FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: S

DESCRIPTION: View of marker of buried high pressure gas line that runs through the Tree Farm property.

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: N

DESCRIPTION: View of fill area (open field) in the southwest corner of the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 04/13/2011

DIRECTION OF PHOTOGRAPH: N

DESCRIPTION: View of fill area (open field) on the south side of the Tree Farm property.

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: Toward ground

DESCRIPTION: View of surface depression in fill area on south side of the Tree Farm property

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH:
N

DESCRIPTION: View of tree nursery in the northeast corner of the Tree Farm property.

DATE: 03/30/2011

DIRECTION OF PHOTOGRAPH:
S

DESCRIPTION: View of divots from harvested trees in the tree nursery area at the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: E

DESCRIPTION: View of Honeywell Ditch along the south property boundary of the Tree Farm property.

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: E

DESCRIPTION: View of drain pipe along the Honeywell Ditch on the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: W

DESCRIPTION: View of drive on the east side of the Tree Farm property, near a building footprint.

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: E

DESCRIPTION: View of gravel pile at the east side of the Tree Farm property, near a building footprint.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: NW

DESCRIPTION: View of refrigerator located on the edge of the fill area located in the southwest corner of the Tree Farm property.

DATE: 04/26/2011

DIRECTION OF PHOTOGRAPH: NW

DESCRIPTION: View of 55-gallon drum and concrete debris, on the edge of fill area in the southwest corner of the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: Toward ground

DESCRIPTION: View of 55-gallon drum and fuel tank along edge of fill area in the southwest corner of the Tree Farm property.

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: S

DESCRIPTION: View of debris breaching ground surface in fill area in southwest corner of the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: Toward ground

DESCRIPTION: View of 5-gallon metal bucket on the Tree Farm property.

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: Toward ground

DESCRIPTION: View of television on the east side of the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: Toward ground

DESCRIPTION: View of building foundation and crushed paint bucket on the east side of the Tree Farm property.

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: N

DESCRIPTION: View of roofing shingles on east side of the Tree Farm property near building foundations.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: S

DESCRIPTION: View of empty gasoline can near the center of the Tree Farm property.

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: NE

DESCRIPTION: Close-up view of rusty 55-gallon drum carcass on the east side of the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 04/26/2011

DIRECTION OF PHOTOGRAPH: E

DESCRIPTION: View of partially full Standard Oil Co. drum (55-gallon) on the east side of the Tree Farm property.

DATE: 04/26/2011

DIRECTION OF PHOTOGRAPH: Toward ground

DESCRIPTION: Close-up view of a Standard Oil Co. drum on the east side of the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: NE

DESCRIPTION: View of building foundation remains on the east side of the Tree Farm property.

DATE: 03/28/2011

DIRECTION OF PHOTOGRAPH: N

DESCRIPTION: View of building foundation remains on the east side of the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM
U.S. EPA ID #: MIB000000166

DATE: 03/30/2011

DIRECTION OF PHOTOGRAPH: Toward ground

DESCRIPTION: View of uprooted tree near the center of the Tree Farm property.

DATE: 03/30/2011

DIRECTION OF PHOTOGRAPH: N

DESCRIPTION: View of tires near the center of the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM PAGE: 16 OF 17
U.S. EPA ID #: MIB000000166

DATE: 04/13/2011

DIRECTION OF PHOTOGRAPH: W

DESCRIPTION: View of culvert and surface drainage near the center of the Tree Farm property; some surface drainage in the area.

DATE: 04/13/2011

DIRECTION OF PHOTOGRAPH: Toward ground

DESCRIPTION: View of deteriorating plastic drum near fill area in the southwest corner of the Tree Farm property.

FIELD PHOTOGRAPHY LOG SHEET

PROPERTY NAME: TREE FARM PAGE: 17 OF 17
U.S. EPA ID #: MIB000000166

DATE: 03/30/2011

DIRECTION OF PHOTOGRAPH: W

DESCRIPTION: Distance view of two concrete vault openings (possible septic tank) on east side of the Tree Farm property near building foundations; along with a computer monitor at surface.

DATE: 03/30/2011

DIRECTION OF PHOTOGRAPH:

DESCRIPTION: Close-up view of one of the concrete vault openings (possible septic tank) on east side of the Tree Farm property near building foundations.

