper	gastrointestinal system	2.33E+00	NC	1.54E-01	2.49E+00
			Chemical Total		2.50E+00	5.74E-04	1.87E-01	2.69E+00
		Exposure Point Total						2.69E+00
	Exposure Medium Total							2.69E+00
Medium Total								2.69E+00
							Total Hazard Index Across All Media and All Exposure Routes	**2.7E+00**

Total Gastrointestinal System HI Across All Media =	2.49E+00
Total Skin Discoloration HI Across All Media =	2.01E-01

Note:

NC = Not Calculated

TABLE B.10.3.RME

RISK ASSESSMENT SUMMARY FOR FUTURE ON-SITE CONSTRUCTION/ UTILITY WORKER
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Future
Receptor Population: On Site Construction/ Utility Worker
Receptor Age: Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Non-Carcinogenic Hazard Quotient*				
				Primary Target Organ	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Surface and Subsurface Soil	Soil	On-Site	Antimony	mortality	3.27E-01	NC	6.54E-02	3.93E-01
			Cobalt	–	1.46E-01	5.59E-02	4.38E-03	2.06E-01
			Copper	gastrointestinal system	1.15E+00	NC	3.45E-02	1.18E+00
			Manganese	central nervous system	3.28E-02	1.21E-01	2.46E-02	1.78E-01
			Mercury	–	1.22E-02	2.28E-01	3.66E-04	2.40E-01
			Aroclor-1254 (PCB-1254)	immune system	1.40E-01	NC	5.88E-02	1.99E-01
			Chemical Total		1.81E+00	4.04E-01	1.88E-01	2.40E+00
		Exposure Point Total						2.40E+00
	Exposure Medium Total							2.40E+00
Medium Total								2.40E+00
							Total Hazard Index Across All Media and All Exposure Routes	**2.4E+00**

Total Gastrointestinal System HI Across All Media =	1.18E+00
Total Mortality HI Across All Media =	3.93E-01
Total Central Nervous System HI Across All Media =	1.78E-01
Total Immune System HI Across All Media =	1.99E-01

Note:
NC = Not Calculated

TABLE B.10.4:RME

RISK ASSESSMENT SUMMARY FOR CURRENT/ FUTURE OFF-SITE RESIDENT
REASONABLE MAXIMUM EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Scenario Timeframe: Current/ Future
Receptor Population: Off Site Resident
Receptor Age: Child and Adult

Medium	*Exposure Medium*	*Exposure Point*	*Chemicals of Potential Concern*	*Carcinogenic Risk*				*Non-Carcinogenic Hazard Quotient*				
				Ingestion	*Inhalation*	*Dermal*	*Exposure Routes Total*	*Primary Target Organ*	*Ingestion*	*Inhalation*	*Dermal*	*Exposure Routes Total*
Groundwater	Household Use	Off-Site	Benzene	8.74E-06	4.74E-07	1.34E-06	1.06E-05	blood system	1.71E-01	7.12E-03	7.52E-05	1.78E-01
			cis-1,2-Dichloroethene	NC	NC	NC	NC	–	6.08E-01	NC	1.52E-04	6.08E-01
			Vinyl chloride	2.13E-04	4.98E-07	1.14E-05	2.25E-04	liver	4.24E-01	3.98E-03	6.54E-05	4.28E-01
			Antimony	NC	NC	NC	NC	mortality	1.45E-01	NC	1.83E-05	1.45E-01
			Arsenic	3.10E-04	NC	1.77E-06	3.11E-04	skin discoloration	2.96E+00	NC	5.58E-05	2.96E+00
			Barium	NC	NC	NC	NC	kidney	1.78E-01	NC	4.81E-05	1.79E-01
			Cobalt	NC	NC	NC	NC	–	1.28E+00	NC	9.67E-06	1.28E+00
			Iron	NC	NC	NC	NC	–	3.76E-01	NC	7.08E-06	3.76E-01
			Manganese	NC	NC	NC	NC	central nervous system	1.02E+00	NC	4.79E-04	1.02E+00
			Vanadium	NC	NC	NC	NC	mortality	2.21E-01	NC	1.60E-04	2.21E-01
			Aroclor-1260 (PCB-1260)	5.96E-06	NC	1.28E-03	1.29E-03	–	NC	NC	NC	NC
			Chemical Total	5.37E-04	9.72E-07	1.30E-03	1.84E-03		7.38E+00	1.11E-02	1.07E-03	7.39E+00
		Exposure Point Total					1.84E-03					7.39E+00
	Exposure Medium Total						1.84E-03					7.39E+00
Medium Total							1.84E-03					7.39E+00
				Total Risk Across All Media and All Exposure Routes			**1.8E-03**	**Total Hazard Index Across All Media and All Exposure Routes**				**7.4E+00**

Total Blood System HI Across All Media =	1.78E-01
Total Liver HI Across All Media =	4.28E-01
Total Kidney HI Across All Media =	1.79E-01
Total Central Nervous System HI Across All Media =	1.02E+00
Total Mortality HI Across All Media =	3.66E-01
Total Skin Discoloration HI Across All Media =	2.96E+00

Note:
NC = Not Calculated

APPENDIX C

INDOOR AIR (J&E) MODELING

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	C-1
2.0	METHODOLOGY	C-2
	2.1 DERIVATION OF estimated INDOOR AIR EPCs FROM SOIL VAPOR	C-2
	2.2 DERIVATION OF estimated INDOOR AIR EPCs FROM GROUNDWATER	C-3
	2.3 Conservative features of J&E Model	C-3
3.0	ESTIMATED INDOOR AIR EPCS	C-5
	3.1 COMPOUND PROPERTIES	C-5
	3.2 VADOSE ZONE CONDITIONS	C-5
	3.3 BUILDING PROPERTIES	C-6
	3.4 ESTIMATED INDOOR AIR EPC RESULTS	C-8
4.0	REFERENCES	C-9

LIST OF TABLES
(Following Text)

TABLE C.1 SOIL GAS PROBE COMPLETION DETAILS

TABLE C.2 GROUNDWATER ELEVATION SUMMARY

TABLE C.3 DERIVATION OF INDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM SOIL VAPOR - ON-SITE INDUSTRIAL/COMMERCIAL WORKER INDOOR AIR INHALATION EXPOSURE

TABLE C.4 DERIVATION OF INDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM ON-SITE GROUNDWATER - OFF-SITE INDUSTRIAL/COMMERCIAL WORKER INDOOR AIR INHALATION EXPOSURE

TABLE C.5 DERIVATION OF INDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM ON-SITE GROUNDWATER - OFF-SITE RESIDENT INDOOR AIR INHALATION EXPOSURE

1.0 INTRODUCTION

This Appendix presents the estimation of indoor air Exposure Point Concentrations (EPCs) for volatile contaminants of concern (COCs) in soil vapor and groundwater at the property at the South Dayton Dump and Landfill Site (Site). The estimated indoor air EPCs are applied in the Baseline Risk Assessment (BRA) to assess the potential health risks/hazards posed by the indoor air inhalation exposure pathway. Vapor migration into indoor air is of concern at the Site due to the presence of volatile chemicals in Site soil vapor and groundwater.

The Johnson and Ettinger (1991) model (J&E Model) developed by the United States Environmental Protection Agency (USEPA) (USEPA, 2004) was applied to estimate indoor air COC concentrations from impacted soil vapor and groundwater. Potential indoor air COC concentrations were estimated following the approach applied by the USEPA in their document entitled, "Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)" (USEPA, 2002).

The methodology for developing the estimated indoor air EPCs is presented in Section 2.0. The input parameters applied to develop the EPCs are presented in Section 3.0. All references cited in this Appendix are listed in Section 4.0

2.0 METHODOLOGY

The methodology applied to estimate indoor air EPCs from the soil vapor sampling results using the J&E Model is described in Section 2.1. The methodology applied to estimate indoor air EPCs from the groundwater sampling results using the J&E Model is described in Section 2.2. A description of several conservative features inherent to the J&E Model is provided in Section 2.3.

2.1 DERIVATION OF ESTIMATED INDOOR AIR EPCS FROM SOIL VAPOR

The reasonable maximum exposure (RME) concentrations of the volatile COCs identified in Site soil vapor in September 2009 (see Table B.3.3 of Appendix B) were applied to estimate indoor air EPCs as follows:

$$C_{building} = C_{sg} \times \alpha$$

Where:

$C_{building}$ - predicted indoor air concentration within a building based on the measured soil vapor concentration [micrograms per cubic meter (µg/m³)].

C_{sg} - the RME COC concentration in soil vapor [micrograms per cubic meter (µg/m³)].

α - Site-specific calculated soil gas attenuation factor which relates the indoor air concentration to the concentration in soil vapor based on the heuristic model developed by Johnson and Ettinger (1991; Equation 21) and accounts for the advective-diffusive migration of volatile contaminants in soil vapor through the vadose zone soil and building foundation, followed by the mixing of the intruding vapors with building indoor air.

The derivation of the Site-specific soil gas attenuation factor for the soil vapor to indoor air pathway was conducted through the application of the J&E Model for soil gas incorporated into the Microsoft Excel spreadsheet developed by the USEPA (USEPA, 2004; "SG-ADV-Feb04.xls, Version 3.1"). The USEPA implementation of the J&E Model has undergone extensive peer review and is widely accepted by regulatory agencies throughout the United States. The Site-specific compound, vadose zone soil, and building properties applied in the derivation of the soil gas attenuation factor and the estimation of indoor air EPCs at the Site are presented in Section 3.0.

2.2 DERIVATION OF ESTIMATED INDOOR AIR EPCS FROM GROUNDWATER

The RME concentrations derived for the volatile COCs identified in groundwater in 2009 (see Table B.3.6 of Appendix B) were applied to estimate indoor air EPCs as follows:

$$C_{building} = C_{gw} \times \alpha \times H \times CF$$

Where:

$C_{building}$ - predicted indoor air concentration within a building based on the measured groundwater concentration (micrograms per cubic meter [$\mu g/m^3$]).

C_{gw} - the RME COC concentration in groundwater [micrograms per litre ($\mu g/L$)].

H - compound-specific dimensionless Henry's Law constant equal to $H_L/(R \times T)$, where H_L is the dimensioned Henry's Law constant [atmospheres cubic metres per mole (atm m^3/mol)], R is the Universal Gas Law constant [8.206×10^{-3} atmospheres cubic metres per mole Kelvin (atm m^3/mol K)], and T is the vadose zone temperature in Kelvin.

CF - Units conversion factor of 1,000 litres per cubic metre (L/m^3).

The derivation of the Site-specific soil gas attenuation factor for the groundwater to indoor air pathway was conducted through the application of the J&E Model for groundwater incorporated into the Microsoft Excel spreadsheet developed by the USEPA (USEPA, 2004; "GW-ADV-Feb04.xls, Version 3.1"). The Site-specific compound, vadose zone soil, and building properties applied in the derivation of the soil gas attenuation factor, and thus the estimation of indoor air EPCs, at the Site are presented in Section 3.0.

2.3 CONSERVATIVE FEATURES OF J&E MODEL

It is important to note that the J&E Model used to develop the indoor air EPCs incorporates several conservative assumptions. The key conservative aspects incorporated into the J&E Model are described below:

- The J&E Model assumes that all contaminant vapors below a building migrate vertically upward into the building and do not move laterally, or in three-dimensions, around the building to vent to the atmosphere.

- The J&E Model assumes that no contaminant vapors migrate around the sides of buildings through preferential pathways, such as granular foundation bedding material, to vent to the atmosphere.
- The J&E Model assumes there is a constant and continuous source of COCs in the subsurface. Source depletion due to naturally occurring biological or chemical degradation of contaminants is not considered.

All of the conservative aspects described above combine to produce a higher estimate of indoor air EPCs than is actually expected to occur.

3.0 ESTIMATED INDOOR AIR EPCS

The estimated indoor air EPCs were developed using the J&E model with Site-specific compound, vadose zone soil, and building properties. The compound-specific inputs applied in the J&E Model are described in Section 3.1. The details of the vadose zone conditions at the Site are presented in Section 3.2. The details of the building properties applied in the estimation of the indoor air EPCs are described in Section 3.3. The estimation of the indoor air EPCs is presented in Section 3.4.

3.1 COMPOUND PROPERTIES

The compound properties applied in the estimation the indoor air EPCs consist of a Henry's Law constant, a water diffusion coefficient, and an air diffusion coefficient. Where possible, the applied compound properties for the COCs were obtained from the chemical properties database developed in USEPA (2004). For xylenes, the applied compound properties were obtained from the USEPA (2009). For 1,2-dichloroethylene (total), chemical properties data for cis-1,2-dichloroethylene were applied as surrogate values. The Henry's Law constant and air diffusion coefficient were corrected to a vadose zone temperature of 11 degrees Celsius, which corresponds to the average shallow groundwater temperature in the Ohio, as presented in USEPA (2004; Figure 8).

3.2 VADOSE ZONE CONDITIONS

Ideally the indoor air EPCs for the Site would be estimated using the J&E Model with Site-specific vadose zone soil properties. As Site-specific soil physical properties were not available, default values were conservatively applied. An analysis of previous Site reports, as well as the stratigraphic logs for test pits and monitoring wells at the Site indicate that the vadose zone soils consist of a range of materials, from fill to till, and contain a large proportion of sand. To be conservative, a sand soil type, as incorporated in the USEPA (2004) J&E Model, was applied in the modeling.

The Site-specific vadose zone soil physical properties applied in the development of the indoor air EPCs consist of the following:

- Porosity, ε_T:

  A porosity value of 37.5 percent was applied, corresponding to the default value for a sand soil type, as implemented in USEPA (2004).

- Moisture-filled porosity, ε_M:

  A default moisture-filled porosity value of 0.054 was applied, corresponding to the default value for a sand soil type, as implemented in USEPA (2004).

- Dry bulk soil density, ρ_{db}:

  A dry bulk soil density value of 1.66 g/cm^3 was applied, corresponding to the default value for a sand soil type, as implemented in USEPA (2004).

- Soil vapor sampling depth below grade, L_S:

  A distance of 0.91 m was applied, based on the minimum measured depth to the top of the soil vapor probe screens of 3 feet (0.91 meters), as indicated in Table C.1.

- Depth below grade to water table, L_{WT}:

  A distance of 3.08 m was applied, based on the geometric mean depth to site groundwater, as indicated in Table C.2.

3.3 BUILDING PROPERTIES

The building properties applied in the development of the indoor air EPCs consisted of the following:

- Enclosed space floor length, L_B:
  An enclosed floor space length of 1,000 centimeters (cm) was applied, based on the default building dimensions indicated in USEPA (2004).

- Enclosed space floor width, W_B:
  An enclosed floor space width of 1,000 cm was applied, based on the default building dimensions, as indicated in USEPA (2004).

- Enclosed space height, H_B:

  Industrial/Commercial: For the industrial/commercial building, an enclosed space height of 244 cm was applied, based on the default building dimensions for a slab-on-grade structure indicated in USEPA (2004).

  Residential: For the off-Site residential building, an enclosed space height of 366 cm was applied, based on the default building mixing height for a building with a basement, as indicated in USEPA (2004).

- Building indoor air exchange rate, T_{air}:

  Industrial/Commercial: A building indoor air exchange rate of 0.83 building volumes per hour was applied for the industrial/commercial building scenario consistent with the industrial air exchange rate indicated in ASTM (1995).

  Residential: A building indoor air exchange rate of 0.25 building volumes per hour was applied for the residential building scenario consistent with the default indoor air exchange rate indicated in USEPA (2004).

- Foundation thickness, L_{crack}:

  A foundation thickness of 15 cm was applied, based on the default foundation thickness, as indicated in USEPA (2004).

- Depth below grade to bottom of enclosed space floor, L_F:

  Industrial/Commercial: A depth below grade to the bottom of enclosed space floor of 15 cm was applied, consistent with the default depth to base of foundation for a slab-on-grade building scenario, as indicated in USEPA (2004).

  Residential: A depth below grade to the bottom of enclosed space floor of 200 cm was applied, consistent with the default depth to base of foundation for a basement scenario, as indicated in USEPA (2004).

- Ratio of building crack area to building below-grade area, η:

  Industrial/Commercial: A ratio of 0.00038 (or 0.038 percent) was applied for slab-on-grade structures, consistent with the default crack ratios presented in USEPA (2004).

  Residential: A ratio of 0.0002 (or 0.02 percent) was applied for basement structures, consistent with the default crack ratios presented in USEPA (2004).

- Vadose zone/building pressure differential, ΔP:

  A pressure differential value of 4 Pascal (Pa) is applied consistent with USEPA (2004).

- Average vapor flow rate into building, Q_{soil}:

  An average vapor flow rate into the building of 5 L/min was applied, consistent with the default average flow rate into a building, as indicated in USEPA (2004).

3.4 ESTIMATED INDOOR AIR EPC RESULTS

The estimated industrial/commercial indoor air EPCs determined from the soil vapor sampling results are presented in Table C.3. The estimated off-Site industrial/commercial indoor air EPCs determined from the on-Site groundwater sampling results are presented in Table C.4. The estimated off-Site residential indoor air EPCs determined from the groundwater sampling results are presented in Table C.5. The applied chemical, vadose zone soil, and building properties described in Sections 3.1 to 3.3 above are summarized in each of the aforementioned tables. The resulting indoor air EPCs are applied in the BRA to assess potential health risks/hazards posed by the indoor air inhalation exposure pathway.

4.0 REFERENCES

ASTM, 1995. Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, ASTM Designation: E1739-95, West Conshohocken, PA.

Johnson, P.C. and R.A. Ettinger, 1991. Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors into Buildings, Environmental Science and Technology, 25(8), pp. 1445-1452.

USEPA, 2002. Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance), EPA Report No. EPA530-F-02-052, November.

USEPA, 2004. User's Guide for Evaluating Subsurface Vapor Intrusion into Buildings, Office of Emergency and Remedial Response, Washington, DC, February 22.

USEPA, 2009. USEPA Regional Screening Level (RSL) Table, December 2009.

TABLE C.1

SOIL GAS PROBE COMPLETION DETAILS
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Well Identification	*Screened Interval*		*Stratigraphy Description of Screened Interval*
	ft bgs	*m bgs*	
GP01-09	3 - 4	0.91 - 1.22	silt (fill), sand and gravel
GP02-09	7 - 8	2.13 - 2.44	fill, foundary sand
GP03-09	4 - 5	1.22 - 1.52	sand
GP04-09	12 - 13	3.66 - 3.96	sand
GP05-09	7 - 8	2.13 - 2.44	sand and gravel (fill)
GP06-09	9 - 10	2.74 - 3.05	sand and silt
GP07-09	12 - 13	3.66 - 3.96	sand and gravel
GP08-09	11.67 - 12.67	3.56 - 3.86	sand
GP09-09	6.5 - 7.5	1.98 - 2.29	sand and silt
GP10-09	17 - 18	5.18 - 5.49	sand and gravel
GP11-09	8 - 9	2.44 - 2.74	sand and silt
GP12-09	5 - 6	1.52 - 1.83	sand
GP13-09	6 - 7	1.83 - 2.13	sand
GP14-09	5 - 6	1.52 - 1.83	sand and gravel
GP15-09	9 - 10	2.74 - 3.05	sand and silt
GP16-09	7 - 8	2.13 - 2.44	sand and silt
GP17-09	4 - 5	1.22 - 1.52	foundary sand (fill)
GP18-09	3 - 4	0.91 - 1.22	sand
GP19-09	4 - 5	1.22 - 1.52	sand (fill)
GP20-09	4 - 5	1.22 - 1.52	sand (fill)
GP21-09	3 - 4	0.91 - 1.22	sand, silt, gravel
MINIMUM DEPTH TO TOP OF SOIL GAS PROBE SCREEN (m bgs):		**0.91**	

Notes:
ft bgs - feet below ground surface.
m bgs - metres below ground surface.

TABLE C.2

GROUNDWATER ELEVATION SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

	Groundwater Elevation (m bgs)								
Well ID	*25/07/2008*	*11/08/2008*	*02/09/2008*	*09/10/2008*	*07/11/2008*	*10/12/2008*	*06/01/2009*	*09/02/2009*	*09/03/2009*
MW-101A	3.60	3.86	4.04	4.18	4.27	4.23	3.79	3.92	3.82
MW-102	--	--	1.83	1.92	2.01	1.96	1.49	1.37	1.53
MW-103	1.42	1.72	1.92	2.03	2.11	2.04	1.58	1.43	1.61
MW-104	--	--	--	5.96	5.99	5.97	5.58	5.70	5.55
MW-201	0.88	1.18	1.38	1.50	1.59	1.52	1.07	0.85	1.08
MW-202	6.04	6.28	6.50	6.70	6.81	6.81	6.40	6.48	6.38
MW-203	5.27	5.50	5.70	5.90	6.02	6.01	5.63	5.79	5.61
MW-204	3.00	3.23	3.42	3.61	3.73	3.71	3.34	3.42	3.33
MW-206	1.13	1.41	1.62	1.75	1.83	1.77	1.32	1.06	1.31
MW-207	1.26	1.48	1.69	1.82	1.91	1.85	1.43	1.09	1.42
MW-208	6.34	6.60	6.82	7.00	7.11	7.11	6.67	6.74	6.65
MW-209	0.63	0.86	1.02	1.19	1.29	1.27	0.92	0.98	0.91
MW-209A	--	--	--	--	--	--	--	--	--
MW-210	5.94	6.16	6.37	6.58	6.70	6.70	6.31	6.43	6.29
MW-212	4.85	5.07	5.22	5.40	5.50	5.48	5.14	5.19	5.13
MW-214	--	--	--	--	--	--	--	--	--
MW-215A	--	--	--	--	--	--	--	--	--
MW-215B	--	--	--	--	--	--	--	--	--
MW-217	--	--	--	--	--	--	--	--	--
MW-218A	--	--	--	--	--	--	--	--	--
MW-218B	--	--	--	--	--	--	--	--	--

GEOMETRIC MEAN GROUNDWATER ELEVATION (m BGS): 3.08

TABLE C.2

GROUNDWATER ELEVATION SUMMARY
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

	Groundwater Elevation (m bgs)						
Well ID	*07/04/2009*	*08/05/2009*	*15/06/2009*	*20/07/2009*	*11/08/2009*	*10/09/2009*	*09/10/2009*
MW-101A	3.79	3.49	3.87	4.04	4.09	4.11	4.12
MW-102	1.28	1.06	1.58	1.74	1.82	1.85	1.86
MW-103	1.33	1.12	1.65	1.86	1.90	1.93	1.94
MW-104	5.53	5.27	5.54	5.71	5.78	5.80	5.85
MW-201	0.75	0.57	1.12	1.33	1.37	1.40	1.42
MW-202	6.32	6.08	6.37	6.54	6.61	6.64	6.67
MW-203	5.56	5.34	5.61	5.76	5.82	5.85	5.86
MW-204	3.30	3.06	3.33	3.48	3.53	3.55	3.57
MW-206	0.95	0.79	1.34	1.57	1.60	1.63	1.65
MW-207	0.99	0.90	1.41	1.65	1.68	1.71	1.73
MW-208	6.54	6.29	6.64	6.84	6.89	6.92	6.96
MW-209	0.88	0.66	0.93	1.07	1.13	1.14	1.16
MW-209A	--	--	--	1.02	1.08	1.10	1.11
MW-210	6.27	6.04	6.28	6.43	6.50	6.52	6.55
MW-212	5.10	4.89	5.16	5.28	5.35	5.36	5.38
MW-214	--	--	--	4.58	4.62	4.62	4.64
MW-215A	--	--	--	6.76	6.83	6.88	6.89
MW-215B	--	--	--	6.81	6.87	6.90	6.92
MW-217	--	--	--	8.46	8.50	8.53	8.55
MW-218A	--	--	--	3.59	3.62	3.64	3.65
MW-218B	--	--	--	3.47	3.57	3.54	3.56

TABLE C.3

DERIVATION OF INDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM SOIL VAPOR - ON-SITE INDUSTRIAL/COMMERCIAL WORKER INDOOR AIR INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern (COPC)	Chemical Properties (1): Henry's Law Constant, H_L (atm m³/mol)		Water Diffusion Coefficient, D_{H2O} (cm²/s)		Air Diffusion Coefficient, D_{air} (cm²/s)		Soil Vapor Concentration C_{sg} (2) (µg/m³)	Johnson & Ettinger Attenuation Factor α (unitless) (3)	Indoor Air EPC in Building $C_{building}$ (4) (µg/m³)
VOCs									
1,1-Dichloroethane	3.02E-03	(11°C)	1.05E-05	(25°C)	6.90E-02	(11°C)	1.17E+03	9.45E-04	1.10E+00
1,1-Dichloroethene	1.53E-02	(11°C)	1.04E-05	(25°C)	8.37E-02	(11°C)	6.15E+01	1.01E-03	6.21E-02
1,4-Dichlorobenzene	9.41E-04	(11°C)	7.90E-06	(25°C)	6.42E-02	(11°C)	2.12E+00	9.20E-04	1.95E-03
Benzene	2.82E-03	(11°C)	9.80E-06	(25°C)	8.19E-02	(11°C)	7.40E+03	1.00E-03	7.41E+00
Bromomethane	3.89E-03	(11°C)	1.21E-05	(25°C)	6.77E-02	(11°C)	8.50E+00	9.38E-04	7.98E-03
Chlorobenzene	1.63E-03	(11°C)	8.70E-06	(25°C)	6.79E-02	(11°C)	6.78E+03	9.39E-04	6.37E+00
Chloroethane	5.39E-03	(11°C)	1.15E-05	(25°C)	2.52E-01	(11°C)	2.29E+02	1.28E-03	2.94E-01
Chloroform	1.95E-03	(11°C)	1.00E-05	(25°C)	9.68E-02	(11°C)	3.11E+01	1.05E-03	3.28E-02
cis-1,2-Dichloroethene	2.14E-03	(11°C)	1.13E-05	(25°C)	6.85E-02	(11°C)	8.87E+03	9.42E-04	8.36E+00
Cyclohexane	7.40E-02	(11°C)	9.10E-06	(25°C)	7.44E-02	(11°C)	2.70E+04	9.70E-04	2.62E+01
Dichlorodifluoromethane	1.71E-01	(11°C)	9.92E-06	(25°C)	6.19E-02	(11°C)	7.51E+02	9.07E-04	6.81E-01
Ethylbenzene	3.38E-03	(11°C)	7.80E-06	(25°C)	6.98E-02	(11°C)	2.53E+04	9.49E-04	2.40E+01
Isopropylbenzene	5.11E-03	(11°C)	7.10E-06	(25°C)	6.05E-02	(11°C)	4.10E+03	8.99E-04	3.69E+00
Methyl Tert Butyl Ether	3.40E-04	(11°C)	1.05E-05	(25°C)	9.53E-02	(11°C)	3.80E+01	1.05E-03	3.99E-02
Methylene chloride	1.22E-03	(11°C)	1.17E-05	(25°C)	9.40E-02	(11°C)	1.11E+01	1.05E-03	1.16E-02
Naphthalene	1.65E-04	(11°C)	7.50E-06	(25°C)	5.49E-02	(11°C)	3.73E+02	8.64E-04	3.22E-01
Tetrachloroethene	8.30E-03	(11°C)	8.20E-06	(25°C)	6.70E-02	(11°C)	1.25E+02	9.35E-04	1.17E-01
Toluene	3.10E-03	(11°C)	8.60E-06	(25°C)	8.09E-02	(11°C)	1.53E+03	9.98E-04	1.53E+00
trans-1,2-Dichloroethene	5.17E-03	(11°C)	1.19E-05	(25°C)	6.58E-02	(11°C)	2.20E+02	9.28E-04	2.04E-01
Trichloroethene	5.05E-03	(11°C)	9.10E-06	(25°C)	7.35E-02	(11°C)	2.96E+04	9.66E-04	2.86E+01
Trichlorofluoromethane	5.80E-02	(11°C)	9.70E-06	(25°C)	8.09E-02	(11°C)	1.91E+01	9.98E-04	1.91E-02
Vinyl chloride	1.78E-02	(11°C)	1.23E-05	(25°C)	9.86E-02	(11°C)	2.77E+03	1.06E-03	2.93E+00
Xylene (total)	2.21E-03	(11°C)	9.90E-06	(25°C)	7.91E-02	(11°C)	2.47E+04	9.91E-04	2.44E+01

Notes:

(1) The applied chemical properties for most chemicals were obtained from the chemical properties database implemented in USEPA (2004). The applied chemical properties for cyclohexane and xylenes (total) were obtained from USEPA (2009). The Henry's Law constant and air diffusion coefficient were corrected for an average vadose zone temperature of 11 °C. The reference temperature for the water diffusion coefficient is 25°C and, considering its low value, a correction to 11 °C was considered negligible.

(2) For RME soil gas concentrations, refer to Table B.3.3.

(3) The soil gas attenuation factor α is based on the solution for soil gas migration to building indoor air presented in Johnson and Ettinger [1991; Equation (21)], the vadose zone and building properties listed below, and a 4 Pa pressure difference between the vadose zone and the building (ΔP) as applied by USEPA (2004). The calculation of the soil gas attenuation factor was conducted using the Excel spreadsheet "SG-ADV-Feb04.xls" developed by USEPA (2004) and the following Site-specific vadose zone and building properties.

Vadose Zone Soil Properties:

Total Porosity, ε_T (%)	37.5	Default porosity for a sand soil type as implemented in USEPA (2004).
Moisture-Filled Porosity, ε_m	0.054	Default moisture-filled porosity for a sand soil type, as implemented in USEPA (2004).
Vapor-Filled Porosity, ε_v	0.321	Vapor-filled porosity, $\varepsilon_v = \varepsilon_T / 100 - \varepsilon_m$
Dry Bulk Soil Density, ρ_{db} (g/cm³)	1.66	Default dry bulk density for a sand soil type, as implemented in USEPA (2004).
Vadose Zone Temperature (°C)	11	Based on average shallow groundwater temperature in the Ohio, as presented in USEPA (2004; Figure 8).
Soil Gas Sampling Depth Below Grade, L_s (m)	0.91	Conservatively applied minimum depth to top of soil vapor screens of 3 feet (0.91 m), as indicated in Table B.1.

Building Properties:

Enclosed Floor Space Length, L_B (m)	10	Based on default building dimensions of 10 m x 10 m, as indicated in USEPA (2004).
Enclosed Floor Space Width, W_B (m)	10	Based on default building dimensions of 10 m x 10 m, as indicated in USEPA (2004).

TABLE C.3

DERIVATION OF INDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM SOIL VAPOR - ON-SITE INDUSTRIAL/COMMERCIAL WORKER INDOOR AIR INHALATION EXPOSURE

SOUTH DAYTON DUMP AND LANDFILL SITE

MORAINE, OHIO

Enclosed Space Height, H_B (m)	2.44	Based on a default commercial building ceiling height of 2.44 m, as indicated in USEPA (2004).
Building Air Exchange Rate, T_{air} (1/hr)	0.83	Industrial indoor air exchange rate, as indicated in ASTM (1995).
Ratio of Crack Area to Below-Grade Area, h (%)	0.038	Default crack ratio for slab-on-grade structures, as indicated in USEPA (2004).
Foundation Thickness, L_{crack} (cm)	15	Assumed based on default floor slab thickness of 15 cm (6 inches), as presented in USEPA (2004).
Depth Below Grade to Bottom of Enclosed Space Floor, L_F (cm)	15	Based on a typical slab depth of 0.15 m below grade, as indicated in USEPA (2004).
Average Vapor Flow Rate Into Building, Q_{soil} (L/min)	5	Default average vapor flow rate into building, as indicated in USEPA (2004).

(4) The exposure point concentration in the building is calculated from, $C_{building} = C_{sg} * \alpha$.

TABLE C.4

DERIVATION OF INDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM ON-SITE GROUNDWATER - OFF-SITE INDUSTRIAL/COMMERCIAL WORKER INDOOR AIR INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern (COPC)	Chemical Properties (1): Henry's Law Constant, H_L (atm·m³/mol)	Chemical Properties (1): Water Diffusion Coefficient, D^{H_2O} (cm²/s)	Chemical Properties (1): Air Diffusion Coefficient, D^{air} (cm²/s)	Groundwater Concentration C_{gw} (2) (µg/L)	Johnson & Ettinger Attenuation Factor α (3)	Indoor Air EPC in Building $C_{building}$ (4) (µg/m³)	Indoor Air EPC in Building $C_{building}$ (4) (mg/m³)
VOCs							
1,1-Dichloroethane	3.02E-03 (11°C)	1.05E-05 (25°C)	6.90E-02 (11°C)	2.14E+02	2.38E-04	6.59E+00	6.59E-03
1,2-Dichloroethane	4.81E-04 (11°C)	9.90E-06 (25°C)	9.68E-02 (11°C)	1.41E+00	3.19E-04	9.27E-03	9.27E-06
Benzene	2.82E-03 (11°C)	9.80E-06 (25°C)	8.19E-02 (11°C)	1.07E+01	2.73E-04	3.53E-01	3.53E-04
Chlorobenzene	1.63E-03 (11°C)	8.70E-06 (25°C)	6.79E-02 (11°C)	2.03E+00	2.35E-04	3.35E-02	3.35E-05
Chloroform	1.95E-03 (11°C)	1.00E-05 (25°C)	9.68E-02 (11°C)	5.59E-01	3.13E-04	1.47E-02	1.47E-05
cis-1,2-Dichloroethene	2.14E-03 (11°C)	1.13E-05 (25°C)	6.85E-02 (11°C)	9.51E+01	2.37E-04	2.07E+00	2.07E-03
Dibromochloromethane	4.45E-04 (11°C)	1.05E-05 (25°C)	1.82E-02 (11°C)	1.00E+00	8.31E-05	1.58E-03	1.58E-06
Ethylbenzene	3.38E-03 (11°C)	7.80E-06 (25°C)	6.98E-02 (11°C)	1.98E+00	2.39E-04	6.88E-02	6.88E-05
Methylene chloride	1.22E-03 (11°C)	1.17E-05 (25°C)	9.40E-02 (11°C)	1.27E+00	3.08E-04	2.04E-02	2.04E-05
Tetrachloroethene	8.30E-03 (11°C)	8.20E-06 (25°C)	6.70E-02 (11°C)	5.44E-01	2.31E-04	4.47E-02	4.47E-05
Trichloroethene	5.05E-03 (11°C)	9.10E-06 (25°C)	7.35E-02 (11°C)	8.67E+01	2.50E-04	4.69E+00	4.69E-03
Vinyl chloride	1.78E-02 (11°C)	1.23E-05 (25°C)	9.86E-02 (11°C)	1.99E+01	3.16E-04	4.80E+00	4.80E-03
Xylene (total)	2.87E-03 (11°C)	9.34E-06 (25°C)	6.64E-02 (11°C)	2.01E+00	2.30E-04	5.69E-02	5.69E-05
SVOCs							
2-Methylnaphthalene	1.34E-04 (11°C)	7.75E-06 (25°C)	4.86E-02 (11°C)	1.97E+00	2.00E-04	2.27E-03	2.27E-06
Naphthalene	1.65E-04 (11°C)	7.50E-06 (25°C)	5.49E-02 (11°C)	9.39E-01	2.15E-04	1.42E-03	1.42E-06

Notes:

(1) The applied chemical properties are obtained from the chemical properties database implemented in USEPA (2004). Chemical properties data for cis-1,2-dichloroethylene were applied as surrogate values for 1,2-dichloroethylene (total). The Henry's Law constants and air diffusion coefficients were corrected for an average vadose zone temperature of 11°C. The reference temperature for the water diffusion coefficients is 25°C and, considering its low value, a correction to 11°C was considered negligible.

(2) For RME groundwater concentrations, refer to Table B.3.6.

(3) The soil gas attenuation factor α is based on the solution for soil gas migration to building indoor air presented in Johnson and Ettinger [1991; Equation (21)], the vadose zone and building properties listed below, and a 4 Pa pressure difference between the vadose zone and the building (ΔP) as applied by USEPA (2004). The calculation of the soil gas attenuation factor was conducted using a modified version of the Excel spreadsheet "GW-ADV-Feb04.xls" developed by USEPA (2004). The following vadose zone and building properties were also applied.

TABLE C.4

DERIVATION OF INDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM ON-SITE GROUNDWATER - OFF-SITE INDUSTRIAL/COMMERCIAL WORKER INDOOR AIR INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Vadose Zone Soil Properties:		
Total Porosity, ε_T (%)	37.5	Default porosity for a sand soil type as implemented in USEPA (2004).
Moisture-Filled Porosity, ε_m	0.054	Default moisture-filled porosity for a sand soil type, as implemented in USEPA (2004).
Vapor-Filled Porosity, ε_v	0.321	Vapor-filled porosity, $\varepsilon_v = \varepsilon_T / 100 - \varepsilon_m$
Dry Bulk Soil Density, ρ_{db} (g/cm³)	1.66	Default dry bulk density for a sand soil type, as implemented in USEPA (2004).
Vadose Zone Temperature (°C)	11	Based on average shallow groundwater temperature in the Ohio, as presented in USEPA (2004; Figure 8).
Depth Below Grade to Water Table, L_{WT} (m)	3.08	Based on the geometric mean depth to groundwater at the Site of 3.08 m as presented in Table B.2.
Building Properties:		
Enclosed Floor Space Length, L_B (m)	10	Based on default building dimensions of 10 m x 10 m, as indicated in USEPA (2004).
Enclosed Floor Space Width, W_B (m)	10	Based on default building dimensions of 10 m x 10 m, as indicated in USEPA (2004).
Enclosed Space Height, H_B (m)	2.44	Based on a default commercial building ceiling height of 2.44 m, as indicated in USEPA (2004).
Building Air Exchange Rate, T_{air} (1/hr)	0.83	Industrial indoor air exchange rate, as indicated in ASTM (1995).
Ratio of Crack Area to Below-Grade Area, h (%)	0.038	Default crack ratio for slab-on-grade structures, as indicated in USEPA (2004).
Foundation Thickness, L_{crack} (cm)	15	Assumed based on default floor slab thickness of 15 cm (6 inches), as presented in USEPA (2004).
Depth Below Grade to Bottom of Enclosed Space Floor, L_F (cm)	15	Based on a typical slab depth of 0.15 m below grade, as indicated in USEPA (2004).
Average Vapor Flow Rate Into Building, Q_{soil} (L/min)	5	Default average vapor flow rate into building, as indicated in USEPA (2004).

(4) The exposure point concentration in the building is calculated from, $C_{building} = C_{gw} * \alpha * (H_L / (T*R)) * CF$, where T is the vadose zone temperature in Kelvin, the universal gas constant R is 8.206E-05 atm m³/ mol K, and conversion factor of 1000 L/m³.

TABLE C.5

DERIVATION OF INDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM ON-SITE GROUNDWATER - OFF-SITE RESIDENT INDOOR AIR INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Chemicals of Potential Concern (COPC)	Chemical Properties (1): Henry's Law Constant, H_L (atm m³/mol)	Chemical Properties (1): Water Diffusion Coefficient, D^{H_2O} (cm²/s)	Chemical Properties (1): Air Diffusion Coefficient, D^{air} (cm²/s)	Groundwater Concentration C_{gw} (2) (µg/L)	Johnson & Ettinger Attenuation Factor α (3)	Indoor Air EPC in Building $C_{building}$ (4) (µg/m³)	Indoor Air EPC in Building $C_{building}$ (4) (µg/m³)
VOCs							
1,1-Dichloroethane	3.02E-03 (11°C)	1.05E-05 (25°C)	6.90E-02 (11°C)	2.14E+02	1.04E-03	2.90E+01	2.90E-02
1,2-Dichloroethane	4.81E-04 (11°C)	9.90E-06 (25°C)	9.68E-02 (11°C)	1.41E+00	1.33E-03	3.85E-02	3.85E-05
Benzene	2.82E-03 (11°C)	9.80E-06 (25°C)	8.19E-02 (11°C)	1.07E+01	1.17E-03	1.51E+00	1.51E-03
Chlorobenzene	1.63E-03 (11°C)	8.70E-06 (25°C)	6.79E-02 (11°C)	2.03E+00	1.04E-03	1.48E-01	1.48E-04
Chloroform	1.95E-03 (11°C)	1.00E-05 (25°C)	9.68E-02 (11°C)	5.59E-01	1.30E-03	6.09E-02	6.09E-05
cis-1,2-Dichloroethene	2.14E-03 (11°C)	1.13E-05 (25°C)	6.85E-02 (11°C)	9.51E+01	1.04E-03	9.11E+00	9.11E-03
Dibromochloromethane	4.45E-04 (11°C)	1.05E-05 (25°C)	1.82E-02 (11°C)	1.00E+00	4.40E-04	8.40E-03	8.40E-06
Ethylbenzene	3.38E-03 (11°C)	7.80E-06 (25°C)	6.98E-02 (11°C)	1.98E+00	1.05E-03	3.02E-01	3.02E-04
Methylene chloride	1.22E-03 (11°C)	1.17E-05 (25°C)	9.40E-02 (11°C)	1.27E+00	1.28E-03	8.49E-02	8.49E-05
Tetrachloroethene	8.30E-03 (11°C)	8.20E-06 (25°C)	6.70E-02 (11°C)	5.44E-01	1.02E-03	1.97E-01	1.97E-04
Trichloroethene	5.05E-03 (11°C)	9.10E-06 (25°C)	7.35E-02 (11°C)	8.67E+01	1.09E-03	2.04E+01	2.04E-02
Vinyl chloride	1.78E-02 (11°C)	1.23E-05 (25°C)	9.86E-02 (11°C)	1.99E+01	1.31E-03	1.98E+01	1.98E-02
Xylene (total)	2.87E-03 (11°C)	9.34E-06 (25°C)	6.64E-02 (11°C)	2.01E+00	1.02E-03	2.52E-01	2.52E-04
SVOCs							
2-Methylnaphthalene	1.34E-04 (11°C)	7.75E-06 (25°C)	4.86E-02 (11°C)	1.97E+00	9.47E-04	1.07E-02	1.07E-05
Naphthalene	1.65E-04 (11°C)	7.50E-06 (25°C)	5.49E-02 (11°C)	9.39E-01	9.90E-04	6.57E-03	6.57E-06

Notes:

(1) The applied chemical properties are obtained from the chemical properties database implemented in USEPA (2004). Chemical properties data for cis-1,2-dichloroethylene were applied as surrogate values for 1,2-dichloroethylene (total). The Henry's Law constants and air diffusion coefficients were corrected for an average vadose zone temperature of 11°C. The reference temperature for the water diffusion coefficients is 25°C and, considering its low value, a correction to 11°C was considered negligible.

(2) For RME groundwater concentrations, refer to Table B.3.6.

(3) The soil gas attenuation factor α is based on the solution for soil gas migration to building indoor air presented in Johnson and Ettinger [1991; Equation (21)], the vadose zone and building properties listed below, and a 4 Pa pressure difference between the vadose zone and the building (ΔP) as applied by USEPA (2004). The calculation of the soil gas attenuation factor was conducted using a modified version of the Excel spreadsheet "GW-ADV-Feb04.xls" developed by USEPA (2004). The following vadose zone and building properties were also applied.