Appendix C

Appendix C

Geophysical Survey

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: Teresa Ducsay, Environmental Quality Analyst
Site Assessment and Site Management Unit, Superfund Section

FROM: Charles Graff, Senior Geologist
Geology and Defense Site Management Unit, Superfund Section C.W.G.

DATE: August 31, 2011

SUBJECT: Geophysical Survey Performed at the Tree Farm Property in Rochester Hills, Michigan, Spring 2011.

Introduction

As part of a Brownfield assessment of the Tree Farm Property, staff of the MDEQ performed a geophysical survey of the property to evaluate the potential for buried drums, tanks, or other metal debris that might be sources for buried contamination at the property. For this purpose, a Geonics EM61-Mark 2 unit was rented for metal detection. This is a high sensitivity high resolution four-channel time domain electromagnetic metal detector that detects conductive material and objects (both ferrous and non-ferrous metal) below the ground surface, i.e., metal drums and debris. It has advantages over similar equipment in that it can still provide accurate data on subsurface metal objects when used nearby metal structures located at the surface, e.g., chain-link fences, metal buildings, or vehicles.

Staff conducted site reconnaissance on the property prior to performing the geophysical survey to evaluate those areas that appeared to have the most potential for containing buried waste. The property was heavily overgrown with shrubs, saplings, small to large trees, and phragmites plants located in the lower lying areas that contained more saturated soils. Much of the vegetation on the flat-lying areas had to be removed in order to perform the geophysical survey adequately. It was apparent from the reconnaissance visit that two main areas in particular had been filled in and were good candidates for electromagnetic work.

Specifics of the Instrument and the Survey Process

The EM61-Mark 2 unit consists of two electromagnetic coils of 1 meter by 0.5 meter mounted on a small pull-along trailer with two wheels. The operator carries the batteries and electronics on a backpack and carries a handheld computer that is used to set up and store the data (data logger) from the coils while pulling the trailer along the survey transects.

The electromagnetic readings were taken when an odometer mounted on the axle of the trailer wheel triggered the data logger to record the measurements at intervals of 0.193 meters, or 0.63 feet (< 8 inches). A Trimble GeoXH Global Positioning System

Figure 1: General Site Map With Geophysical Survey Areas

Tree Farm Property-EM61-Mark 2 Electromagnetic Results

Legend

- Property Boundary
- West Area
- East Area

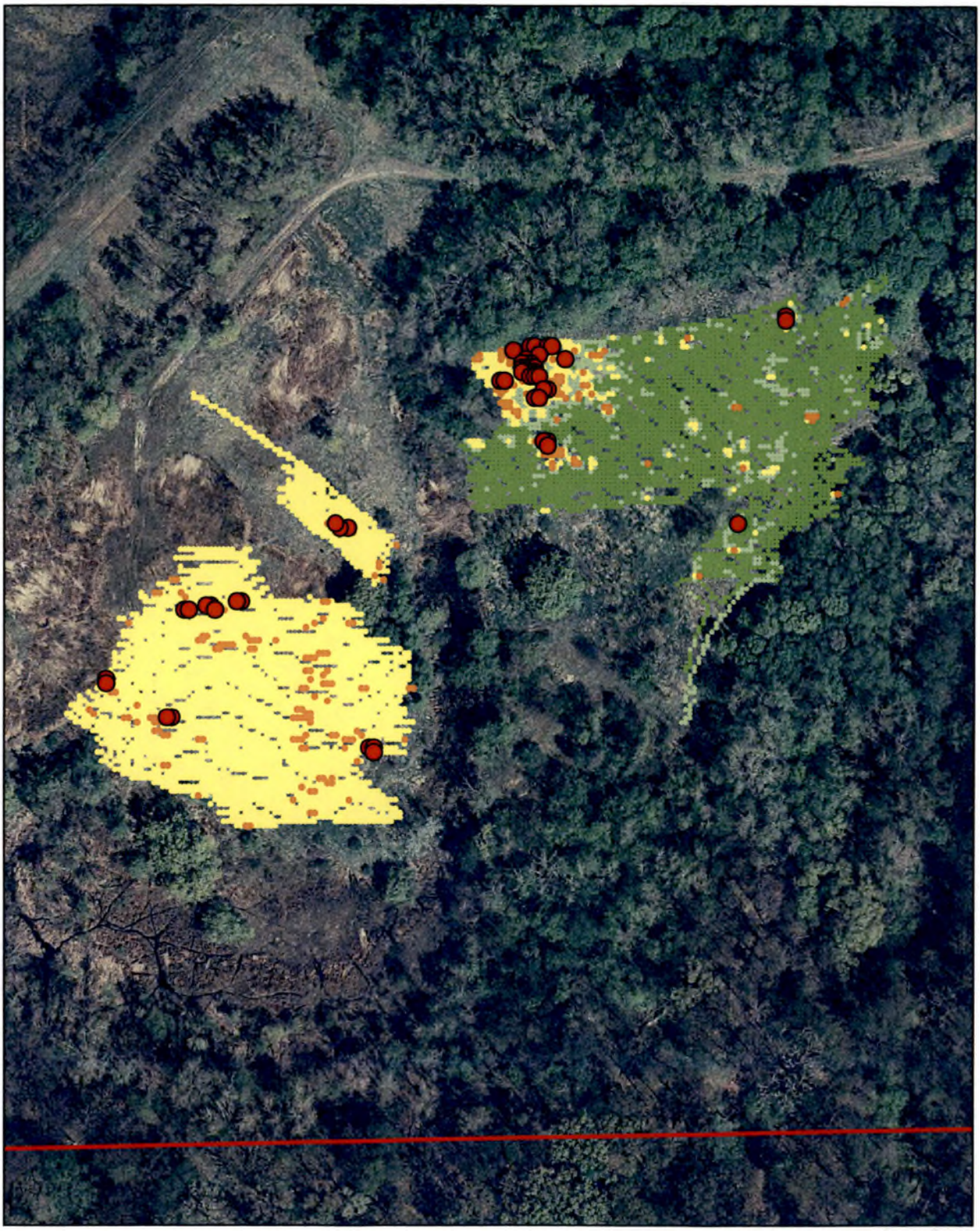
Tree Farm
1406 East Avon Road
Rochester Hills, MI 48307
T3N R11E Section 24
Oakland County
MIB000000166

0 75 150 300 450 600 Feet

N
W E
S

Compiled by CW Graff, 7-8-11, Michigan Georef NAD 83m, ArcView 9.3.1, Michigan Geographic Data Library, TreeFarm_MGR83.mxd

Figure 2. Western and Eastern EM Survey Areas, Channel 1



Legend

EM and GPS Data

Channel 1

- -1172.00000 - -839.00000
- -838.99999 - -276.00000
- -275.99999 - 1088.00000
- 1088.00001 - 4302.00000
- 4302.00001 - 11796.00000