TABLE C.5

DERIVATION OF INDOOR AIR EXPOSURE POINT CONCENTRATIONS FROM ON-SITE GROUNDWATER - OFF-SITE RESIDENT INDOOR AIR INHALATION EXPOSURE
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Vadose Zone Soil Properties:		
Total Porosity, ε_T (%)	37.5	Default porosity for a sand soil type as implemented in USEPA (2004).
Moisture-Filled Porosity, ε_m	0.054	Default moisture-filled porosity for a sand soil type, as implemented in USEPA (2004).
Vapor-Filled Porosity, ε_v	0.321	Vapor-filled porosity, $\varepsilon_v = \varepsilon_T / 100 - \varepsilon_m$
Dry Bulk Soil Density, ρ_{db} (g/cm^3)	1.66	Default dry bulk density for a sand soil type, as implemented in USEPA (2004).
Vadose Zone Temperature (°C)	11	Based on average shallow groundwater temperature in the Ohio, as presented in USEPA (2004; Figure 8).
Depth Below Grade to Water Table, L_{WT} (m)	3.08	Based on the geometric mean depth to groundwater at the Site of 3.08 m as presented in Table B.2.
Building Properties:		
Enclosed Floor Space Length, L_B (m)	10	Based on default building dimensions of 10 m x 10 m, as indicated in USEPA (2004).
Enclosed Floor Space Width, W_B (m)	10	Based on default building dimensions of 10 m x 10 m, as indicated in USEPA (2004).
Enclosed Space Height, H_B (m)	3.66	Based on a default building mixing height for a building with a basement of 3.66 m, as indicated in USEPA (2004).
Building Air Exchange Rate, T_{air} (1/hr)	0.25	Default indoor air exchange rate, as indicated in USEPA (2004).
Ratio of Crack Area to Below-Grade Area, h (%)	0.02	Default crack ratio for basement structures, as indicated in USEPA (2004).
Foundation Thickness, L_{crack} (cm)	15	Assumed based on default floor slab thickness of 15 cm (6 inches), as presented in USEPA (2004).
Depth Below Grade to Bottom of Enclosed Space Floor, L_F (cm)	200	Based on a typical basement depth of 2 m below grade, as indicated in USEPA (2004).
Average Vapor Flow Rate Into Building, Q_{soil} (L/min)	5	Default average vapor flow rate into building, as indicated in USEPA (2004).

(4) The exposure point concentration in the building is calculated from, $C_{building} = C_{gw} * \alpha * (H_L / (T*R)) * CF$, where T is the vadose zone temperature in Kelvin, the universal gas constant R is 8.206E-05 atm m^3/ mol K, and conversion factor of 1000 L/m^3.

TABLE OF CONTENTS

Page

1.0 INTRODUCTION D-1

2.0 STATISTICAL PROCEDURES FOR SELECTION OF EPC METHODS D-2
2.1 PERCENTAGE OF CENSORED DATA (NON-DETECTS) D-2
2.2 DATA PRE-PROCESSING FOR ELEVATED DETECTION LIMITS D-2
2.3 DATA DISTRIBUTION TESTING D-3
2.3.1 NORMAL DISTRIBUTION TESTING D-3
2.3.2 GAMMA DISTRIBUTION TESTING D-4
2.3.3 LOGNORMAL DISTRIBUTION TESTING D-6
2.4 SELECTION OF 95 PERCENT UCL METHODS D-6

3.0 95 PERCENT UPPER CONFIDENCE LIMIT (UCL) CALCULATION METHODS D-7
3.1 UN-DETECTED ANALYTES (100 PERCENT NON-DETECT DATA SETS), SMALL DATA SETS (N < 5), AND FEW DETECTED VALUES (< 4) D-7
3.2 STUDENT'S-T UCL (ALL DATA DETECTED VALUES) D-8
3.3 STUDENT'S-T UCL (DATA SETS CONTAINING NON-DETECTS) D-8
3.4 APPROXIMATE GAMMA UCL D-10
3.5 ADJUSTED GAMMA UCL D-10
3.6 BOOTSTRAP-T UCL D-10
3.7 HALL'S BOOTSTRAP UCL D-11
3.8 LAND'S-H UCL D-12
3.9 UCLS BASED ON THE CHEBYSHEV INEQUALITY D-13
3.9.1 CHEBYSHEV UCLS BASED ON SAMPLE MEAN AND STANDARD DEVIATION (DETECTED DATA) D-13
3.9.2 CHEBYSHEV UCLS BASED ON SAMPLE MEAN AND STANDARD DEVIATION (DATA SETS CONTAINING NON-DETECTS) D-13
3.10 PERCENTILE BOOTSTRAP UCLS (DATA SETS CONTAINING NON-DETECTS) D-14
3.11 BIAS-CORRECTED ACCELERATED (BCA) BOOTSTRAP UCLS (DATA SETS CONTAINING NON-DETECTS) D-14

4.0 MAXIMUM DETECTED VALUE D-16

5.0 REFERENCES D-17

LIST OF FIGURES
(Following Text)

FIGURE 1 UCL METHODS DECISION FLOWCHART

LIST OF TABLES
(Following Text)

TABLE 1 COEFFICIENTS a_i FOR THE SHAPIRO-WILK W-TEST OF NORMALITY

TABLE 2 CRITICAL VALUES (W_{crit}) FOR THE SHAPIRO-WILK W-TEST OF NORMALITY

TABLE 3 CRITICAL VALUES (D_{crit}) FOR THE KOLMOGOROV-SMIRNOV TEST OF GAMMA DISTRIBUTION (α= 0.05)

TABLE 4 CRITICAL VALUES (A^2_{crit}) FOR THE ANDERSON-DARLING TEST OF GAMMA DISTRIBUTION (α= 0.05)

TABLE 5a INITIAL SCREENING FOR SMALL OR HIGHLY CENSORED DATA SETS, AND TREATMENT OF ELEVATED DETECTION LIMITS

TABLE 5b STATISTICAL METHODS USED FOR DETERMINING 95 PERCENT UPPER CONFIDENCE LIMITS (UCLs) FOR DATA SETS WITHOUT NONDETECT OBSERVATIONS

TABLE 5c STATISTICAL METHODS USED FOR DETERMINING 95 PERCENT UPPER CONFIDENCE LIMITS (UCLs) FOR DATA SETS WITH NONDETECT OBSERVATIONS

TABLE 6 VALUES OF THE CUMULATIVE CHI-SQUARE (X^2) DISTRIBUTION (α = 0.05)

TABLE 7 SIGNIFICANCE LEVELS (α') FOR ADJUSTED GAMMA UCL CALCULATIONS

TABLE 8 VALUES OF $H_{0.95}$ FOR LAND'S H-UCL METHOD

TABLE 9 Z-SCORES FOR THE STANDARD NORMAL DISTRIBUTION

1.0 INTRODUCTION

A key element of the risk assessment process is the estimation of the concentration of a chemical in the environment (USEPA, 2002). The concentration used is termed the exposure point concentration (EPC), which is a conservative estimate of the average concentration within an environmental medium (USEPA, 2002).

The EPCs applied in the risk assessment process were developed based on the reasonable maximum exposure (RME) scenario. In this scenario, a conservative 95 percent upper confidence limit (UCL) of the mean was used as an estimate of the exposure term. The determination of 95 percent UCLs are statistically based and driven by characteristics of the data. Key factors determining the statistical methodologies employed include: (i) the probability distribution of the observed data (e.g., normal vs. gamma-distributed vs. lognormal, etc.); and (ii) the proportion of censored data (non-detected results) present.

The following sections present the procedures used to determine the 95 percent UCL values of the contaminants of concern (COPCs) in this risk assessment. A number of guidance documents were consulted in developing the statistical methodologies including USEPA (1989), USEPA (1992) updated by USEPA (2002), USEPA (1997), USEPA (2003), USEPA (2006a), USEPA (2006b), USEPA (2009a), USEPA (2009b), and MOE (1997).

The 95 percent UCL methods used have been selected to be consistent with USEPA's ProUCL Version 4.00.04 software, which was released on May 13, 2009. The methods incorporated in this software are described in USEPA (2009a, 2009b), which have been used as the primary reference documents for the UCL methodologies.

The EPC calculation methodologies employed are discussed in the following sections:

- Section 1.0 Introduction
- Section 2.0 Statistical Procedures for Selecting UCL Methods
- Section 3.0 UCL Calculation Methods
- Section 4.0 Maximum Detected Value
- Section 5.0 References

2.0 STATISTICAL PROCEDURES FOR SELECTION OF EPC METHODS

The development of EPC estimates is performed for each COPC separately using a four step process consisting of: (i) determining the percentage of non-detects present, (ii) pre-screening data for elevated detection limits, (iii) data distribution testing, and (iv) selecting and implementing an appropriate statistical method for EPC estimate calculations.

2.1 PERCENTAGE OF CENSORED DATA (NON-DETECTS)

The first step of the statistical evaluation is to determine the percentage of the non-detects present in each data set. Suggested approaches to account for the presence of non-detect analytical results are outlined in USEPA (2009a, 2006b). The primary technique recommended to account for non-detects in data sets is the Kaplan-Meier (KM) product limit estimation method (Kaplan & Meier, 1958). This procedure is described in detail in Section 3.3 below, and uses the numerical values of the detected results in conjunction with the proportions of non-detect results at different detection limits in order to determine estimates of the population mean and standard error for use in UCL calculations. USEPA (2009a, 2006b) recommends different UCL computation methods based on the level of non-detects present, as well as other data distribution characteristics, as indicated in Section 2.3 below.

2.2 DATA PRE-PROCESSING FOR ELEVATED DETECTION LIMITS

The second step of the analysis screens the data set for the presence of data consisting of non-detect results with elevated detection limits. Such data are of limited value in EPC determination, since they have high uncertainty associated with them (i.e., the analyte may or may not be present at a concentration between zero and the high detection limit). In such cases, where sufficient additional data points (detected values or non-detects with lower detection limits), the high detection limit data may be removed from the data set prior to UCL calculations applying the following logic:

- For data sets with 10 or fewer data points, all data are retained
- For data sets with between 10 and 100 data points, and containing up to 25 percent non-detect results with elevated detection limits, the high detection limit data are removed from UCL calculations

- For data sets with greater than 100 data points, and containing up to 50 percent non-detect results with elevated detection limits, the high detection limit data are removed from UCL calculations

2.3 DATA DISTRIBUTION TESTING

The third step in determining an appropriate UCL method for each data set is to determine the statistical data distribution. Each data set is classified as being described by one of the following distributions (in descending order). In any cases where the data fit more than one distribution, the distribution highest on this list is selected (e.g., if a set of data may be described by either a normal or lognormal distribution based on testing, a normal distribution assumption is made), unless further testing is performed to demonstrate that one distribution fits the data better than the others.

i) Normal Distribution

ii) Gamma Distribution

iii) Lognormal Distribution

iv) None of the above (in which case a non-parametric UCL is required)

Details regarding the distribution testing needed for each of these methods are given in the following sections.

2.3.1 NORMAL DISTRIBUTION TESTING

To test a data set for normality, the Shapiro-Wilk W-test (1965), which was later extended for large sample sizes by Royston, (1982), was used. This test is statistically robust and is considered one of the best numerical tests of normality. The test is especially sensitive to detecting deviations in the extreme tails of the distribution. The following steps are employed to perform the Shapiro-Wilk W-test:

i) The sample data are ordered from smallest to largest

ii) A weighted sum (b) of differences between the most extreme observations is calculated

$$b = \sum_{i=1}^{k} a_{(n-i+1)}(x_{(n-i+1)} - x_i) = \sum_{i=1}^{k} b_i$$

where:

x_i is the smallest ordered value in the sample

n is the number of samples

k is the largest integer less than or equal to $n/2$

a_i is a coefficient from standard tables dependent on the sample size n

A table of a_i coefficients is attached to this Appendix (Table 1)

iii) The weighted sum is divided by a multiple of the standard deviation (S) to yield the Shapiro-Wilk statistic (W)

$$W = \left\{ \frac{b}{S\sqrt{n-1}} \right\}^2$$

iv) The calculated W is compared against a critical value (W_{crit}) taken from a standard statistical table (see Table 2). If W is greater than W_{crit} then the data are concluded to be normally distributed at the selected level of significance

2.3.2 GAMMA DISTRIBUTION TESTING

Gamma parameter estimation and distribution testing were performed using the methods presented in the ProUCL 4.00.04 Technical Guide (USEPA, 2009a), including the Kolmogorov-Smirnov and Anderson-Darling tests.

Prior to performing a test of goodness-of-fit for the gamma distribution, two gamma parameters must be determined. These parameters are: (i) the shape parameter κ; and (ii) the scale parameter θ. Estimation of the parameters is performed as described in Section 2.3.2 of the Draft ProUCL 4.00.04 Technical Guide (USEPA, 2009a). Specifically, the maximum likelihood estimators were calculated as follows.

Step 1) Define an approximation of the Digamma function $\Psi(\kappa)$ as:

$$\Psi(\kappa) \approx \ln(\kappa) - \left\{1 + \left[1 - (1/10 - 1/(21\kappa^2))/\kappa^2\right]/(6\kappa)\right\}/(2\kappa) \qquad \text{for } \kappa \geq 8\text{; and}$$

$$\Psi(\kappa) = \Psi(\kappa+1) - 1/\kappa \qquad \text{for } \kappa < 8 \text{ (iterative formula)}$$

Step 2) Define an approximation of the Trigamma function $\Psi'(\kappa)$ as:

$$\Psi'(\kappa) \approx \left\{1 + \left\{1 + \left[1 - (1/5 - 1/(7\kappa^2))\right]/(3\kappa)\right\}/(2\kappa)\right\}/\kappa \qquad \text{for } \kappa \geq 8\text{; and}$$

$$\Psi'(\kappa) = \Psi'(\kappa+1) - 1/\kappa^2 \qquad \text{for } \kappa < 8 \text{ (iterative formula)}$$

Step 3) Define an initial estimate of κ as:

$$\kappa_0 = 1/2M \qquad \text{where,}$$

$$M = \ln(\bar{x}) - \frac{1}{n}\sum \ln(x_i)$$

Step 4) Solve for κ iteratively using the following formula until convergence occurs (typically fewer than 10 iterations for convergence to 5+ significant figures).

$$\hat{\kappa}_l = \hat{\kappa}_{l-1} - \frac{\ln(\hat{\kappa}_{l-1}) - \Psi(\hat{\kappa}_{l-1}) - M}{1/\hat{\kappa}_{l-1} - \Psi'(\hat{\kappa}_{l-1})}$$

Step 5) Calculate θ using the relationship:

$$\hat{\theta} = \bar{x} / \hat{\kappa}$$

where $\bar{x}$ is the mean of the data set.

These estimated expected values (designated by the ^ character over κ and θ, and termed "k hat" and "Theta hat", respectively, in ProUCL Version 4.00.04 guidance) are used in the data distribution testing below, and in the gamma UCL calculations presented in Section 3.

The Kolmogorov-Smirnov and Anderson-Darling goodness-of-fit tests are empirical distribution function (EDF) tests that can be used to test a gamma distribution (as well as other distributions). The steps in performing these tests using the gamma parameters calculated above are as follow:

Step 1) Let F(x) be the cumulative distribution function (CDF) of the gamma random variable X. Let Z=F(X), where Z represents a uniform U(0,1) random variable. For each data point x_i compute z_i using the incomplete gamma function

$$z_i = F(x_i) \qquad ; i=1,2,\ldots,n$$

Note that the incomplete gamma function is available using the Microsoft Excel GAMMADIST function with x_i, κ and θ as arguments. It may alternatively be calculated using the algorithm in Press et al. (1990), the details of which are not provided here.

Step 2) Arrange the resulting z_i in ascending order as $z_1 \leq z_2 \leq \ldots \leq z_n$

Let $\bar{z} = \sum z_i / n$ be the mean of the z_i; i=1,2,...,n.

Step 3) For the Kolmogorov-Smirnov test, calculate the following two test statistics:

$$D^+ = \max_i \{1/n - z_i\} \qquad \text{and} \qquad D^- = \max_i \{z_i - (i-1)/n\}$$

Then, the Kolmogorov-Smirnov test statistic is given by $D = \max(D^+, D^-)$.

Step 4) For the Anderson-Darling test, calculate the following test statistic:

$$A^2 = -n - (1/n)\sum_{1}^{n} \{(2i-1)[\log(z_i) + \log(1 - z_{(n+1-i)})]\}$$

Step 5) Compare the D and A^2 statistics to tabulated critical values (Tables 3 and 4). If the calculated values (from Steps 3 and 4) are less than the tabulated critical values, then the data are gamma distributed. If the calculated values are greater than the tabulated critical values, then the hypothesis of a gamma distribution is rejected.

2.3.3 LOGNORMAL DISTRIBUTION TESTING

Testing for a lognormal distribution is carried out by transforming the original data set by taking the natural logarithms ($\log_e$ or ln) of the data and then applying the Shapiro-Wilk W-test as described for the normal distribution above (Section 2.3.1).

2.4 SELECTION OF 95 PERCENT UCL METHODS

Methods for determining the 95 percent UCL values are discussed in USEPA (2002) (which updates USEPA 1992), USEPA (2004), USEPA (2006b), USEPA (2009a), and USEPA (2009b). Recommended 95 percent UCL methods are available in the ProUCL Version 4.00.04 Technical and User Guides (USEPA, 2009a,b). These recommendations have been followed in the selection of 95 percent UCL methods.

A UCL method decision flowchart is presented on Figure 1, which illustrates the decision process described in Table 5a, 5b, and 5c to determine which 95 percent UCL method is appropriate to use.

3.0 95 PERCENT UPPER CONFIDENCE LIMIT (UCL) CALCULATION METHODS

The following sections discuss the calculation procedures used to produce 95 percent UCL estimates. The selection of an appropriate method for each data set is presented above in Section 2.

3.1 UN-DETECTED ANALYTES (100 PERCENT NON-DETECT DATA SETS), SMALL DATA SETS (N < 5), AND FEW DETECTED VALUES (< 4)

In most cases for chemicals that have not been detected in an environmental medium, such analytes are not considered as COPCs under USEPA's Risk Assessment Guidance for Superfund (RAGS, USEPA 1989). However, when a non-detected analyte must be retained as a COPC for other site-specific reasons (e.g., a primary component of a waste stream), USEPA (2009b) recommends using the maximum reporting limit (RL) for the EPC value. This approach has been applied, subject to screening for atypically high detection limits occurring infrequently (i.e., no more than once in twenty observations) in the data set.

In cases where the number of data points is small (fewer than 5 observations), statistics are not considered reliable and USEPA (2009a,b) recommends that the maximum value (detect or reported detection limit) be used. Note that the uncertainties in this case (i.e., a small data set containing few detected values) are high, and it is always recommended to collect more samples in order to better characterize the study area.

For data sets containing five or more observations, but having only four or fewer detected values, special treatment is recommended by USEPA (2009a) in determining EPCs:

- For 0 to 1 detected values, no statistics are possible, and a UCL is not calculable. In these cases, the maximum value (detect or detection limit) is used as the EPC.
- For 2 detected values, KM procedures only should be applied to any UCL method selected.
- For 3 detected values, most statistical calculations should be performed, but not using gamma distribution methods.

USEPA also makes a general recommendation that efforts should be made to collect a data set with approximately 8 to 10 detected observations minimum.

The approaches described above have been followed during EPC calculations for data sets containing high percentages of non-detects and for small data sets. The details of all the procedures used are shown in Table 5a.

3.2 STUDENT'S-*t* UCL (ALL DATA DETECTED VALUES)

The arithmetic mean and standard deviation of the data are calculated, and the 95 percent UCL value is found using the following equation.

$$95\%\text{UCL} = \bar{x} + t_{(0.05,n-1,1)} \bullet s / \sqrt{n}$$

where:

$\bar{x}$	=	mean of the substituted data set
$t_{(0.05,\, n-1,\, 1)}$	=	student *t*-statistic for a one-tailed 95 percent confidence (α=0.05) and n-1 degrees of freedom
s	=	standard deviation of the substituted data set
n	=	number of samples

3.3 STUDENT'S-*t* UCL (DATA SETS CONTAINING NON-DETECTS)

For data sets containing non-detect data, the Kaplan-Meier (KM) method is used to generate estimates of the population mean ($\hat{\mu}$) and its standard error ($\hat{\sigma}_{SE}$) as follow:

Let $x_1, x_2, \ldots, x_n$ represent n observed values obtained from samples collected.
Let $x'_1, < x'_2, \ldots, < x'_{n'}$ denote the n' distinct COPC concentrations observed.
Therefore, $n' < n$.

Let m_j denote the number of detects at x'_j.
Let n_j represent n data values detected in samples collected at x_j.

Step 1) Define a cumulative distribution function $\widetilde{F}(x)$ as:

$$\widetilde{F}(x) = 1, \quad when\, x \geq x'_{n'}$$

$$\widetilde{F}(x) = \prod_{j\ such\ that\ x'_j > x} \frac{m_j - n_j}{n_j}, \quad when\ x'_1 \leq x \leq x'_{n'}$$

$$\widetilde{F}(x) = \widetilde{F}(x'_1), \quad when\ x_{(1)} \leq x \geq x'_1$$

$$\widetilde{F}(x) = 0\ or\ undefined, \quad when\ 0 \leq x \geq x_{(1)}$$

Step 2) Calculate the KM population mean $(\hat{\mu})$ as:

$$\hat{\mu} = \sum_{i=1}^{n'} x'\left[\widetilde{F}(x'_i) - \widetilde{F}(x'_{i-1})\right], where, x_0 = 0.$$

Step 3) Calculation of the KM standard error $(\hat{\sigma}_{SE})$ of the mean as:

$$\hat{\sigma}_{SE} = \sqrt{\frac{n-k}{n-k-1} \sum_{i=1}^{n'-i} a_i^2 \frac{m_{i+1}}{n_{i+1}(n_{i+1} - m_{i+1})}}$$

where:

k = the number of observations below the detection limit and

$$a_i = \sum_{j=1}^{i} (x'_{j+1} - x'_j)\widetilde{F}(x'_j), \quad i := 1,2,\ldots,n'-1.$$

The calculation of a 95 percent UCL using these Kaplan-Meier estimates is then accomplished using the following equation:

$$95\%\text{UCL} = \hat{\mu} + t_{(0.05,n-1,1)} \bullet \hat{\sigma}_{SE}$$

where:

$\hat{\mu}$ = Kaplan-Meier estimate of the population mean (see above)

$t_{(0.05,\ n-1,\ 1)}$ = student t-statistic for a one-tailed 95 percent confidence (α=0.05) and n-1 degrees of freedom

$\hat{\sigma}_{SE}$ = Kaplan-Meier estimate of the population standard error (see above)

3.4 APPROXIMATE GAMMA UCL

To calculate the Approximate Gamma UCL, the following formula is used:

$$UCL = 2n\hat{k}^{*}\bar{x} / \mathrm{X}^{2}_{2n\hat{k}^{*}}(\alpha)$$

where:

n	=	the number of samples
$\hat{k}^{*}$	=	the bias-corrected estimate of $\hat{k}$; $\hat{k}^{*} = (n-3)\hat{k}/n + 2/(3n)$
$\bar{x}$	=	the sample mean
$\mathrm{X}^{2}_{2n\hat{k}^{*}}(\alpha)$	=	the cumulative chi-square distribution at α (=0.05 for a 95 percent confidence limit) with $2n\hat{k}^{*}$ degrees of freedom (e.g., interpolated from Table 6).

3.5 ADJUSTED GAMMA UCL

To calculate the Adjusted Gamma UCL, the following formula is used:

$$UCL = 2n\hat{k}^{*}\bar{x} / \mathrm{X}^{2}_{2n\hat{k}^{*}}(\alpha')$$

which is the same formula as for the Approximate Gamma UCL above, but an adjusted level of α, α', is used based on the values found in, or interpolated from, Table 7.

3.6 BOOTSTRAP-*t* UCL

To calculate the UCL based on the Bootstrap-*t* method, the following steps are performed:

Step 1) Calculate estimates of the population mean $\hat{\mu}$ and its standard error $\hat{\sigma}_{SE}$ using the KM method as described previously.

Step 2) Re-sample the original data a very large number of times (in this case thousands of times) using a sample size equal to the original number of samples and calculate each resample set's estimated population mean ($\hat{\mu}_b$) and standard deviation ($\hat{\sigma}_{SEb}$), using the KM methods.

Step 3) For each re-sample set calculate the value.

$$t_b = \frac{(\hat{\mu}_b - \hat{\mu})}{\sigma_{SEb}} \times \sqrt{n}$$

where n is the number of samples.

Step 4) Sort the t_b values from the lowest to the highest, and select the pivotal quantity $t_{(\alpha N)}$, where N is the number of bootstrap sets. For example, if 10,000 bootstrap sets are generated and α=0.05, select the 500th (0.05 x 10000) lowest t_b value.

Step 5) Calculate the Bootstrap-t 95 percent UCL estimate as:

$$95\%\text{UCL} = \hat{\mu} - t_{(\alpha N)} \bullet \frac{\sigma_{SE}}{\sqrt{n}}$$

where:

$\hat{\mu}$ = KM estimate of the population mean
$\hat{\sigma}_{SE}$ = KM estimate of the standard error of the population mean
n = sample size
$t_{(\alpha N)}$ = is the pivotal quantity defined in Step (4)

3.7 HALL'S BOOTSTRAP UCL

To calculate a Hall's Bootstrap UCL, a number of steps are required, as follow:

Step 1) Compute the arithmetic mean ($\bar{x}$).

Step 2) Compute the standard deviation (s).

Step 3) Compute the skewness (k).

Step 4) Re-sample the data a very large number of times (thousands of re-sample sets were used during EPC calculations) selecting the same number of re-sampled data each time equal to the number of samples in the initial data set. Calculate each bootstrap set's mean $\bar{x}_b$, standard deviation s_b and skewness k_b.

Step 5) For each bootstrap set, calculate the studentized mean (W_b):

$$W_b = \frac{(\bar{x}_b - \bar{x})}{s_b}$$

Step 6) For each bootstrap set, calculate Hall's statistic:

$$Q_b = W + \frac{k_b W^2}{3} + \frac{k_b^2 W^3}{27} + \frac{k_b}{6n}$$

Step 7) Sort all the Q_b values (lowest to highest) and select the lower α^{th} quantile ($Q\alpha$) of the B re-sample sets. This is the $(\alpha B)^{th}$ lowest value (e.g., for 10,000 resample sets and α=0.05, select $Q\alpha$ = the 500th lowest value).

Step 8) Compute the following quantity:

$$W(Q_\alpha) = \frac{3}{k}\left[\sqrt[3]{1 + \left(Q_\alpha - \frac{k}{6n}\right)} - 1\right]$$

where n is the number of samples.

Step 9) Compute the one-sided $(1-\alpha)$ upper confidence limit on the mean as:

$$UCL_{1-\alpha} = \bar{x} - W(Q_\alpha)s.$$

In calculating Hall's bootstrap, five replicate calculations of the 10,000 resample sets each were generated, and the median UCL value used. These replicates were used to determine whether or not each given data set was sensitive to small differences with the random re-sampling algorithm used during calculations.

3.8 LAND'S-H UCL

Land's-H UCL is calculated as follows:

Step 1) Compute the arithmetic mean $\bar{x}_{\log}$ of the natural log-transformed data.

Step 2) Compute the standard deviation $s_{\log}$ of the natural log-transformed data.

Step 3) Look up the $H_{1-\alpha}$ statistic from Table 8.

Step 4) Compute the one-sided $(1-\alpha)$ upper confidence limit on the mean as:

$$UCL_{1-\alpha} = e^{\left(\bar{x}_{\log} + \frac{s_{\log}^2}{2} + \frac{H_{1-\alpha} s_{\log}}{\sqrt{n-1}}\right)}$$

where n is the number of samples.

3.9 UCLs BASED ON THE CHEBYSHEV INEQUALITY

3.9.1 CHEBYSHEV UCLs BASED ON SAMPLE MEAN AND STANDARD DEVIATION (DETECTED DATA)

Non-parametric (rank-based) UCLs for data sets containing no non-detect data are calculated using the Chebyshev inequality as follows:

Step 1) Compute the sample mean $(\bar{x})$ and standard deviation (s).

Step 2) Calculate the one-sided (1 - α) upper confidence limit of the mean as:

$$\text{UCL} = \bar{x} + \sqrt{((1/\alpha)-1)}\, s/\sqrt{n}$$

Where n is the number of samples and α=0.05 for a one-sided 95 percent UCL.

3.9.2 CHEBYSHEV UCLs BASED ON SAMPLE MEAN AND STANDARD DEVIATION (DATA SETS CONTAINING NON-DETECTS)

When non-detect data area present, the non-parametric Chebyshev 95 percent UCL is obtained by first finding estimates of the population mean $(\hat{\mu})$ and its standard error $(\hat{\sigma}_{SE})$ using the Kaplan-Meier procedure (see Section 3.3 above). These values are used in place of the sample mean $(\bar{x})$ and standard deviation (s) in the equation above, as shown below.

$$\text{UCL} = \hat{\mu} + \sqrt{((1/\alpha)-1)}\, \hat{\sigma}_{SE}/\sqrt{n}$$

3.10 PERCENTILE BOOTSTRAP UCLs (DATA SETS CONTAINING NON-DETECTS)

To calculate the 95 percent UCL using the Percentile Bootstrap method, the following steps are followed:

Step 1) Re-sample the original data a very large number of times (thousands of resamples were used for EPC calculations) using a sample size equal to the original number of samples, and calculate each resample set's estimated population mean ($\hat{\mu}_b$) using the KM method (see Section 3.3).

Step 2) Sort the $\hat{\mu}_b$ values from the lowest to the highest.

Step 3) Select the Percentile Bootstrap 95 percent UCL as:

$$95\% \text{ UCL} = \hat{\mu}_{(0.95 \cdot N)}$$

where:

$\hat{\mu}_{(0.95 \cdot N)}$ = is the 0.95xNth ordered estimate of $\hat{\mu}_b$ out of N bootstrap sets

For example, when N = 1000, a percentile bootstrap 95%UCL (e.g., based upon KM method) is given by the 950th ordered bootstrap estimate of $\hat{\mu}_b$.

3.11 BIAS-CORRECTED ACCELERATED (BCA) BOOTSTRAP UCLs (DATA SETS CONTAINING NON-DETECTS)

To calculate the UCL based using the Bias-Corrected Accelerated (BCA) Percentile Bootstrap procedure, the following steps are required:

Step 1) Re-sample the original data a very large number of times (thousands of resamples were used for EPC calculations) using a sample size equal to the original number of samples and calculate each resample set's estimated population mean ($\hat{\mu}_b$) using the KM method (see Section 3.3).

Step 2) Sort the $\hat{\mu}_b$ values from the lowest to the highest.

Step 3) Determine the number overall average ($\bar{x}$) of the N resample population mean estimates $\hat{\mu}_b$.

Step 4) Determine the bias correction ($\hat{z}_0$) as:

$$\hat{z}_0 = \Phi^{-1}\left[\frac{\#\left(\hat{\mu}_b < \bar{x}\right)}{N}\right] \quad ; i = 1,2,\ldots,N$$

where:

$\#\left(\hat{\mu}_b < \bar{x}\right)$ = the number of times the bootstrap mean is below the overall average

Φ^{-1} = the inverse of the standard normal cumulative distribution (from a *z*-score table, e.g., Table 9)

Step 5) Determine the acceleration factor ($\hat{\alpha}$) as:

$$\hat{\alpha} = \frac{\sum\left(\bar{x} - \bar{x}_{-i}\right)^3}{6 \cdot \left[\sum\left(\bar{x} - \bar{x}_{-i}\right)^2\right]^{1.5}}$$

where:

$\bar{x}_{-i}$ = the mean of the Kaplan-Meier population means ($\hat{\mu}_b$) for all resample sets excluding the ith bootstrap set

Step 6) Determine BCA order percentile α_2 as:

$$\alpha_2 = \Phi\left[\hat{z}_0 + \frac{\hat{z}_0 + z^{1-\alpha}}{1 - \hat{\alpha}\left(\hat{z}_0 + z^{1-\alpha}\right)}\right]$$

where:

Φ = the standard normal cumulative distribution (*z*-score) for the value in square parentheses

$z^{1-\alpha}$ = the $100(1-\alpha)^{th}$ percentile of the standard normal distribution

$\alpha_2, \hat{z}_0, \hat{\alpha}$ = have been previously defined above

Step 7) Select the $\alpha_2{}^{th}$ percentile (i.e., $\alpha_2 \times N^{th}$ value) of the ordered μ_b (from Step 2) as the 95 percent BCA Percentile Bootstrap UCL.

4.0 MAXIMUM DETECTED VALUE

USEPA (1992 and 2002) allow an optional use of the maximum observed concentrations for the EPC estimate in cases where the calculated UCL exceeds the maximum value. However, USEPA (2002) warns that this may not be appropriate for data sets with very small sample sizes, because the observed maximum may be below the population mean. USEPA (2007b) recommends against using the maximum observed concentration as the EPC value. For skewed data sets of small sample sizes ($n < 10$-20), the maximum concentration does not provide 95 percent coverage to the population mean, and for larger data sets, it overestimates the EPC value, potentially resulting in unnecessary remediation. Rather, where the UCL computed following the stated methods exceeds maximum value, USEPA (2009a,b) recommends the use of an alternative value based on the Chebyshev Inequality. The only exception to the noted is in cases in which all data are non-detects, in which case the maximum reporting limit may be used for the EPC.

5.0 REFERENCES

Gilbert, R.O., (1987). *Statistical Methods for Environmental Pollution Monitoring.* John Wiley & Sons, New York, 320p.

Kaplan, E.L & P. Meier, 1958. Nonparametric Estimation from Incomplete Observations. Journal of the American Statistical Association 53(282): 457-481.

Land, C.E., 1975. Tables of Confidence Limits for Linear Functions of the Normal Mean and Variance *in* Selected Tables in Mathematical Statistics, volume 3, eds H.L. Harter & D.B. Owen. Providence, Rhode Island: American Mathematical Society. pp. 385-419.

MOE, (1997). *Guidance on Site Specific Risk Assessment for Use at Contaminated Sites in Ontario.*

Press, W.H., Flannery, B.P., Teukolsky, S.A. & W.T. Vetterling, 1990. Numerical Recipes in C, The Art of Scientific Computing, 2nd edition. Cambridge, MA: Cambridge University Press.

Royston J.P. An Extension of Shapiro and Wilk's W Test for Normality to Large Samples. *Applied Statistics* 31(2): 115-124.

Shapiro, S.S. & M.B. Wilk, 1965. An Analysis of Variance Test for Normality (Complete Samples). Biometrika 52(3/4): 591-611.

USEPA, (1989). *Risk Assessment Guidance for Superfund (RAGS), Interim Final,* EPA/540/1-89/002, December 1989.

USEPA, (1992). U.S. EPA *Supplemental Guidance to RAGS: Calculating the Concentration Term,* OSWER Directive 9285.7-081, May 1992.

USEPA, (1997). *The Lognormal Distribution in Environmental Applications* EPA/600/R-97/006 December 1997.

USEPA, (2002). Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. Office of Emergency and Remedial Response, United States Environmental Protection Agency, Washington, DC, December 2002.

USEPA, (2003). *ProUCL User's Guide,* version 2.1, United States Environmental Protection Agency, Washington, DC, February 2003.

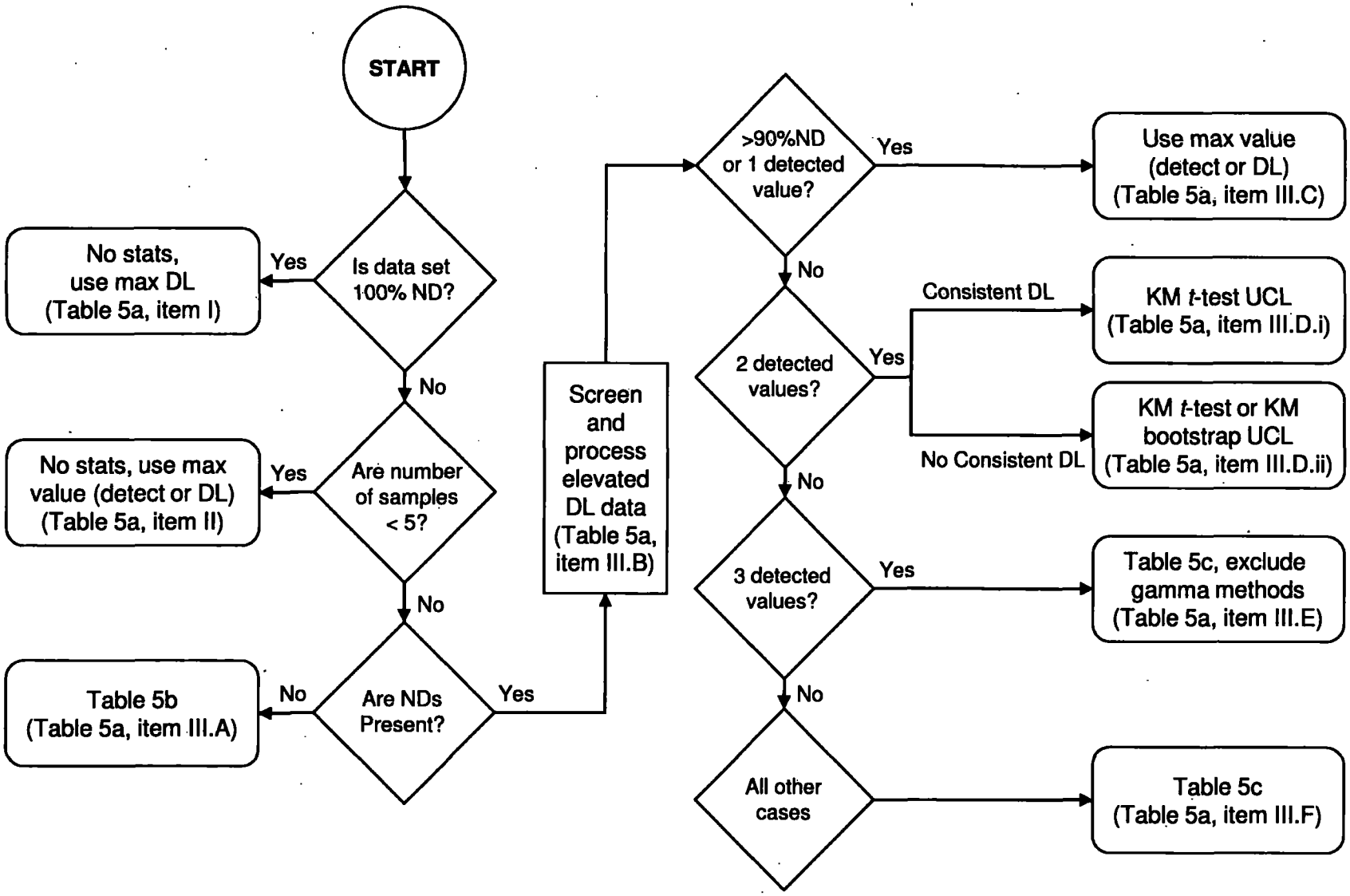
USEPA, (2004). ProUCL Users Guide Version 3.0. United States Environmental Protection Agency, Washington, DC, April 2004. EPA/600/R04/079.

USEPA, (2006a). Data Quality Assessment: Statistical Methods for Practitioners (EPA QA/G-9S). Office of Environmental Information, United States Environmental Protection Agency, Washington, DC. EPA/240/B-06/003.

USEPA, (2006b). On the Computation of a 95% Upper Confidence Limit of the Unknown Population Mean Based Upon Data Sets with Below Detection Limit Observations. Office of Research and Development, United States Environmental Protection Agency, Washington, DC. EPA/600/R06/022.

USEPA, (2009a). ProUCL Version 4.00.04 Technical Guide (Draft). United States Environmental Protection Agency, Washington, DC, February 2009. EPA/600/R-07/041.

USEPA, (2009b). ProUCL Version 4.00.04 User Guide (Draft). United States Environmental Protection Agency, Washington, DC, February 2009. EPA/600/R-07/038.



Notes:
ND = Non-detect
DL = Detection Limit

figure 1
UCL METHODS DECISION FLOWCHART

TABLE 1

COEFFICIENTS a_i FOR THE SHAPIRO-WILK W-TEST OF NORMALITY

Order Statistic (i)	*Number of Samples (n)*																
	2	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*
1	0.7071	0.7071	0.6872	0.6646	0.6431	0.6233	0.6052	0.5888	0.5739	0.5601	0.5475	0.5359	0.5251	0.5150	0.5056	0.4968	0.4886
2	---	0.0000	0.1677	0.2413	0.2806	0.3031	0.3164	0.3244	0.3291	0.3315	0.3325	0.3325	0.3318	0.3306	0.3290	0.3273	0.3253
3	---	---	---	0.0000	0.0875	0.1401	0.1743	0.1976	0.2141	0.2260	0.2347	0.2412	0.2460	0.2495	0.2521	0.2540	0.2553
4	---	---	---	---	---	0.0000	0.0561	0.0947	0.1224	0.1429	0.1586	0.1707	0.1802	0.1878	0.1939	0.1988	0.2027
5	---	---	---	---	---	---	---	0.0000	0.0399	0.0695	0.0922	0.1099	0.1240	0.1353	0.1447	0.1524	0.1587
6	---	---	---	---	---	---	---	---	---	0.0000	0.0303	0.0539	0.0727	0.0880	0.1005	0.1109	0.1197
7	---	---	---	---	---	---	---	---	---	---	---	0.0000	0.0240	0.0433	0.0593	0.0725	0.0837
8	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0000	0.0196	0.0359	0.0496
9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0000	0.0163
10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 1

COEFFICIENTS a_i FOR THE SHAPIRO-WILK W-TEST OF NORMALITY

Order Statistic (i)	*Number of Samples (n)*															
	19	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**
1	0.4808	0.4734	0.4643	0.4590	0.4542	0.4493	0.4450	0.4407	0.4366	0.4328	0.4291	0.4254	0.4220	0.4188	0.4156	0.4127
2	0.3232	0.3211	0.3185	0.3156	0.3126	0.3098	0.3069	0.3043	0.3018	0.2992	0.2968	0.2944	0.2921	0.2898	0.2876	0.2854
3	0.2561	0.2565	0.2578	0.2571	0.2563	0.2554	0.2543	0.2533	0.2522	0.2510	0.2499	0.2487	0.2475	0.2463	0.2451	0.2439
4	0.2059	0.2085	0.2119	0.2131	0.2139	0.2145	0.2148	0.2151	0.2152	0.2151	0.2150	0.2148	0.2145	0.2141	0.2137	0.2132
5	0.1641	0.1686	0.1736	0.1764	0.1787	0.1807	0.1822	0.1836	0.1848	0.1857	0.1864	0.1870	0.1874	0.1878	0.1880	0.1882
6	0.1271	0.1334	0.1399	0.1443	0.1480	0.1512	0.1539	0.1563	0.1584	0.1601	0.1616	0.1630	0.1641	0.1651	0.1660	0.1667
7	0.0932	0.1013	0.1092	0.1150	0.1201	0.1245	0.1283	0.1316	0.1346	0.1372	0.1395	0.1415	0.1433	0.1449	0.1463	0.1475
8	0.0612	0.0711	0.0804	0.0878	0.0941	0.0997	0.1046	0.1089	0.1128	0.1162	0.1192	0.1219	0.1243	0.1265	0.1284	0.1301
9	0.0303	0.0422	0.0530	0.0618	0.0696	0.0764	0.0823	0.0876	0.0923	0.0965	0.1002	0.1036	0.1066	0.1093	0.1118	0.1140
10	0.0000	0.0140	0.0263	0.0368	0.0459	0.0539	0.0610	0.0672	0.0728	0.0778	0.0822	0.0862	0.0899	0.0931	0.0961	0.0988
11	---	---	0.0000	0.0122	0.0228	0.0321	0.0403	0.0476	0.0540	0.0598	0.0650	0.0697	0.0739	0.0777	0.0812	0.0844
12	---	---	---	---	0.0000	0.0107	0.0200	0.0284	0.0358	0.0424	0.0483	0.0537	0.0585	0.0629	0.0669	0.0706
13	---	---	---	---	---	---	0.0000	0.0094	0.0178	0.0253	0.0320	0.0381	0.0435	0.0485	0.0530	0.0572
14	---	---	---	---	---	---	---	---	0.0000	0.0084	0.0159	0.0227	0.0289	0.0344	0.0395	0.0441
15	---	---	---	---	---	---	---	---	---	---	0.0000	0.0076	0.0144	0.0206	0.0262	0.0314
16	---	---	---	---	---	---	---	---	---	---	---	---	0.0000	0.0068	0.0131	0.0187
17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0000	0.0062
18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 1