Tree Farm Property EM61-Mark 2 Electromagnetic Results

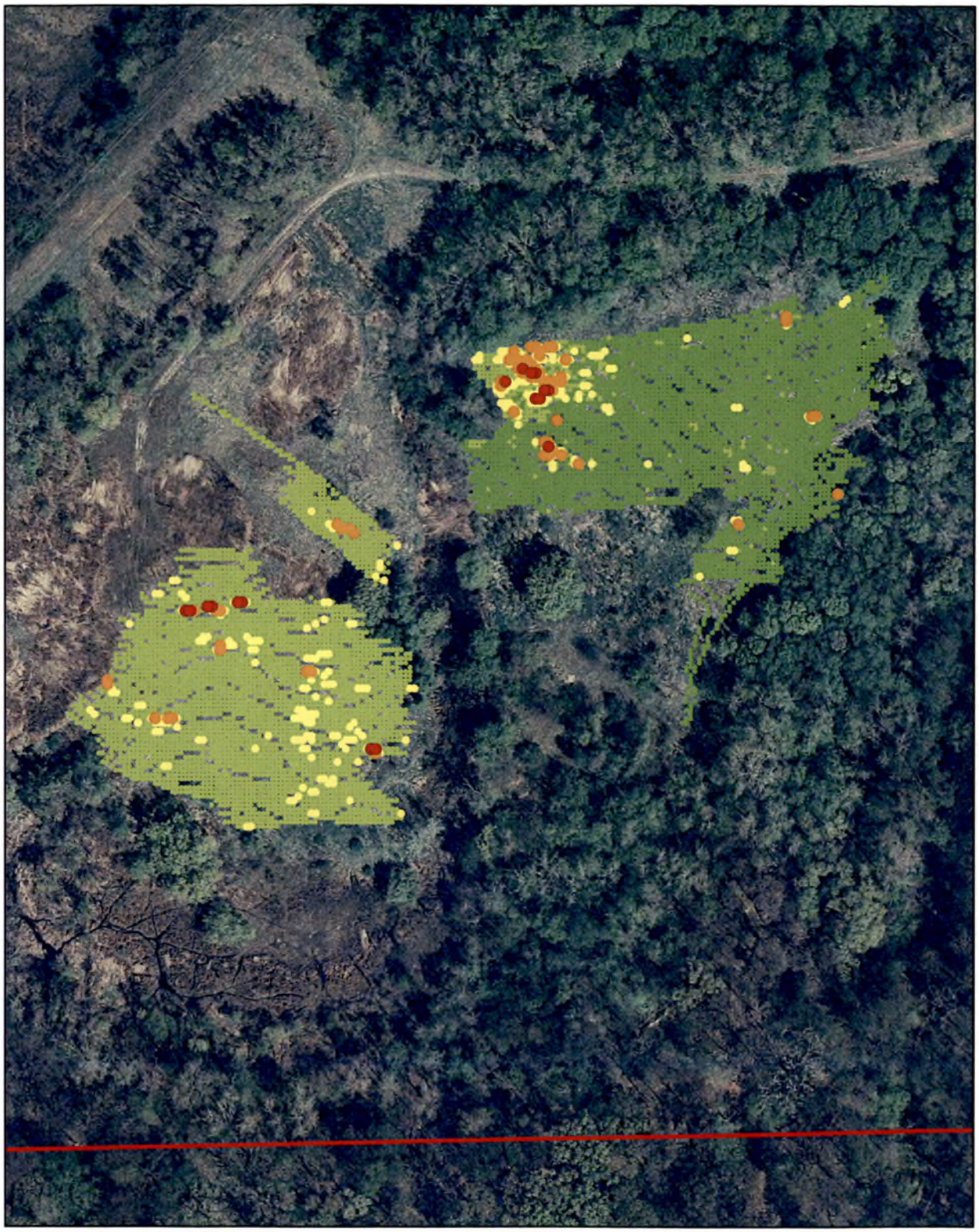
Tree Farm
1406 East Avon Road
Rochester Hills, MI 48307
T3N R11E Section 24
Oakland County
MIB000000166

0 30 60 120 180 240 Feet

N
W E
S

Compiled by CW Graff, 7-8-11, Michigan Georef NAD 83m, ArcView 9.3.1, Michigan Geographic Data Library, TreeFarm_MGR83.mxd

Figure 3. Western and Eastern EM Survey Areas, Channel 2



Legend

EM and GPS Data

Channel 2

- -1172.00000 - -839.00000
- -838.99999 - -276.00000
- -275.99999 - 1088.00000
- 1088.00001 - 4302.00000
- 4302.00001 - 11796.00000