COEFFICIENTS a_i FOR THE SHAPIRO-WILK W-TEST OF NORMALITY

Order Statistic (i)	*Number of Samples (n)*															
	35	*36*	*37*	*38*	*39*	*40*	*41*	*42*	*43*	*44*	*45*	*46*	*47*	*48*	*49*	*50*
1	0.4096	0.4068	0.4040	0.4015	0.3989	0.3964	0.3940	0.3917	0.3894	0.3872	0.3850	0.3830	0.3808	0.3789	0.3770	0.3751
2	0.2834	0.2813	0.2794	0.2774	0.2755	0.2737	0.2719	0.2701	0.2684	0.2667	0.2651	0.2635	0.2620	0.2604	0.2589	0.2574
3	0.2427	0.2415	0.2403	0.2391	0.2380	0.2368	0.2357	0.2345	0.2334	0.2323	0.2313	0.2302	0.2291	0.2281	0.2271	0.2260
4	0.2127	0.2121	0.2116	0.2110	0.2104	0.2098	0.2091	0.2085	0.2078	0.2072	0.2065	0.2058	0.2052	0.2045	0.2038	0.2032
5	0.1883	0.1883	0.1883	0.1881	0.1880	0.1878	0.1876	0.1874	0.1871	0.1868	0.1865	0.1862	0.1859	0.1855	0.1851	0.1847
6	0.1673	0.1678	0.1683	0.1686	0.1689	0.1691	0.1693	0.1694	0.1695	0.1695	0.1695	0.1695	0.1695	0.1693	0.1692	0.1691
7	0.1487	0.1496	0.1505	0.1513	0.1520	0.1526	0.1531	0.1535	0.1539	0.1542	0.1545	0.1548	0.1550	0.1551	0.1553	0.1554
8	0.1317	0.1331	0.1344	0.1356	0.1366	0.1376	0.1384	0.1392	0.1398	0.1405	0.1410	0.1415	0.1420	0.1423	0.1427	0.1430
9	0.1160	0.1179	0.1196	0.1211	0.1225	0.1237	0.1249	0.1259	0.1269	0.1278	0.1286	0.1293	0.1300	0.1306	0.1312	0.1317
10	0.1013	0.1036	0.1056	0.1075	0.1092	0.1108	0.1123	0.1136	0.1149	0.1160	0.1170	0.1180	0.1189	0.1197	0.1205	0.1212
11	0.0873	0.0900	0.0924	0.0947	0.0967	0.0986	0.1004	0.1020	0.1035	0.1049	0.1062	0.1073	0.1085	0.1095	0.1105	0.1113
12	0.0739	0.0770	0.0798	0.0824	0.0848	0.0870	0.0891	0.0909	0.0927	0.0943	0.0959	0.0972	0.0986	0.0998	0.1010	0.1020
13	0.0610	0.0645	0.0677	0.0706	0.0733	0.0759	0.0782	0.0804	0.0824	0.0842	0.0860	0.0876	0.0892	0.0906	0.0919	0.0932
14	0.0484	0.0523	0.0559	0.0592	0.0622	0.0651	0.0677	0.0701	0.0724	0.0745	0.0765	0.0783	0.0801	0.0817	0.0832	0.0846
15	0.0361	0.0404	0.0444	0.0481	0.0515	0.0546	0.0575	0.0602	0.0628	0.0651	0.0673	0.0694	0.0713	0.0731	0.0748	0.0764
16	0.0239	0.0287	0.0331	0.0372	0.0409	0.0444	0.0476	0.0506	0.0534	0.0560	0.0584	0.0607	0.0628	0.0648	0.0667	0.0685
17	0.0119	0.0172	0.0220	0.0264	0.0305	0.0343	0.0379	0.0411	0.0442	0.0471	0.0497	0.0522	0.0546	0.0568	0.0588	0.0608
18	0.0000	0.0057	0.0110	0.0158	0.0203	0.0244	0.0283	0.0318	0.0352	0.0383	0.0412	0.0439	0.0465	0.0489	0.0511	0.0532
19	—	—	0.0000	0.0053	0.0101	0.0146	0.0188	0.0227	0.0263	0.0296	0.0328	0.0357	0.0385	0.0411	0.0436	0.0459
20	—	—	—	—	0.0000	0.0049	0.0094	0.0136	0.0175	0.0211	0.0245	0.0277	0.0307	0.0335	0.0361	0.0386
21	—	—	—	—	—	—	0.0000	0.0045	0.0087	0.0126	0.0163	0.0197	0.0229	0.0259	0.0288	0.0314
22	—	—	—	—	—	—	—	—	0.0000	0.0042	0.0081	0.0118	0.0153	0.0185	0.0215	0.0244
23	—	—	—	—	—	—	—	—	—	—	0.0000	0.0039	0.0076	0.0111	0.0143	0.0174
24	—	—	—	—	—	—	—	—	—	—	—	—	0.0000	0.0037	0.0071	0.0104
25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.0000	0.0035

TABLE 2

CRITICAL VALUES (W_{crit}) FOR THE SHAPIRO-WILK W-TEST OF NORMALITY

Number of Samples	*Selected Level of Significance (a)*								
	0.01	***0.02***	***0.05***	***0.10***	***0.50***	***0.90***	***0.95***	***0.98***	***0.99***
3	0.753	0.756	0.767	0.789	0.959	0.998	0.999	1.000	1.000
4	0.687	0.707	0.748	0.792	0.935	0.987	0.992	0.996	0.997
5	0.686	0.715	0.762	0.806	0.927	0.979	0.986	0.991	0.993
6	0.713	0.743	0.788	0.826	0.927	0.974	0.981	0.986	0.989
7	0.730	0.760	0.803	0.838	0.928	0.972	0.979	0.985	0.988
8	0.749	0.778	0.818	0.851	0.932	0.972	0.978	0.984	0.987
9	0.764	0.791	0.829	0.859	0.935	0.972	0.978	0.984	0.986
10	0.781	0.806	0.842	0.869	0.938	0.972	0.978	0.983	0.986
11	0.792	0.817	0.850	0.876	0.940	0.973	0.979	0.984	0.986
12	0.805	0.828	0.859	0.883	0.943	0.973	0.979	0.984	0.986
13	0.814	0.837	0.866	0.889	0.945	0.974	0.979	0.984	0.986
14	0.825	0.846	0.874	0.895	0.947	0.975	0.980	0.984	0.986
15	0.835	0.855	0.881	0.901	0.950	0.975	0.980	0.984	0.987
16	0.844	0.863	0.887	0.906	0.952	0.976	0.981	0.985	0.987
17	0.851	0.869	0.892	0.910	0.954	0.977	0.981	0.985	0.987
18	0.858	0.874	0.897	0.914	0.956	0.978	0.982	0.986	0.988
19	0.863	0.879	0.901	0.917	0.957	0.978	0.982	0.986	0.988
20	0.868	0.884	0.905	0.920	0.959	0.979	0.983	0.986	0.988
21	0.873	0.888	0.908	0.923	0.960	0.980	0.983	0.987	0.988
22	0.878	0.892	0.911	0.926	0.961	0.980	0.984	0.987	0.989
23	0.881	0.895	0.914	0.928	0.962	0.981	0.984	0.987	0.989
24	0.884	0.898	0.916	0.930	0.963	0.981	0.985	0.987	0.989
25	0.888	0.901	0.918	0.931	0.964	0.981	0.985	0.988	0.989
26	0.891	0.904	0.920	0.933	0.965	0.982	0.985	0.988	0.989
27	0.894	0.906	0.923	0.935	0.965	0.982	0.985	0.988	0.990
28	0.896	0.908	0.924	0.936	0.966	0.982	0.985	0.988	0.990
29	0.898	0.910	0.926	0.937	0.966	0.982	0.985	0.988	0.990
30	0.900	0.912	0.927	0.939	0.967	0.983	0.985	0.988	0.990
31	0.902	0.914	0.929	0.940	0.967	0.983	0.986	0.988	0.990
32	0.904	0.915	0.930	0.941	0.968	0.983	0.986	0.988	0.990
33	0.906	0.917	0.931	0.942	0.968	0.983	0.986	0.989	0.990
34	0.908	0.919	0.933	0.943	0.969	0.983	0.986	0.989	0.990
35	0.910	0.920	0.934	0.944	0.969	0.984	0.986	0.989	0.990
36	0.912	0.922	0.935	0.945	0.970	0.984	0.986	0.989	0.990
37	0.914	0.924	0.936	0.946	0.970	0.984	0.987	0.989	0.990
38	0.916	0.925	0.938	0.947	0.971	0.984	0.987	0.989	0.990
39	0.917	0.927	0.939	0.948	0.971	0.984	0.987	0.989	0.991
40	0.919	0.928	0.940	0.949	0.972	0.985	0.987	0.989	0.991
42	0.922	0.930	0.942	0.951	0.972	0.985	0.987	0.989	0.991
44	0.924	0.933	0.944	0.952	0.973	0.985	0.987	0.990	0.991
46	0.927	0.935	0.945	0.953	0.974	0.985	0.988	0.990	0.991
48	0.929	0.937	0.947	0.954	0.974	0.985	0.988	0.990	0.991
50	0.930	0.938	0.947	0.955	0.974	0.985	0.988	0.990	0.991

TABLE 3

CRITICAL VALUES (D_{crit}) FOR THE KOLMOGOROV SMIRNOV TEST OF GAMMA DISTRIBUTION ($\alpha = 0.05$)

	k (gamma parameter)								
n	***0.01***	***0.025***	***0.05***	***0.1***	***0.2***	***0.3***	***0.5***	***0.75***	***1***
4	0.4371	0.4323	0.4289	0.4296	0.4244	0.4181	0.4103	0.4050	0.4024
5	0.4191	0.4093	0.4009	0.3982	0.3885	0.3799	0.3716	0.3667	0.3644
6	0.3971	0.3844	0.3726	0.3688	0.3637	0.3568	0.3486	0.3434	0.3408
7	0.3849	0.3688	0.3528	0.3478	0.3419	0.3351	0.3272	0.3227	0.3196
8	0.3724	0.3541	0.3356	0.3287	0.3233	0.3170	0.3090	0.3041	0.3015
9	0.3617	0.3418	0.3208	0.3123	0.3075	0.3015	0.2941	0.2893	0.2869
10	0.3523	0.3314	0.3081	0.2984	0.2941	0.2878	0.2808	0.2760	0.2737
11	0.3440	0.3221	0.2976	0.2862	0.2819	0.2759	0.2691	0.2649	0.2624
12	0.3368	0.3137	0.2873	0.2753	0.2710	0.2653	0.2587	0.2548	0.2524
13	0.3297	0.3064	0.2789	0.2659	0.2613	0.2563	0.2498	0.2459	0.2430
14	0.3234	0.2996	0.2711	0.2568	0.2530	0.2478	0.2416	0.2376	0.2351
15	0.3178	0.2934	0.2638	0.2489	0.2451	0.2400	0.2338	0.2302	0.2279
16	0.3127	0.2878	0.2577	0.2419	0.2376	0.2329	0.2272	0.2232	0.2212
17	0.3078	0.2826	0.2519	0.2352	0.2315	0.2268	0.2209	0.2173	0.2151
18	0.3033	0.2776	0.2464	0.2292	0.2253	0.2208	0.2151	0.2114	0.2094
19	0.2990	0.2731	0.2415	0.2236	0.2198	0.2151	0.2100	0.2061	0.2043
20	0.2949	0.2691	0.2366	0.2185	0.2145	0.2101	0.2049	0.2014	0.1994
21	0.2915	0.2649	0.2323	0.2132	0.2097	0.2054	0.2004	0.1969	0.1949
22	0.2879	0.2612	0.2283	0.2090	0.2055	0.2011	0.1959	0.1927	0.1908
23	0.2847	0.2580	0.2247	0.2046	0.2013	0.1969	0.1919	0.1886	0.1867
24	0.2813	0.2546	0.2211	0.2007	0.1971	0.1932	0.1881	0.1849	0.1830
25	0.2786	0.2516	0.2179	0.1969	0.1933	0.1895	0.1845	0.1813	0.1796
26	0.2759	0.2486	0.2146	0.1933	0.1896	0.1858	0.1812	0.1780	0.1764
27	0.2732	0.2459	0.2118	0.1899	0.1863	0.1827	0.1779	0.1750	0.1730
28	0.2709	0.2434	0.2088	0.1867	0.1832	0.1795	0.1749	0.1719	0.1702
29	0.2683	0.2409	0.2062	0.1837	0.1802	0.1767	0.1721	0.1690	0.1675
30	0.2663	0.2386	0.2037	0.1809	0.1772	0.1736	0.1692	0.1663	0.1648
35	0.2561	0.2281	0.1927	0.1683	0.1647	0.1613	0.1571	0.1545	0.1530
40	0.2482	0.2196	0.1835	0.1581	0.1544	0.1514	0.1476	0.1449	0.1437
45	0.2412	0.2124	0.1759	0.1496	0.1461	0.1432	0.1393	0.1370	0.1356
50	0.2353	0.2063	0.1695	0.1425	0.1389	0.1361	0.1324	0.1304	0.1289
60	0.2258	0.1963	0.1592	0.1308	0.1272	0.1245	0.1214	0.1192	0.1180
70	0.2183	0.1886	0.1513	0.1216	0.1179	0.1157	0.1126	0.1107	0.1095
80	0.2122	0.1823	0.1447	0.1143	0.1105	0.1083	0.1055	0.1037	0.1027
90	0.2071	0.1771	0.1392	0.1082	0.1044	0.1023	0.0996	0.0979	0.0970
100	0.2029	0.1727	0.1347	0.1031	0.0991	0.0971	0.0946	0.0929	0.0921
200	0.1794	0.1487	0.1096	0.0753	0.0705	0.0691	0.0673	0.0662	0.0655
300	0.1691	0.1380	0.0985	0.0631	0.0577	0.0566	0.0551	0.0542	0.0537
400	0.1629	0.1316	0.0919	0.0559	0.0501	0.0491	0.0478	0.0470	0.0465
500	0.1587	0.1274	0.0874	0.0510	0.0448	0.0439	0.0428	0.0421	0.0417
1000	0.1484	0.1168	0.0764	0.0390	0.0318	0.0311	0.0303	0.0298	0.0295
2500	0.1394	0.1076	0.0668	0.0286	0.0202	0.0197	0.0192	0.0189	0.0187

Source: ProUCL Version 4.00.04 Technical Guide (February 2009)

TABLE 3

CRITICAL VALUES (D_{crit}) FOR THE KOLMOGOROV SMIRNOV TEST OF GAMMA DISTRIBUTION ($\alpha = 0.05$)

	k (gamma parameter)								
n	***1.5***	***2***	***3***	***4***	***5***	***10***	***20***	***50***	***100***
4	0.3995	0.3979	0.3966	0.3962	0.3959	0.3949	0.3942	0.3938	0.3940
5	0.3617	0.3605	0.3594	0.3584	0.3583	0.3576	0.3572	0.3569	0.3568
6	0.3375	0.3358	0.3346	0.3335	0.3328	0.3325	0.3317	0.3318	0.3315
7	0.3170	0.3151	0.3137	0.3129	0.3130	0.3119	0.3115	0.3114	0.3113
8	0.2989	0.2975	0.2963	0.2953	0.2952	0.2943	0.2939	0.2934	0.2936
9	0.2840	0.2825	0.2813	0.2804	0.2798	0.2793	0.2788	0.2787	0.2788
10	0.2711	0.2698	0.2685	0.2678	0.2674	0.2666	0.2662	0.2659	0.2658
11	0.2597	0.2585	0.2570	0.2565	0.2560	0.2554	0.2550	0.2546	0.2544
12	0.2495	0.2485	0.2474	0.2464	0.2459	0.2454	0.2452	0.2450	0.2450
13	0.2409	0.2394	0.2382	0.2377	0.2374	0.2367	0.2361	0.2362	0.2360
14	0.2327	0.2316	0.2305	0.2298	0.2293	0.2287	0.2283	0.2280	0.2279
15	0.2255	0.2244	0.2233	0.2226	0.2221	0.2215	0.2212	0.2210	0.2209
16	0.2189	0.2179	0.2167	0.2161	0.2158	0.2152	0.2146	0.2144	0.2144
17	0.2129	0.2117	0.2106	0.2100	0.2097	0.2089	0.2087	0.2085	0.2084
18	0.2072	0.2063	0.2050	0.2046	0.2041	0.2034	0.2033	0.2031	0.2031
19	0.2021	0.2008	0.2000	0.1992	0.1990	0.1986	0.1981	0.1981	0.1979
20	0.1974	0.1961	0.1950	0.1946	0.1945	0.1938	0.1935	0.1934	0.1934
21	0.1928	0.1918	0.1909	0.1903	0.1900	0.1894	0.1892	0.1889	0.1889
22	0.1885	0.1879	0.1867	0.1862	0.1859	0.1853	0.1849	0.1851	0.1848
23	0.1849	0.1838	0.1827	0.1824	0.1821	0.1815	0.1810	0.1809	0.1809
24	0.1812	0.1802	0.1792	0.1787	0.1783	0.1777	0.1775	0.1774	0.1772
25	0.1777	0.1767	0.1759	0.1753	0.1749	0.1745	0.1742	0.1739	0.1739
26	0.1742	0.1734	0.1724	0.1719	0.1716	0.1712	0.1708	0.1707	0.1707
27	0.1714	0.1705	0.1694	0.1689	0.1686	0.1681	0.1678	0.1676	0.1677
28	0.1684	0.1676	0.1666	0.1661	0.1659	0.1652	0.1652	0.1649	0.1648
29	0.1655	0.1647	0.1639	0.1634	0.1630	0.1625	0.1623	0.1622	0.1620
30	0.1629	0.1621	0.1611	0.1607	0.1603	0.1600	0.1597	0.1595	0.1596
35	0.1515	0.1507	0.1497	0.1494	0.1490	0.1486	0.1484	0.1482	0.1481
40	0.1420	0.1412	0.1404	0.1401	0.1399	0.1394	0.1391	0.1390	0.1390
45	0.1342	0.1334	0.1327	0.1323	0.1322	0.1317	0.1315	0.1314	0.1313
50	0.1275	0.1269	0.1262	0.1257	0.1256	0.1252	0.1249	0.1249	0.1249
60	0.1168	0.1161	0.1156	0.1151	0.1150	0.1147	0.1144	0.1143	0.1143
70	0.1084	0.1078	0.1071	0.1069	0.1067	0.1064	0.1061	0.1061	0.1061
80	0.1016	0.1011	0.1005	0.1002	0.0999	0.0997	0.0995	0.0993	0.0994
90	0.0959	0.0954	0.0949	0.0945	0.0944	0.0941	0.0939	0.0939	0.0938
100	0.0911	0.0906	0.0901	0.0898	0.0896	0.0894	0.0892	0.0892	0.0892
200	0.0648	0.0645	0.0641	0.0639	0.0638	0.0635	0.0635	0.0635	0.0634
300	0.0531	0.0528	0.0524	0.0523	0.0522	0.0521	0.0520	0.0519	0.0520
400	0.0460	0.0457	0.0455	0.0454	0.0453	0.0452	0.0451	0.0451	0.0451
500	0.0412	0.0410	0.0408	0.0406	0.0406	0.0404	0.0404	0.0403	0.0404
1000	0.0292	0.0291	0.0289	0.0288	0.0288	0.0286	0.0286	0.0286	0.0286
2500	0.0185	0.0184	0.0183	0.0183	0.0182	0.0182	0.0181	0.0181	0.0181

Source: ProUCL Version 4.00.04 Technical Guide (February 2009)

TABLE 4

CRITICAL VALUES (A^2_{crit}) FOR THE ANDERSON-DARLING TEST OF GAMMA DISTRIBUTION ($\alpha = 0.05$)

	k (gamma parameter)								
n	***0.01***	***0.025***	***0.05***	***0.1***	***0.2***	***0.3***	***0.5***	***0.75***	***1***
4	0.7933	0.7883	0.7863	0.7785	0.7325	0.7041	0.6809	0.6703	0.6666
5	0.8730	0.8462	0.8304	0.8264	0.7753	0.7392	0.7110	0.6983	0.6913
6	0.9490	0.8965	0.8535	0.8446	0.8025	0.7667	0.7359	0.7210	0.7151
7	1.0305	0.9476	0.8762	0.8598	0.8211	0.7841	0.7515	0.7361	0.7275
8	1.1136	1.0006	0.8986	0.8720	0.8359	0.7973	0.7624	0.7451	0.7355
9	1.1971	1.0535	0.9227	0.8810	0.8451	0.8073	0.7707	0.7515	0.7435
10	1.2792	1.1063	0.9420	0.8881	0.8539	0.8136	0.7770	0.7570	0.7483
11	1.3623	1.1586	0.9637	0.8950	0.8601	0.8201	0.7811	0.7625	0.7516
12	1.4414	1.2089	0.9834	0.8989	0.8656	0.8239	0.7849	0.7656	0.7567
13	1.5200	1.2605	1.0039	0.9049	0.8682	0.8298	0.7900	0.7703	0.7574
14	1.5958	1.3106	1.0234	0.9072	0.8735	0.8320	0.7933	0.7706	0.7600
15	1.6732	1.3605	1.0405	0.9113	0.8768	0.8355	0.7930	0.7751	0.7630
16	1.7482	1.4088	1.0618	0.9164	0.8783	0.8378	0.7963	0.7745	0.7633
17	1.8194	1.4552	1.0796	0.9205	0.8827	0.8418	0.7979	0.7764	0.7660
18	1.8905	1.4995	1.0965	0.9229	0.8842	0.8421	0.8001	0.7780	0.7666
19	1.9614	1.5452	1.1162	0.9250	0.8877	0.8428	0.8028	0.7788	0.7692
20	2.0284	1.5917	1.1322	0.9289	0.8880	0.8447	0.8025	0.7795	0.7679
21	2.0984	1.6336	1.1480	0.9288	0.8903	0.8458	0.8053	0.7828	0.7696
22	2.1639	1.6751	1.1669	0.9334	0.8918	0.8476	0.8043	0.7830	0.7708
23	2.2329	1.7214	1.1839	0.9338	0.8939	0.8488	0.8051	0.7822	0.7693
24	2.2974	1.7630	1.2009	0.9377	0.8938	0.8512	0.8063	0.7825	0.7719
25	2.3601	1.8028	1.2161	0.9394	0.8955	0.8518	0.8069	0.7835	0.7731
26	2.4252	1.8483	1.2315	0.9393	0.8936	0.8516	0.8085	0.7842	0.7734
27	2.4909	1.8820	1.2531	0.9437	0.8957	0.8531	0.8074	0.7839	0.7733
28	2.5562	1.9280	1.2634	0.9432	0.8971	0.8543	0.8103	0.7847	0.7738
29	2.6160	1.9685	1.2809	0.9478	0.8976	0.8562	0.8115	0.7837	0.7742
30	2.6778	2.0063	1.2983	0.9482	0.8976	0.8538	0.8092	0.7878	0.7755
35	2.9819	2.1959	1.3736	0.9546	0.8995	0.8565	0.8122	0.7877	0.7757
40	3.2742	2.3805	1.4435	0.9625	0.9028	0.8577	0.8131	0.7891	0.7787
45	3.5595	2.5587	1.5106	0.9690	0.9054	0.8619	0.8134	0.7897	0.7769
50	3.8334	2.7329	1.5791	0.9737	0.9074	0.8624	0.8143	0.7934	0.7800
60	4.3789	3.0659	1.7118	0.9844	0.9099	0.8633	0.8160	0.7921	0.7791
70	4.9012	3.3923	1.8398	0.9917	0.9096	0.8657	0.8167	0.7926	0.7805
80	5.4154	3.7091	1.9620	1.0021	0.9104	0.8649	0.8189	0.7931	0.7820
90	5.9167	4.0188	2.0787	1.0111	0.9113	0.8679	0.8184	0.7936	0.7828
100	6.4255	4.3222	2.1954	1.0194	0.9123	0.8676	0.8184	0.7950	0.7830
200	11.1598	7.1943	3.2677	1.1031	0.9142	0.8692	0.8209	0.7962	0.7839
300	15.6877	9.9089	4.2544	1.1798	0.9166	0.8707	0.8217	0.7969	0.7840
400	20.0982	12.5299	5.1940	1.2564	0.9170	0.8713	0.8230	0.7977	0.7846
500	24.4270	15.1069	6.1097	1.3280	0.9178	0.8716	0.8223	0.7971	0.7851
1000	45.5811	27.5755	10.4679	1.6707	0.9188	0.8707	0.8244	0.7966	0.7846
2500	107.0180	63.4597	22.7439	2.5739	0.9200	0.8732	0.8223	0.7969	0.7860

Source: ProUCL Version 4.00.04 Technical Guide (February 2009)

TABLE 4

CRITICAL VALUES (A^2_{crit}) FOR THE ANDERSON-DARLING TEST OF GAMMA DISTRIBUTION ($\alpha = 0.05$)

	k (gamma parameter)								
n	***1.5***	***2***	***3***	***4***	***5***	***10***	***20***	***50***	***100***
4	0.6624	0.6605	0.6594	0.6589	0.6590	0.6571	0.6571	0.6559	0.6565
5	0.6864	0.6845	0.6826	0.6812	0.6807	0.6789	0.6787	0.6783	0.6781
6	0.7078	0.7042	0.7013	0.7000	0.6980	0.6983	0.6971	0.6969	0.6962
7	0.7212	0.7149	0.7122	0.7097	0.7099	0.7085	0.7067	0.7077	0.7077
8	0.7284	0.7240	0.7215	0.7186	0.7191	0.7150	0.7162	0.7148	0.7147
9	0.7344	0.7298	0.7268	0.7250	0.7228	0.7218	0.7210	0.7205	0.7200
10	0.7392	0.7356	0.7322	0.7294	0.7295	0.7251	0.7246	0.7244	0.7238
11	0.7422	0.7389	0.7335	0.7326	0.7314	0.7294	0.7287	0.7284	0.7257
12	0.7455	0.7415	0.7390	0.7358	0.7320	0.7303	0.7319	0.7296	0.7312
13	0.7503	0.7431	0.7392	0.7372	0.7359	0.7337	0.7333	0.7325	0.7323
14	0.7507	0.7459	0.7425	0.7401	0.7380	0.7345	0.7340	0.7330	0.7334
15	0.7538	0.7468	0.7445	0.7400	0.7386	0.7374	0.7347	0.7345	0.7341
16	0.7547	0.7503	0.7443	0.7419	0.7413	0.7390	0.7365	0.7354	0.7360
17	0.7557	0.7494	0.7454	0.7428	0.7416	0.7388	0.7378	0.7367	0.7362
18	0.7562	0.7526	0.7458	0.7426	0.7430	0.7392	0.7395	0.7383	0.7372
19	0.7569	0.7518	0.7481	0.7451	0.7424	0.7412	0.7403	0.7404	0.7379
20	0.7578	0.7524	0.7475	0.7455	0.7452	0.7418	0.7407	0.7394	0.7405
21	0.7582	0.7538	0.7494	0.7473	0.7453	0.7426	0.7425	0.7412	0.7395
22	0.7587	0.7561	0.7494	0.7466	0.7464	0.7436	0.7403	0.7429	0.7406
23	0.7601	0.7547	0.7503	0.7491	0.7465	0.7441	0.7419	0.7414	0.7404
24	0.7615	0.7551	0.7511	0.7487	0.7462	0.7443	0.7423	0.7421	0.7418
25	0.7615	0.7565	0.7513	0.7487	0.7470	0.7448	0.7432	0.7423	0.7418
26	0.7616	0.7573	0.7505	0.7478	0.7463	0.7441	0.7438	0.7428	0.7422
27	0.7630	0.7566	0.7517	0.7490	0.7474	0.7436	0.7440	0.7433	0.7439
28	0.7627	0.7580	0.7537	0.7497	0.7485	0.7453	0.7446	0.7431	0.7431
29	0.7627	0.7573	0.7527	0.7503	0.7475	0.7457	0.7442	0.7439	0.7423
30	0.7630	0.7585	0.7524	0.7495	0.7465	0.7455	0.7443	0.7441	0.7451
35	0.7666	0.7597	0.7537	0.7526	0.7497	0.7483	0.7467	0.7447	0.7459
40	0.7658	0.7590	0.7547	0.7525	0.7515	0.7480	0.7467	0.7458	0.7468
45	0.7679	0.7605	0.7556	0.7529	0.7532	0.7484	0.7482	0.7473	0.7471
50	0.7672	0.7629	0.7569	0.7535	0.7537	0.7496	0.7482	0.7476	0.7481
60	0.7689	0.7629	0.7580	0.7536	0.7533	0.7512	0.7489	0.7476	0.7484
70	0.7689	0.7634	0.7575	0.7557	0.7542	0.7507	0.7492	0.7486	0.7490
80	0.7703	0.7631	0.7589	0.7563	0.7545	0.7505	0.7508	0.7484	0.7488
90	0.7715	0.7651	0.7592	0.7554	0.7548	0.7521	0.7495	0.7513	0.7502
100	0.7698	0.7650	0.7585	0.7564	0.7543	0.7522	0.7495	0.7504	0.7500
200	0.7713	0.7664	0.7604	0.7564	0.7561	0.7512	0.7513	0.7503	0.7506
300	0.7720	0.7659	0.7594	0.7588	0.7568	0.7552	0.7509	0.7516	0.7523
400	0.7728	0.7660	0.7602	0.7586	0.7572	0.7542	0.7515	0.7523	0.7511
500	0.7721	0.7671	0.7615	0.7590	0.7563	0.7534	0.7522	0.7515	0.7530
1000	0.7713	0.7679	0.7603	0.7597	0.7573	0.7527	0.7519	0.7497	0.7520
2500	0.7722	0.7666	0.7603	0.7641	0.7572	0.7527	0.7513	0.7522	0.7525

Source: ProUCL Version 4.00.04 Technical Guide (February 2009)

TABLE 5a

INITIAL SCREENING FOR SMALL OR HIGHLY CENSORED DATA SETS, AND TREATMENT OF ELEVATED DETECTION LIMITS

I) Data Sets Containing No Detected Values (i.e., 100% ND)

In this case, no statistics are performed and the maximum reported detection limit is taken as the 95% UCL.

II) Data Sets Containing Fewer than Five Data Points (i.e., $n < 5$)

In this case, no statistics are performed and the maximum value (detect or reported detection limit) is taken as the 95% UCL.

III) All Other Data Sets (i.e., $n \geq 5$ and at least 1 detected value)

A) If all data are detects (i.e., no non-detects present in the data set), then
proceed to Table 5b for UCL method selection

B) If non-detects are present, first screen and pre-process elevated detection limit data (i.e., above most or all detected values)

(i) If $n \leq 10$,
no pre-processing occurs [continue to (C) below]

(ii) If $10 < n < 100$, and fewer than 25 percent of all observations are non-detects with elevated detection limits,
remove the data with elevated detection limits from further consideration [and continue to (C) below]

(iii) If $n \geq 100$, and fewer than 50 percent of all observations are non-detects with elevated detection limits,
remove the data with elevated detection limits from further consideration [and continue to (C) below]

(iv) Otherwise,
retain all data and continue to (C) below.

C) For highly-censored data sets (> 90% ND and/or containing only 1 detected value),
use the maximum value (detect or detection limit, ignoring any data eliminated in (A) above) as the 95% UCL

D) For censored data sets containing only 2 detected values,

(i) If all non-detects have a consistent (i.e., equal) detection limit), then
use the KM (t-test) 95% UCL

(ii) If non-detects have varying detection limits, then
use the KM (t-test) or KM (Percentile bootstrap) 95% UCL

E) For censored data sets containing only 3 detected values,
follow the methods presented in Table 5c for UCL method selection, *excluding gamma* distribution methods.

F) For all other cases (i.e., data sets with non-detects having four or more detected values),
proceed to Table 5c for UCL method selection

Notes:

UCL methods are consistent with the ProUCL Version 4.00.04 Technical Guide (USEPA 2009) and its precursor document (USEPA 2007), applying professional judgment where "policy decisions" are required to establish exposure point concentrations using small or highly-censored data sets.

% ND Percentage of non-detect (less than) results in a data set.

KM Kaplan-Meier (KM) estimation method used to determine the sample mean, its standard error, and the 95% UCL of the population mean for data sets containing non-detects.

TABLE 5b

STATISTICAL METHODS USED FOR DETERMINING 95 PERCENT UPPER CONFIDENCE LIMITS (UCLs) FOR DATA SETS WITHOUT NONDETECT OBSERVATIONS

I) Normal or Approximately Normal ($\hat{s}$< 0.5, k_3 < 0.2-0.3) Data Sets

Measure of Symmetry	*Sample Size*	*95 percent UCL Method*
Normal distribution	All $n \geq 5$	t-test UCL or Modified t-test UCL
$\hat{s} < 0.5$	All $n \geq 5$	t-test UCL or Modified t-test UCL
$k_3 < 0.2\text{-}0.3$	All $n \geq 5$	t-test UCL or Modified t-test UCL

II) Gamma Distributed Data Sets

Measure of Symmetry	*Sample Size*	*95 percent UCL Method*
$\kappa < 0.1$	$5 \leq n < 15$	Bootstrap-t or Hall's Bootstrap UCL (if stable)‡, otherwise Adjusted Gamma 95% UCL
	$n \geq 15$	Adjusted Gamma 95% UCL (if available), otherwise Approximate Gamma 95% UCL
$0.1 \leq \kappa < 0.5$	All $n \geq 5$	Adjusted Gamma 95% UCL
$0.5 \leq \kappa$	All $n \geq 5$	Approximate Gamma 95% UCL

III) Lognormally Distributed Data Sets

Measure of Symmetry	*Sample Size*	*95 percent UCL Method*
$\hat{s} < 0.5$	All $n \geq 5$	t-test, Modified t-test or Land's-H 95% UCL
$0.5 \leq \hat{s} < 1.0$	All $n \geq 5$	Land's-H UCL
$1.0 \leq \hat{s} < 1.5$	$5 \leq n < 25$	95% Chebyshev (Mean, Sd) UCL
	$n \geq 25$	Land's-H UCL
$1.5 \leq \hat{s} < 2.0$	$5 \leq n < 20$	99% Chebyshev (Mean, Sd) UCL
	$20 \leq n < 50$	95% Chebyshev (Mean, Sd) UCL
	$n \geq 50$	Land's-H UCL
$2.0 \leq \hat{s} < 2.5$	$5 \leq n < 20$	99% Chebyshev (Mean, Sd) UCL
	$20 \leq n < 50$	97.5% Chebyshev (Mean, Sd) UCL
	$50 \leq n < 70$	95% Chebyshev (Mean, Sd) UCL
	$n \geq 70$	Land's-H UCL
$2.5 \leq \hat{s} < 3.0$	$5 \leq n < 30$	99% Chebyshev (Mean, Sd) UCL
	$30 \leq n < 70$	97.5% Chebyshev (Mean, Sd) UCL
	$70 \leq n < 100$	95% Chebyshev (Mean, Sd) UCL
	$n \geq 100$	Land's-H UCL
$3.0 \leq \hat{s} \leq 3.5$	$5 \leq n < 15$	Hall's Bootstrap (if stable)*, otherwise 99% Chebyshev (Mean, Sd) UCL
	$15 \leq n < 50$	99% Chebyshev (Mean, Sd) UCL
	$50 \leq n < 100$	97.5% Chebyshev (Mean, Sd) UCL
	$100 \leq n < 150$	95% Chebyshev (Mean, Sd) UCL
	$n \geq 150$	Land's-H UCL
$\hat{s} > 3.5$	$5 \leq n < 100$	Hall's Bootstrap (if stable)*, otherwise 99% Chebyshev (Mean, Sd) UCL
	$n \geq 100$	99% Chebyshev (Mean, Sd) UCL

TABLE 5b

STATISTICAL METHODS USED FOR DETERMINING 95 PERCENT UPPER CONFIDENCE LIMITS (UCLs) FOR DATA SETS WITHOUT NONDETECT OBSERVATIONS

IV) Data Sets Requiring Non-Parametric (Distribution-Free) Methods

Measure of Symmetry	*Sample Size*	*95 percent UCL Method*
$\S \leq 0.5$	All $n \geq 5$	t- test UCL or Modified t-test 95% UCL
$0.5 < \S \leq 1.0$	All $n \geq 5$	95% Chebyshev (Mean, Sd) UCL
$1.0 < \S \leq 2.0$	$5 \leq n < 50$	99% Chebyshev (Mean, Sd) UCL
	$n \geq 50$	97.5% Chebyshev (Mean, Sd) UCL
$2.0 < \S \leq 3.0$	$5 \leq n < 10$	Hall's Bootstrap (if stable)*, otherwise 99% Chebyshev (Mean, Sd) UCL
	$n \geq 10$	99% Chebyshev (Mean, Sd) UCL
$3.0 < \S \leq 3.5$	$5 \leq n < 30$	Hall's Bootstrap (if stable)*, otherwise 99% Chebyshev (Mean, Sd) UCL
	$n \geq 30$	99% Chebyshev (Mean, Sd) UCL
$\S > 3.5$	$5 \leq n < 100$	Hall's Bootstrap (if stable)*, otherwise 99% Chebyshev (Mean, Sd) UCL
	$n \geq 100$	99% Chebyshev (Mean, Sd) UCL

Notes:

UCL methods selected are from ProUCL Version 4.00.04 Draft Technical Guide (USEPA 2009) and the precursor document (USEPA 2007).

§ Standard deviation of natural-log transformed data.

κ Gamma shape parameter.

k_3 Skewness of the original (untransformed) data.

‡ If Bootstrap-t and Hall's bootstrap yield inflated UCLs, then the adjusted gamma UCL may be used.

* If Hall's Bootstrap yields an unrealistically high UCL, then the Chebyshev UCL should be used.

In cases where two UCL methods are listed, the one producing the higher (more conservative) estimate has been retained for the purposes of exposure estimates

TABLE 5c

STATISTICAL METHODS USED FOR DETERMINING 95 PERCENT UPPER CONFIDENCE LIMITS (UCLs) FOR DATA SETS WITH NONDETECT OBSERVATIONS

I) Normal or Approximately Normal (ŝ< 0.5) Data Sets [1]

Measure of Symmetry [1]	*Percentage of Non-Detect Results*	*Sample Size*	*95 percent UCL Method*
Normal distribution	0 < %ND < 100	All $n \geq 5$	KM (t-test) or KM (Percentile Bootstrap) 95% UCL
ŝ < 0.5	0 < %ND < 100	All $n \geq 5$	KM (t-test) or KM (Percentile Bootstrap) 95% UCL

II) Gamma Distributed Data Sets [1]

Measure of Symmetry [1]	*Percentage of Non-Detect Results*	*Sample Size*	*95 percent UCL Method*
$\kappa \leq 1$	0 < %ND < 30	All $n \geq 5$	KM (Chebyshev) 95% UCL
	30 ≤ %ND < 50	All $n \geq 5$	KM (BCA Bootstrap) 95% UCL
	50 ≤ %ND < 100	All $n \geq 5$	KM (t-test) 95% UCL
$1 < \kappa \leq 2$	0 < %ND < 10	All $n \geq 5$	KM (Chebyshev) 95% UCL
	10 ≤ %ND < 25	All $n \geq 5$	KM (BCA Bootstrap) 95% UCL
	25 ≤ %ND < 40	All $n \geq 5$	KM (Percentile Bootstrap) 95% UCL
	40 ≤ %ND < 100	All $n \geq 5$	KM (t-test) 95% UCL
$\kappa > 2$	0 < %ND < 20	All $n \geq 5$	KM (BCA Bootstrap) 95% UCL
	20 ≤ %ND < 40	All $n \geq 5$	KM (Percentile Bootstrap) 95% UCL
	40 ≤ %ND < 100	All $n \geq 5$	KM (t-test) 95% UCL

III) Lognormally Distributed Data Sets [1]

Measure of Symmetry [1]	*Percentage of Non-Detect Results*	*Sample Size*	*95 percent UCL Method*
ŝ ≤ 1.0	0 < %ND ≤ 20	$5 \leq n \leq$ 50-70	KM (Chebyshev) 95% UCL
	0 < %ND ≤ 20	$n >$ 50-70	KM (BCA Bootstrap) 95% UCL
	20 < %ND < 40	All $n \geq 5$	KM (BCA Bootstrap) 95% UCL
	40 ≤ %ND < 100	All $n \geq 5$	KM (t-test) or KM (Percentile Bootstrap) 95% UCL
1.0 ≤ ŝ ≤ 1.5	0 < %ND ≤ 50	$5 \leq n <$ 40	KM (Chebyshev) 97.5% UCL
	0 < %ND ≤ 50	$n \geq 40$	KM (Chebyshev) 95% UCL
	50 < %ND < 100	All $n \geq 5$	KM (BCA Bootstrap) 95% UCL
1.5 < ŝ ≤ 2.0	0 < %ND < 50	$5 \leq n <$ 40	KM (Chebyshev) 99% UCL
	0 < %ND < 50	$n \geq 40$	KM (Chebyshev) 97.5% UCL
	50 ≤ %ND < 100	$5 \leq n \leq$ 40-50	KM (Chebyshev) 97.5% UCL
	50 ≤ %ND < 100	$n \geq$ 40-50	KM (Chebyshev) 95% UCL
ŝ > 2.0, 3.0	0 < %ND < 100	$5 \leq n \leq$ 50-60	KM (Chebyshev) 99% UCL
	0 < %ND < 100	$n \geq 60$	KM (Chebyshev) 97.5% UCL

TABLE 5c

STATISTICAL METHODS USED FOR DETERMINING 95 PERCENT UPPER CONFIDENCE LIMITS (UCLs) FOR DATA SETS WITH NONDETECT OBSERVATIONS

IV) Data Sets Requiring Non-Parametric (Distribution-Free) Methods [1]

Measure of Symmetry [1]	*Percentage of Non-Detect Results*	*Sample Size*	*95 percent UCL Method*
$\hat{s} < 0.5$	$0 < \%ND < 100$	All $n \geq 5$	KM (t-test) or KM (Percentile Bootstrap) 95% UCL
$0.5 \leq \hat{s} \leq 1.0$	$0 < \%ND \leq 20$	$5 \leq n \leq 50\text{-}70$	KM (Chebyshev) 95% UCL
	$0 < \%ND \leq 20$	$n > 50\text{-}70$	KM (BCA Bootstrap) 95% UCL
	$20 < \%ND < 40$	All $n \geq 5$	KM (BCA Bootstrap) 95% UCL
	$40 \leq \%ND < 100$	All $n \geq 5$	KM (t-test) or KM (Percentile Bootstrap) 95% UCL
$1.0 < \hat{s} \leq 1.5$	$0 < \%ND \leq 50$	$5 \leq n < 40$	KM (Chebyshev) 97.5% UCL
	$0 < \%ND \leq 50$	$n \geq 40$	KM (Chebyshev) 95% UCL
	$50 < \%ND < 100$	All $n \geq 5$	KM (BCA Bootstrap) 95% UCL
$1.5 < \hat{s} \leq 2.0$	$0 < \%ND < 50$	$5 \leq n < 40$	KM (Chebyshev) 99% UCL
	$0 < \%ND < 50$	$n \geq 40$	KM (Chebyshev) 97.5% UCL
	$50 \leq \%ND < 100$	$5 \leq n \leq 40\text{-}50$	KM (Chebyshev) 97.5% UCL
	$50 \leq \%ND < 100$	$n \geq 40\text{-}50$	KM (Chebyshev) 95% UCL
$\hat{s} > 2.0, 3.0$	$0 < \%ND < 100$	$5 \leq n < 50\text{-}60$	KM (Chebyshev) 99% UCL
	$0 < \%ND < 100$	$n \geq 60$	KM (Chebyshev) 97.5% UCL

Notes:

UCL methods selected are from Section 4.10 of ProUCL Version 4.00.04 Draft Technical Guide (USEPA 2009) and the precursor document (USEPA 2007).