Tree Farm Property EM61-Mark 2 Electromagnetic Results

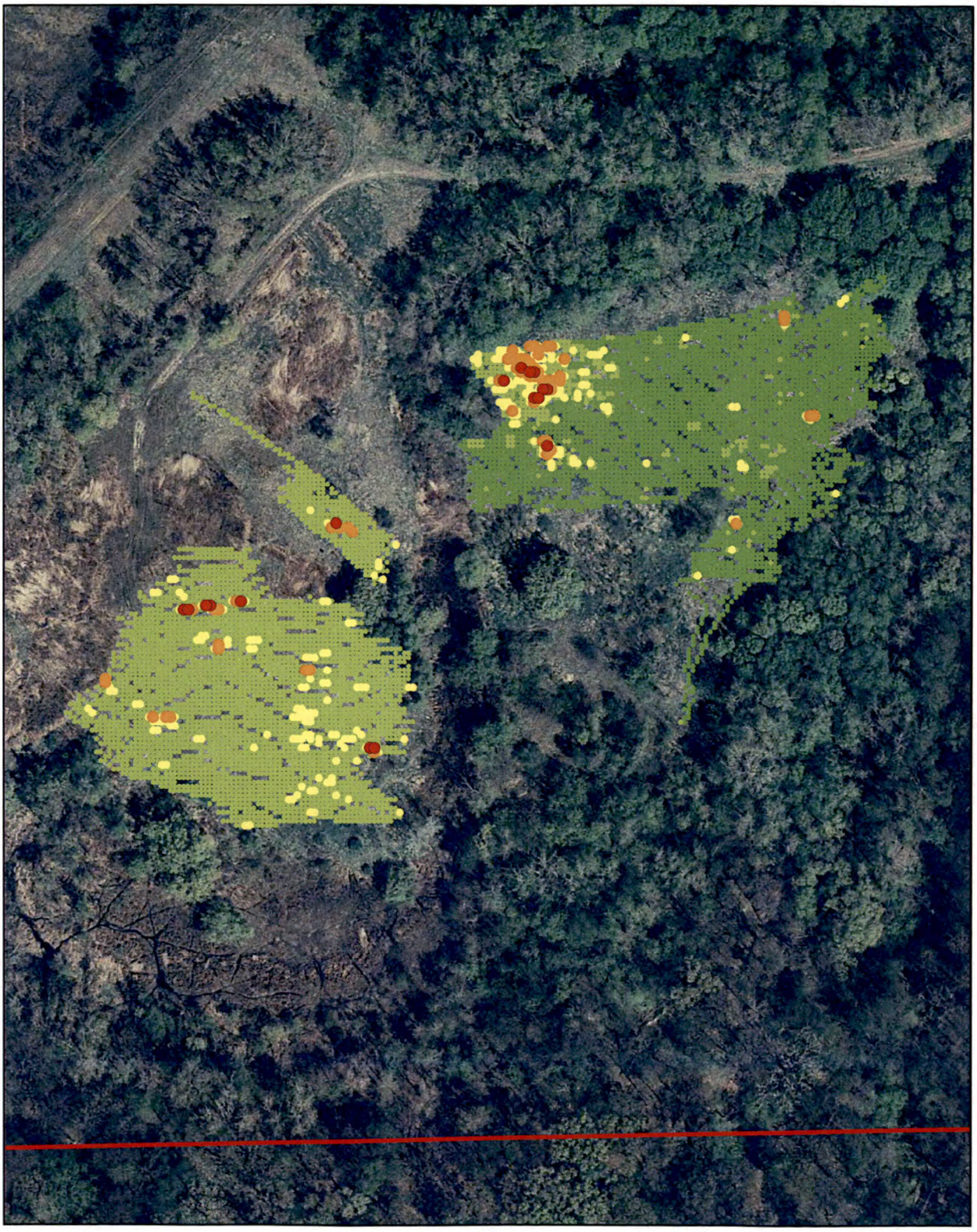
Tree Farm
1406 East Avon Road
Rochester Hills, MI 48307
T3N R11E Section 24
Oakland County
MIB000000166

0 30 60 120 180 240 Feet

N
W E
S

Compiled by CW Graff, 7-8-11, Michigan Georef NAD 83m, ArcView 9.3.1, Michigan Geographic Data Library. TreeFarm_MGR83.mxd

Figure 4. Western and Eastern EM Survey Areas, Channel 3



Legend

EM and GPS Data

Channel 3

- -1172.00000 - -839.00000
- -838.99999 - -276.00000
- -275.99999 - 1088.00000
- 1088.00001 - 4302.00000
- 4302.00001 - 11796.00000