$\hat{s}$ Standard deviation of natural-log transformed data based on detected values only.

κ Gamma shape parameter, based on detected values only.

% ND Percentage of non-detect (less than) results in a data set.

KM Kaplan-Meier (KM) estimation method used to determine the sample mean, its standard error, and the 95% UCL of the population mean for data sets containing non-detects.

(1) Data distribution and symmetry statistic estimates are based on detected values only.

In cases where two UCL methods are listed, the one producing the higher (more conservative) estimate has been retained for the purposes of exposure estimates

TABLE 6

VALUES OF THE CUMULATIVE CHI-SQUARE (X^2) DISTRIBUTION ($\alpha = 0.05$)

Degrees of Freedom	***Chi-square Value***	*Degrees of Freedom*	***Chi-square Value***	*Degrees of Freedom*	***Chi-square Value***	*Degrees of Freedom*	***Chi-square Value***
1	0.003932	**42**	28.14	**155**	127.2	**410**	364.1
2	0.1026	**44**	29.79	**160**	131.8	**420**	373.5
3	0.3518	**46**	31.44	**165**	136.3	**430**	382.9
4	0.7107	**48**	33.10	**170**	140.8	**440**	392.4
5	1.145	**50**	34.76	**175**	145.4	**450**	401.8
6	1.635	**52**	36.44	**180**	150.0	**460**	411.3
7	2.167	**54**	38.12	**185**	154.5	**470**	420.7
8	2.733	**56**	39.80	**190**	159.1	**480**	430.2
9	3.325	**58**	41.49	**195**	163.7	**490**	439.7
10	3.940	**60**	43.19	**200**	168.3	**500**	449.1
11	4.575	**62**	44.89	**205**	172.9	**510**	458.6
12	5.226	**64**	46.59	**210**	177.5	**520**	468.1
13	5.892	**66**	48.31	**215**	182.1	**530**	477.6
14	6.571	**68**	50.02	**220**	186.7	**540**	487.1
15	7.261	**70**	51.74	**225**	191.3	**550**	496.6
16	7.962	**72**	53.46	**230**	195.9	**560**	506.1
17	8.672	**74**	55.19	**235**	200.5	**570**	515.6
18	9.390	**76**	56.92	**240**	205.1	**580**	525.1
19	10.12	**78**	58.65	**245**	209.8	**590**	534.7
20	10.85	**80**	60.39	**250**	214.4	**600**	544.2
21	11.59	**82**	62.13	**255**	219.0	**620**	563.2
22	12.34	**84**	63.88	**260**	223.7	**640**	582.3
23	13.09	**86**	65.62	**265**	228.3	**660**	601.4
24	13.85	**88**	67.37	**270**	232.9	**680**	620.5
25	14.61	**90**	69.13	**275**	237.6	**700**	639.6
26	15.38	**92**	70.88	**280**	242.2	**720**	658.7
27	16.15	**94**	72.64	**285**	246.9	**740**	677.9
28	16.93	**96**	74.40	**290**	251.6	**760**	697.0
29	17.71	**98**	76.16	**295**	256.2	**780**	716.2
30	18.49	**100**	77.93	**300**	260.9	**800**	735.4
31	19.28	**105**	82.35	**310**	270.2	**820**	754.5
32	20.07	**110**	86.79	**320**	279.6	**840**	773.7
33	20.87	**115**	91.24	**330**	288.9	**860**	792.9
34	21.66	**120**	95.70	**340**	298.3	**880**	812.2
35	22.47	**125**	100.2	**350**	307.6	**900**	831.4
36	23.27	**130**	104.7	**360**	317.0	**920**	850.6
37	24.07	**135**	109.2	**370**	326.4	**940**	869.8
38	24.88	**140**	113.7	**380**	335.8	**960**	889.1
39	25.70	**145**	118.2	**390**	345.2	**980**	908.3
40	26.51	**150**	122.7	**400**	354.6	**1000**	927.6

Source: MS Excel GammaInv function (setting 'probability'= 0.05, 'alpha' = degrees of freedom ÷ 2, and 'beta' = 2)

TABLE 7

ADJUSTED SIGNIFICANCE LEVELS (α') FOR ADJUSTED GAMMA UCL CALCULATIONS

Number	*Specified level of significance (α)*		
of Samples	*0.05*	*0.1*	*0.01*
5	0.0086	0.0432	0.0000
10	0.0267	0.0724	0.0015
20	0.0380	0.0866	0.0046
40	0.0440	0.0934	0.0070
∞	0.0500	0.1000	0.0100

Source: Table 2-2 of ProUCL Version 4.00.04 Technical Guide (February 2009)

TABLE 8

VALUES OF $H_{0.95}$ FOR LAND'S-H UCL METHOD

Standard deviation of log-transformed data (S_{log})	*Number of Samples*												
	3	*5*	*7*	*10*	*12*	*15*	*21*	*31*	*51*	*101*	*301*	*601*	*1001*
0.10	2.750	2.035	1.886	1.802	1.775	1.749	1.722	1.701	1.684	1.670	1.659	1.656	1.654
0.20	3.295	2.198	1.992	1.881	1.843	1.809	1.771	1.742	1.718	1.697	1.680	1.674	1.671
0.30	4.109	2.402	2.125	1.977	1.927	1.882	1.833	1.793	1.761	1.733	1.709	1.700	1.696
0.40	5.220	2.651	2.282	2.089	2.026	1.968	1.905	1.856	1.813	1.777	1.746	1.734	1.728
0.50	6.495	2.947	2.465	2.220	2.141	2.068	1.989	1.928	1.876	1.830	1.790	1.776	1.769
0.60	7.807	3.287	2.673	2.368	2.271	2.181	2.085	2.010	1.946	1.891	1.843	1.825	1.816
0.70	9.120	3.662	2.904	2.532	2.414	2.306	2.191	2.102	2.025	1.960	1.902	1.881	1.870
0.80	10.43	4.062	3.155	2.710	2.570	2.443	2.307	2.202	2.112	2.035	1.968	1.944	1.931
0.90	11.74	4.478	3.420	2.902	2.738	2.589	2.432	2.310	2.206	2.117	2.040	2.012	1.997
1.00	13.05	4.905	3.695	3.103	2.915	2.744	2.564	2.423	2.306	2.205	2.117	2.085	2.068
1.25	16.33	6.001	4.426	3.639	3.389	3.163	2.923	2.737	2.580	2.447	2.330	2.288	2.266
1.50	19.60	7.120	5.184	4.207	3.896	3.612	3.311	3.077	2.881	2.713	2.566	2.514	2.486
1.75	22.87	8.250	5.960	4.795	4.422	4.081	3.719	3.437	3.200	2.997	2.820	2.757	2.723
2.00	26.14	9.387	6.747	5.396	4.962	4.564	4.141	3.812	3.533	3.295	3.088	3.013	2.974
2.50	32.69	11.67	8.339	6.621	6.067	5.557	5.013	4.588	4.228	3.920	3.650	3.553	3.503
3.00	39.23	13.97	9.945	7.864	7.191	6.570	5.907	5.388	4.947	4.569	4.238	4.119	4.057
3.50	45.77	16.27	11.56	9.118	8.326	7.596	6.815	6.201	5.681	5.233	4.842	4.700	4.627
4.00	52.31	18.58	13.18	10.38	9.469	8.630	7.731	7.024	6.424	5.908	5.456	5.293	5.208
4.50	58.85	20.88	14.80	11.64	10.62	9.669	8.652	7.854	7.174	6.590	6.077	5.892	5.796
5.00	65.39	23.19	16.43	12.91	11.77	10.71	9.579	8.688	7.929	7.277	6.704	6.497	6.390
6.00	78.47	27.81	19.68	15.45	14.08	12.81	11.44	10.36	9.449	8.661	7.968	7.718	7.588
7.00	91.55	32.43	22.94	18.00	16.39	14.90	13.31	12.05	10.98	10.05	9.242	8.949	8.797
8.00	104.6	37.06	26.20	20.55	18.71	17.01	15.18	13.74	12.51	11.45	10.52	10.19	10.01
9.00	117.7	41.68	29.46	23.10	21.03	19.11	17.05	15.43	14.05	12.85	11.81	11.43	11.23
10.00	130.8	46.31	32.73	25.66	23.35	21.22	18.93	17.13	15.59	14.26	13.10	12.67	12.45

Sources: Land (1975) and Gilbert (1987).

TABLE 9

Z-SCORES FOR THE STANDARD NORMAL DISTRIBUTION

(i) Probability associated with specified Z-score

Z-Score	*Probability*	*Z-Score*	*Probability*	*Z-Score*	*Probability*	*Z-Score*	*Probability*
-4.00	0.00003	-2.00	0.0228	0.00	0.5000	2.00	0.9772
-3.95	0.00004	-1.95	0.0228	0.05	0.5199	2.05	0.9798
-3.90	0.00005	-1.90	0.0287	0.10	0.5398	2.10	0.9821
-3.85	0.0001	-1.85	0.0322	0.15	0.5596	2.15	0.9842
-3.80	0.0001	-1.80	0.0359	0.20	0.5793	2.20	0.9861
-3.75	0.0001	-1.75	0.0401	0.25	0.5987	2.25	0.9878
-3.70	0.0001	-1.70	0.0446	0.30	0.6179	2.30	0.9893
-3.65	0.0001	-1.65	0.0495	0.35	0.6368	2.35	0.9906
-3.60	0.0002	-1.60	0.0548	0.40	0.6554	2.40	0.9918
-3.55	0.0002	-1.55	0.0606	0.45	0.6736	2.45	0.9929
-3.50	0.0002	-1.50	0.0668	0.50	0.6915	2.50	0.9938
-3.45	0.0003	-1.45	0.0735	0.55	0.7088	2.55	0.9946
-3.40	0.0003	-1.40	0.0808	0.60	0.7257	2.60	0.9953
-3.35	0.0004	-1.35	0.0885	0.65	0.7422	2.65	0.9960
-3.30	0.0005	-1.30	0.0968	0.70	0.7580	2.70	0.9965
-3.25	0.0006	-1.25	0.1056	0.75	0.7734	2.75	0.9970
-3.20	0.0007	-1.20	0.1151	0.80	0.7881	2.80	0.9974
-3.15	0.0008	-1.15	0.1251	0.85	0.8023	2.85	0.9978
-3.10	0.0010	-1.10	0.1357	0.90	0.8159	2.90	0.9981
-3.05	0.0011	-1.05	0.1469	0.95	0.8289	2.95	0.9984
-3.00	0.0013	-1.00	0.1587	1.00	0.8413	3.00	0.9987
-2.95	0.0016	-0.95	0.1711	1.05	0.8531	3.05	0.9989
-2.90	0.0019	-0.90	0.1841	1.10	0.8643	3.10	0.9990
-2.85	0.0022	-0.85	0.1977	1.15	0.8749	3.15	0.9992
-2.80	0.0026	-0.80	0.2119	1.20	0.8849	3.20	0.9993
-2.75	0.0030	-0.75	0.2266	1.25	0.8944	3.25	0.9994
-2.70	0.0035	-0.70	0.2420	1.30	0.9032	3.30	0.9995
-2.65	0.0040	-0.65	0.2578	1.35	0.9115	3.35	0.9996
-2.60	0.0047	-0.60	0.2743	1.40	0.9192	3.40	0.9997
-2.55	0.0054	-0.55	0.2912	1.45	0.9265	3.45	0.9997
-2.50	0.0062	-0.50	0.3085	1.50	0.9332	3.50	0.9998
-2.45	0.0071	-0.45	0.3264	1.55	0.9394	3.55	0.9998
-2.40	0.0082	-0.40	0.3446	1.60	0.9452	3.60	0.9998
-2.35	0.0094	-0.35	0.3632	1.65	0.9505	3.65	0.9999
-2.30	0.0107	-0.30	0.3821	1.70	0.9554	3.70	0.9999
-2.25	0.0122	-0.25	0.4013	1.75	0.9599	3.75	0.9999
-2.20	0.0139	-0.20	0.4207	1.80	0.9641	3.80	0.9999
-2.15	0.0158	-0.15	0.4404	1.85	0.9678	3.85	0.9999
-2.10	0.0179	-0.10	0.4602	1.90	0.9713	3.90	0.99995
-2.05	0.0202	-0.05	0.4801	1.95	0.9744	3.95	0.99996
-2.00	0.0228	0.00	0.5000	2.00	0.9772	4.00	0.99997

TABLE 9

Z-SCORES FOR THE STANDARD NORMAL DISTRIBUTION

(ii) Z-score associated with specified Probability

Probability	*Z-Score*	*Probability*	*Z-Score*	*Probability*	*Z-Score*	*Probability*	*Z-Score*
0.000001	-4.753	0.10	-1.282	0.50	0.000	0.90	1.282
0.000005	-4.417	0.11	-1.227	0.51	0.025	0.91	1.341
0.000007	-4.344	0.12	-1.175	0.52	0.050	0.92	1.405
0.000009	-4.288	0.13	-1.126	0.53	0.075	0.93	1.476
0.00001	-4.265	0.14	-1.080	0.54	0.100	0.94	1.555
0.00002	-4.107	0.15	-1.036	0.55	0.126	0.95	1.645
0.00003	-4.013	0.16	-0.994	0.56	0.151	0.96	1.751
0.00004	-3.944	0.17	-0.954	0.57	0.176	0.97	1.881
0.00005	-3.891	0.18	-0.915	0.58	0.202	0.98	2.054
0.00006	-3.846	0.19	-0.878	0.59	0.228	0.99	2.326
0.00007	-3.808	0.20	-0.842	0.60	0.253	0.991	2.366
0.00008	-3.775	0.21	-0.806	0.61	0.279	0.992	2.409
0.00009	-3.746	0.22	-0.772	0.62	0.305	0.993	2.457
0.0001	-3.719	0.23	-0.739	0.63	0.332	0.994	2.512
0.0002	-3.540	0.24	-0.706	0.64	0.358	0.995	2.576
0.0003	-3.432	0.25	-0.674	0.65	0.385	0.996	2.652
0.0004	-3.353	0.26	-0.643	0.66	0.412	0.997	2.748
0.0005	-3.291	0.27	-0.613	0.67	0.440	0.998	2.878
0.0006	-3.239	0.28	-0.583	0.68	0.468	0.999	3.090
0.0007	-3.195	0.29	-0.553	0.69	0.496	0.9991	3.121
0.0008	-3.156	0.30	-0.524	0.70	0.524	0.9992	3.156
0.0009	-3.121	0.31	-0.496	0.71	0.553	0.9993	3.195
0.001	-3.090	0.32	-0.468	0.72	0.583	0.9994	3.239
0.002	-2.878	0.33	-0.440	0.73	0.613	0.9995	3.291
0.003	-2.748	0.34	-0.412	0.74	0.643	0.9996	3.353
0.004	-2.652	0.35	-0.385	0.75	0.674	0.9997	3.432
0.005	-2.576	0.36	-0.358	0.76	0.706	0.9998	3.540
0.006	-2.512	0.37	-0.332	0.77	0.739	0.9999	3.719
0.007	-2.457	0.38	-0.305	0.78	0.772	0.99991	3.746
0.008	-2.409	0.39	-0.279	0.79	0.806	0.99992	3.775
0.009	-2.366	0.40	-0.253	0.80	0.842	0.99993	3.808
0.01	-2.326	0.41	-0.228	0.81	0.878	0.99994	3.846
0.02	-2.054	0.42	-0.202	0.82	0.915	0.99995	3.891
0.03	-1.881	0.43	-0.176	0.83	0.954	0.99996	3.944
0.04	-1.751	0.44	-0.151	0.84	0.994	0.99997	4.013
0.05	-1.645	0.45	-0.126	0.85	1.036	0.99998	4.107
0.06	-1.555	0.46	-0.100	0.86	1.080	0.99999	4.265
0.07	-1.476	0.47	-0.075	0.87	1.126	0.999991	4.288
0.08	-1.405	0.48	-0.050	0.88	1.175	0.999993	4.344
0.09	-1.341	0.49	-0.025	0.89	1.227	0.999995	4.417
0.10	-1.282	0.50	0.000	0.90	1.282	0.999999	4.753

APPENDIX E

LEAD MODELING

LIST OF TABLES

TABLE E.1 ADULT LEAD MODEL FOR CURRENT/FUTURE INDUSTRIAL/COMMERCIAL WORKER EXPOSED TO LEAD IN SURFACE SOIL AND FOR FUTURE CONSTRUCTION/UTILITY WORKER EXPOSED TO LEAD IN SOIL

TABLE E.2 IEUBK MODEL INPUT PARAMETERS FOR LEAD IN ON-SITE GROUNDWATER FOR THE PROTECTION OF THE OFF-SITE CHILD RESIDENT

LIST OF ATTACHMENTS

ATTACHMENT E.1 IEUBK MODEL OUTPUTS

TABLE E.1

ADULT LEAD MODEL FOR CURRENT/ FUTURE INDUSTRIAL/ COMMERCIAL WORKER EXPOSED TO LEAD IN SURFACE SOIL
AND FOR FUTURE CONSTRUCTION/ UTILITY WORKER EXPOSED TO LEAD IN SOIL
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

Model Parameters	*Symbol*	*Units*	*Current/ Future On-Site Industrial/ Commercial Worker*	*Future On-Site Construction/ Utility Worker*	*Ref*
Concentration of Lead in Soil	PbS	µg/g	990	1,105	Site-Specific (1)
95th Percentile PbB in fetus	$PbB_{fetal,0.95}$	µg/dL	10	10	(2)
R (Mean ratio of fetal to maternal PbB)	$R_{fetal/maternal}$	unitless	0.9	0.9	(2)
Individual geometric standard deviation	GSD_i	unitless	2.1	2.1	(2)
Baseline blood lead value	$PbB_{adult,0}$	µg/dL	1.9	1.9	(2)
Biokinetic slope factor	BKSF	µg/dL per µg/day	0.4	0.4	(2)
Soil ingestion rate	IR_S	g/day	0.1	0.33	(3)
Soil exposure frequency	EF_S	days/yr	219	60	Exposure Scenario Specific
Absolute absorption fraction of lead in soil	AF_S		0.12	0.12	(2)
Averaging time	AT	days/yr	307	84	(2)

EXPOSURE VALUE	Formula	PbB (µg/dL)	PbB (µg/dL)
Blood lead contribution from Soil	$PbB_{soil} = (PbS \times BKSF \times IR_S \times AF_S \times EF_S)/AT$	3.39E+00	1.25E+01
Total from site exposure	$PbB_{From\ Site\ Exposure} = PbB_{SOIL} + PbB_{WATER}$	3.39E+00	1.25E+01
Total from site exposure + non-site exposure	$PbB_{site+non\text{-}site} = PbB_{From\ Site\ Exposure} + PbB_{adult,0}$	5.29	14.40
95th percentile for fetal blood lead	$PbB_{fetal,0.95} = R_{fetal/maternal} \times GSD_i^{1.645} \times PbB_{site+non\text{-}site}$	16.1	43.9

Notes:

(1) Soil concentration is based on arithmetic average concentration.

(2) USEPA, 2003:Recommendations of the Technical Review Workgroup for Lead for an Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil. EPA-540-R-03-001. January 2003.

(3) USEPA, 2002: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, OSWER 9355.4-24, December 2002.

TABLE E.2

IEUBK MODEL INPUT PARAMETERS FOR LEAD IN ON-SITE GROUNDWATER
FOR THE PROTECTION OF THE OFF-SITE CHILD RESIDENT
RISK ASSESSMENT
SOUTH DAYTON DUMP AND LANDFILL SITE
MORAINE, OHIO

AIR CONCENTRATIONS				
Indoor Air Pb Concentrations: 30.0 percent of outdoor (default)				
Other Air Parameters:				
Age (Years)	*Time Outdoors (Hours)*	*Ventilation Rate (m^3/day)*	*Lung Absorption (%)*	*Outdoor Air (µg Pb/m^3)*
0.5-1	1.0	2.0	32.0	0.100
1-2	2.0	3.0	32.0	0.100
2-3	3.0	5.0	32.0	0.100
3-4	4.0	5.0	32.0	0.100
4-5	4.0	5.0	32.0	0.100
5-6	4.0	7.0	32.0	0.100
6-7	4.0	7.0	32.0	0.100

DIETARY INTAKE	
Default Concentrations (Variable)	
Age (Years)	*Dietary Intake (µg/day)*
0.5-1	2.26
1-2	1.96
2-3	2.13
3-4	2.04
4-5	1.95
5-6	2.05
6-7	2.22

DRINKING WATER CONCENTRATION	
Site-Specific Concentration: 3.24 µg Pb/L (mean)	
Age (Years)	*Water Consumption (L/day)*
0-1	0.20
1-2	0.50
2-3	0.52
3-4	0.53
4-5	0.55
5-6	0.58
6-7	0.59

SOIL AND DUST		
SOIL (Constant Concentration): 200 µg Pb/g (default)		
DUST: (Constant Concentration): 150 µg Pb/g (Average Multiple Source)		
Age (Years)	Soil (µg Pb/g)	House Dust (µg Pb/g)
0-1	200.000	150.000
1-2	200.000	150.000
2-3	200.000	150.000
3-4	200.000	150.000
4-5	200.000	150.000
5-6	200.000	150.000
6-7	200.000	150.000

MATERNAL CONTRIBUTION : Infant Model
Maternal Blood Concentration: 1.00 µg Pb/dL (default)

ABSORPTION METHODOLOGY: Non-Linear Active - Passive

ATTACHMENT E.1

IEUBK MODEL OUTPUTS

LEAD MODEL FOR WINDOWS Version 1.1

Model Version: 1.1 Build9
User Name: South Dayton Dump and Landfill Site
Date: 01/20/2010
Site Name: 38443 RPT11 South Dayton Dump
Operable Unit: Moraine, Ohio
Run Mode: Site Risk Assessment

Diet Data
default dietary lead intakes
Water Data
site-specific arithmetic mean on-Site groundwater lead concentration
Soil/Dust Data
default soil lead concentration

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (µg Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(µg/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 3.240 µg Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used
Average multiple source concentration: 150.000 µg/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (µg Pb/g)	House Dust (µg Pb/g)
.5-1	200.000	150.000
1-2	200.000	150.000
2-3	200.000	150.000
3-4	200.000	150.000
4-5	200.000	150.000
5-6	200.000	150.000
6-7	200.000	150.000

****** Alternate Intake ******

Age	Alternate (µg Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

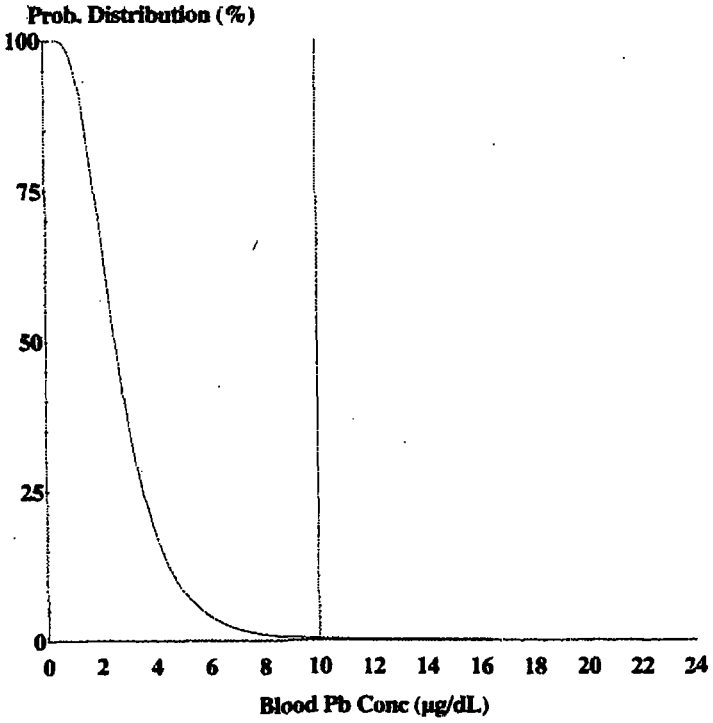
****** Maternal Contribution: Infant Model ******

Maternal Blood Concentration: 1.000 µg Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (µg/day)	Diet (µg/day)	Alternate (µg/day)	Water (µg/day)
.5-1	0.021	1.061	0.000	0.304
1-2	0.034	0.912	0.000	0.754
2-3	0.062	1.001	0.000	0.792
3-4	0.067	0.967	0.000	0.814
4-5	0.067	0.940	0.000	0.859
5-6	0.093	0.994	0.000	0.911
6-7	0.093	1.079	0.000	0.929

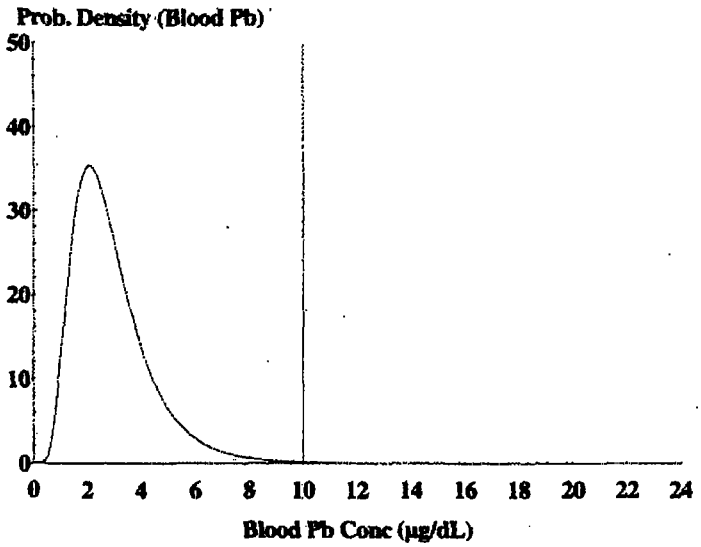
Year	Soil+Dust (µg/day)	Total (µg/day)	Blood (µg/dL)
.5-1	4.132	5.519	3.0
1-2	6.503	8.203	3.4
2-3	6.565	8.419	3.1
3-4	6.623	8.471	3.0
4-5	4.987	6.851	2.5
5-6	4.515	6.513	2.1
6-7	4.278	6.380	1.8



Cutoff = 10.000 µg/dl
Geo Mean = 2.672
GSD = 1.600
% Above = 0.249

Age Range = 0 to 84 months

Run Mode = Site Risk Assessment



Cutoff = 10.000 µg/dl
Geo Mean = 2.672
GSD = 1.600
% Above = 0.249
% Below = 99.751

Age Range = 0 to 84 months

Run Mode = Site Risk Assessment

APPENDIX F

ESTIMATION OF WORM UPTAKE FACTORS FOR PAHS

APPENDIX F

ESTIMATION OF WORM UPTAKE FACTORS FOR PAHS

Beyer and Stafford measured uptake of PAHs by earthworms in dredge spoils. However, use of uptake factors from Beyer and Stafford (1993) is problematic because the worms were analyzed before they had purged their guts. Thus, a considerable amount of some chemicals measured in the worms was associated with the soil in the guts. Beyer and Stafford suggest that the amount of ingested soil can be estimated by the observed uptake factor for aluminum, because they concluded that measured aluminum is almost all associated with ingested soil[1]. Based on this qualitative assessment, these authors conclude that "virtually all of the PAHs in the earthworms were in ingested soil". The UF for aluminum was 0.34, which suggests that about 1/3 of the total dry weight mass of the worm with soil gut contents was soil. Based on this assumption, the relative concentration of the worm with gut contents can be estimated as

$$33\% * [Soil] + 67\% * UF_{worm} * [Soil] = UF_{w+s} * [Soil]$$

Where [Soil] is the concentration of the compound in soil, UF worm is the uptake factor for the worm itself, and UFw+s is the observed uptake factor for the worm and unpurged soil. The equation can be simplified by dividing by [Soil] to yield

$$UF_{worm} * [Soil] = (UF_{w+s} - .33) / 0.67$$

UF_{w+s} for individual and total PAH are reported in Beyer and Stafford. Thus, the UFworm for each compound can be easily calculated, as shown in Table F.1 below. Notably, the estimated UF_{worm} for total PAHs is 0, suggesting rapid metabolism of PAHs by the worms. While there were some individual PAHs with UF_{worm} values above zero, Beyer and Stafford doubt that these differences are biologically significant. There was no relationship between UF_{worm} and molecular weight of the PAHs ($r = 0.27$, $p = 0.30$, Spearman-Rank Correlation), the latter potentially an indicator of biodegradability.

---

1 This supposition appears to be based on the common knowledge that aluminum if not readily incorporated into biological tissue. Data from Helmke et al. (1979) support this supposition. They estimated the bioaccumulation of a number of elements and found that several, including barium, chromium, iron, scandium, and thallium were not accumulated to any extent by earthworms. The authors note that except for barium, the elements having the lowest bioavailability "are ordinarily trivalent in soils and except for Fe, are generally biologically inert." Aluminum is also generally trivalent and also generally biologically inert.

Table F.1. Observed uptake factor for PAHs and other chemicals in unpurged worms, from Beyer and Stafford, and calculated uptake factors for the worms themselves.

Compound	UF_{w+s}	UF_{worm}
Aluminum	0.34	0.01
PCB	2.70	3.54
DDE	2.70	3.54
Acenaphthene	0.30	0.0*
Acenaphthylene	0.22	0.0*
Anthracene	0.32	0.0*
Benz(a)anthracene	0.27	0.0*
Benzo(a)pyrene	0.34	0.01
Benzo(b)fluoranthene	0.21	0.0*
Benzo(g,h,i)perylene	0.15	0.0*
Benzo(k)fluoranthene	0.21	0.0*
Chrysene	0.44	0.16
Dibenz(a,h)anthracene	0.49	0.24
Fluoranthene	0.37	0.06
Fluorene	0.20	0.0*
Indeno(1,2,3-cd)pyrene	0.41	0.12
Napthalene	0.21	0.0*
Phenanthrene	0.28	0.0*
Pyrene	0.39	0.09
Total PAH	0.30	0.0*

* UF_{worm} was mathematically negative, and set to zero.

Bioaccumulation of PAHs by earthworms can also be estimated with data supplied by Talley et al. (2002), who also conducted bioaccumulation experiments with earthworms living in dried sediments. In these experiments, the worms were allowed to purge their guts for 24 hours; thus, these data provide a more direct indication of worm bioaccumulation.

As with the Beyer and Stafford data, the Talley et al. data demonstrate low rates of bioaccumulation of PAHs by worms (Table F.2). On average, worms had about 7% of the PAH concentrations as soils, on a dry weight basis. Observed bioaccumulation varied by PAHs, and there was a marginally significant relationship between UF_{worm} and molecular weight of the PAHs ($r = 0.49$, $p = 0.052$, Spearman Rank Correlation). However, the UF_{worm} values estimated with these data showed no relationship with those estimated from the Beyer and Stafford data ($r = 0.27$, $p = 0.31$, Spearman Rank Correlation). On a dry weight worm to dry weight soil basis, UF_{worm} for total PAHs averaged 0.07. Worms are typically 83% water (EPA 1993), so a wet weight worm to dry

weight soil UF would be approximately 0.01 on a wet weight worm to dry weight soil basis.

Table F.2. PAH concentrations in soil and purged worms from Talley et al. All concentrations as dry weight.

PAH	*Soil Conc. mg/kg*	*Worm Conc. mg/kg*	UF_{worm}
Acenaphthene	2.08	0.03	0.02
Acenaphthylene	0.28	0.01	0.04
Anthracene	3.19	0.03	0.01
Benz(a)anthracene	6.67	0.54	0.08
Benzo(a)pyrene	6.81	1.10	0.16
Benzo(b)fluoranthene	7.36	1.34	0.18
Benzo(g,h,i)perylene	5.28	0.35	0.07
Benzo(k)fluoranthene	6.11	0.63	0.10
Chrysene	9.58	1.07	0.11
Dibenz(a,h)anthracene	1.11	0.13	0.11
Fluoranthene	21.67	0.71	0.03
Fluorene	2.22	0.02	0.01
Indeno(1,2,3-cd)pyrene	5.28	0.47	0.09
Napthalene	1.39	0.03	0.02
Phenanthrene	15.28	0.10	0.01
Pyrene	17.50	1.60	0.09
Sum of PAH	111.81	8.17	0.07

A third study, for worms living in a variety of contaminated soils, was conducted by Krauss et al. (2000, 2001). These authors report Biota to Soil Accumulation Factors (BSAF) values. Most of the PAHs had BSAF values between 0.10 to 0.20, although three intermediate molecular weight PAHs (fluorene, anthracene, and phenanthrene) had BSAF values between 0.25 and about 0.5 (Table F.3). These BSAF values are normalized to worm lipid, 1.2 percent of wet weight, and soil carbon, which averaged 3.4 percent. To make these values comparable to the other two analyses, these were converted to a dry weigh worm to dry weight soil UFworm. The effects of carbon and lipid were removed by multiplying by 3.4 percent/1.2 percent, and then these values were converted to dry weigh worm UF by dividing by 0.17 percent.

As can be seen (Table F.3), values reported by Krauss et al. are considerably higher than those reported by the previous two analysts. These differences could be due to differences in soil texture or organic carbon. Dredged sediments might tend to be finer grained and have higher organic carbon than soils. In view of this uncertainty, the

average UF_{worm} from Krauss et al. (0.47) was selected as the appropriate value to estimate earthworm concentrations. This value is equal to a wet weight worm to dry weight soil UF of 0.08. For simplicity and conservatism, a value of 0.10 was used in the food chain analyses.

Table F.3. BSAF values for worms reported by Krauss et al. BSAF values are expressed on a lipid and organic carbon basis. The UF_{worm} is expressed on a dry weight worm to dry weight soil basis.

PAH	*BSAF*	UF_{worm}
Acenaphthene	0.23	0.29
Acenaphthylene	0.17	0.35
Anthracene	0.43	0.47
Benz(a)anthracene	0.18	1.06
Benzo(a)pyrene	0.21	0.63
Benzo(b + k)fluoranthene	0.17	0.88
Benzo(e)pyrene	0.23	0.37
Benzo(g,h,i)perylene	0.16	0.35
Chrysene	0.24	0.38
Dibenz(a,h)anthracene	0.17	0.50
Fluoranthene	0.18	0.35
Fluorene	0.51	0.43
Indeno(1,2,3-cd)pyrene	0.21	0.47
Napthalene	0.14	0.40
perylene	0.19	0.43
Phenanthrene	0.31	0.35
Pyrene	0.17	0.34
Average for all PAHs	0.23	0.47

Beyer, W. N., and Stafford, C. 1993. Survey and evaluation of contaminants in earthworms and in soils derived from dredged material at confined disposal facilities in the Great Lakes region. Environ. Mon. Assess. 24:151-165.

Helmke, P.A., W.P. Robarge, R. L. Korotev, and P. J. Schomberg. 1979. Effects of soils -applied sewage sludge on concentrations of elements in earthworms. J. Environ. Quality 8: 322-327.

Krauss, M., W. Wilcke, and W. Zech. 2000. Availability of polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) to earthworms in urban soils. Environ. Sci. Technol. 34: 4335-4340.

Krauss, M. and . Wilcke. 2001. Predicting soil-water partitioning of polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) by desorption with methanol-water mixtures at different temperatures. Environ. Sci. Technol. 35: 2319-2325.

Talley, J. W., Ghosh, U., Tucker, S. G., Gurey, J. S., and Luthy, R. 2002. Particle-Scale understanding of the bioavailability of PAHs in sediment. Environ. Sci. Technol. 36:477-483.

APPENDIX G′

BIOACCUMULATION OF CHLORINATED ORGANICS

APPENDIX G

BIOACCUMULATION OF CHLORINATED ORGANICS

Information regarding the bioaccumulation potential of hydrophobic, poorly metabolized chemicals, such as PCBs, by small herbivorous and omnivorous animals is limited. A review of available data for this class of chemicals suggests that biota to soil accumulation factors (BSAF) range from less than 0.01 to a maximum of about 5 (Table G.1). The geometric mean is about 0.1 (mg/kg wet weight small vertebrate prey to mg/kg dry weight in soil). Higher values tend to come from systems with very low concentrations and uncertain sources of contamination, such as PCBs in agricultural fields and DDT from cereal crop fields[1] (Hebert et al., 1994). These high BSAF values are suspect because the dominant source of contaminants to these areas is likely to be atmospheric deposition. The apparent soil to mammal bioaccumulation in these cases will be artificially elevated because the primary exposure route would be from direct deposition onto the plants, as opposed to uptake by the plants of soil bound chemicals (which is generally negligible for very hydrophobic compounds). An analogous situation occurs for mercury, which is also not bioavailable to plants but is widely dispersed in the air. Even in cases in which the soil had been spiked with mercury, 90 to 95 percent of the mercury in above ground plant tissues came from atmospheric deposition rather than root uptake (Mosbaek et al., 1988).

In contrast, the exposure of a small vertebrate to COPCs at the South Dayton Landfill Site is primarily through ingestion of chemicals initially bioaccumulated by plants. This will be limited because plants do not readily bioaccumulate very hydrophobic compounds (Travis and Arms 1988).

1 DDT was not widely used on cereal crops. Therefore, the DDT measured in the soil at the site discussed in Hebert et al. could have been due to background sources rather that agricultural use. In contrast, DDT was widely used on fruit, and the high concentrations of DDT found in an orchard area considered by Hebert et al. were probably associated with intentional application.

TABLE G.1

LITERATURE VALUES OF BIOTA TO SOIL ACCUMULATION FACTORS (BSAF) OF NON-METABOLIZABLE ORGANOCHLORINES BY SMALL RODENTS

Compound	*Soil Conc.*	*Rodent Conc.*	BSoilAF	*Source of Chemical/Habitat*	*Reference*
TCDD	25	2.25	0.09	Pulp sludge application/forest	ERT 1987
TCDD	21	11	0.52	Pulp sludge application/forest	ERT 1987
TCDD	10	1.25	0.13	Pulp sludge application/forest	ERT 1987
TCDD	31	8	0.26	Pulp sludge application/forest	ERT 1987
TCDD	10.8	4.0	0.37	Pulp sludge application/forest	Thiel et al. 1989
TCDD	3500	1125	0.32	Explosion at Serveso/urban	Fanelli et al. 1980
DDT	0.0015*	0.0004*	0.02	Agriculture?/terrestrial habitat	Hebert et al. 1994
DDE	0.0370*	0.0027*	0.07	Agriculture?/terrestrial habitat	Hebert et al. 1994
DDD	0.0011*	0.0004*	0.37	Agriculture?/terrestrial habitat	Hebert et al. 1994
t-DDT	141	0.20	0.001	DDT spill/old industrial site	Menzie et al. 1992
DDE	0.004	0.009	2.5	Agriculture?/cereal cropland	Hebert et al. 1994
DDE	0.343	0.006	0.03	Agriculture/Orchard	Hebert et al. 1994
PCB #118	0.00044*	0.0015*	3.3	No known release/rural land	Hebert et al. 1994
PCB #138	0.00033*	0.0019*	5.9	No known release/rural land	Hebert et al. 1994
PCB	47.7	0.19	0.004	PCB spill /wetland	Charters et al. 1993
PCB	44.3	0.16	0.004	PCB spill/wetland	Charters et al. 1993
PCB	64	0.10	0.001	PCB spill/wetland	Charters et al. 1993
PCB	6.5	0.13	0.02	PCB spill	Blakenship et al. 2005
Geomean			0.08		

Notes:

* Geometric mean of ranges provided in that reference.

(1) All soil concentrations are in mg/kg DW except for TCDD concentrations are in µg/kg DW.

(2) All rodent concentrations are in µg/kg WW except for TCDD concentrations are in ng/kg WW.

Blankenship, A.L. M. J. Zwiernik, K.K. Coady, D. P. Kay, J. L. Newsted, K. Ktrause, C. Park, P. W. Bradley, A. M. Neigh, S. D. Millsap, P. D. Jones, and J. P. Giesy. 2005. Differential accumulation of polychlorinated biphenyl congeners in the terrestrial food web of the Kalamazoo River Superfund Site, Michigan. Environ. Sci. Technol. 39: 5954–5963.

Charters, D. W., K. Kracko, and P. Bovitz, 1993. Final Report Ecological Assessment Burnt Fly Bog Marlboro, New Jersey. USEPA Environmental Response Team.

ERT. 1987. "Land treatment effects on wildlife populations in red pine plantations: final report", prepared for Nekoosa Papers, Inc., p. 160.

Fanelli, R., et al. 1980. "Presence of 2,3,7,8-Tetrachloro dibenzo-p-dioxin in wildlife living near Seveso, Italy: a preliminary study", *Bull. Environ. Contam. Toxicol.* 24, 460-2.

Hebert, C.E., D.V. Weseloh, L. Kot, and V. Glooschenko, 1994. Organochlorine Contaminants in a Terrestrial Foodweb on the Niagara Peninsula, Ontario, Canada 1987-89. Arch. Environ. Contam. Toxicol. 26:356-366.

Menzie, C.A., D.E. Burmaster, J.S. Freshman, and C.A. Callahan. 1992. "Assessment of methods for estimating ecological risk in the terrestrial component: a case study at the Baird & McGuire Superfund Site in Holbrook, Massachusetts." Environ. Tox. Chem. 11:245-260.

Mosbaek, H., J. C. Tjell, and T. Sevel (1988) Plant Uptake of Mercury in Background Areas. *Chemosphere* 17(6):1227-1236.

Sample, B.E., J.J. Beauchamp, R.A. Emroymson, and G.W. Suter, II. 1998b. Development and validation of bioaccumulation models for small mammals. ES/ER/TM-219. U.S. Department of Energy, Office of Environmental Management, Washington, DC.

Thiel, D.A., S.G. Martin, J.W. Duncan, and W.R. Lance, 1989. The Effects of a Sludge Containing Dioxin on Wildlife in Pine Plantations. Environmental Control, pp. 94-99.

Thomann, R. V. and J. Komlos. 1999. Model of biota-sediment accumulation factor for polycyclic aromatic hydrocarbons. Environmental Toxicology and Chemistry: Vol. 18, No. 5, pp. 1060–1068.

Travis, C. C. and Arms, A. 1988. Bioconcentration of organics in beef, milk, and vegetation. Environ. Sci. Tech. 22: 271-274.