Tree Farm Property EM61-Mark 2 Electromagnetic Results

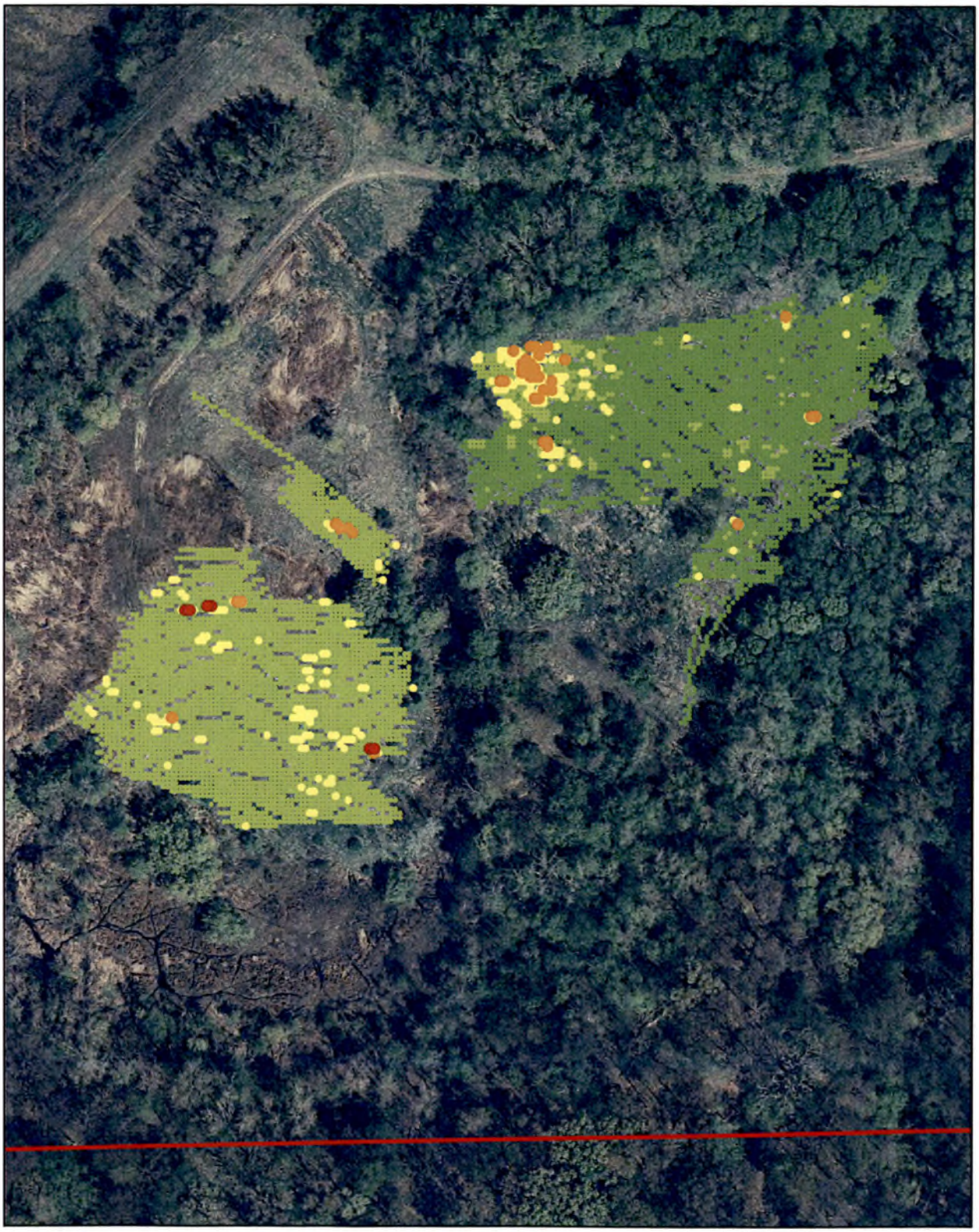
Tree Farm
1406 East Avon Road
Rochester Hills, MI 48307
T3N R11E Section 24
Oakland County
MIB000000166

0 30 60 120 180 240 Feet

N
W E
S

Compiled by CW Graff, 7-8-11, Michigan Georef NAD 83m, ArcView 9.3.1, Michigan Geographic Data Library, TreeFarm_MGR83.mxd

Figure 5. Western and Eastern EM Survey Areas, Channel 4



Legend

EM and GPS Data

Channel 4

- -1172.00000 - -839.00000
- -838.99999 - -276.00000
- -275.99999 - 1088.00000
- 1088.00001 - 4302.00000
- 4302.00001 - 11796.00000

Tree Farm Property EM61-Mark 2 Electromagnetic Results

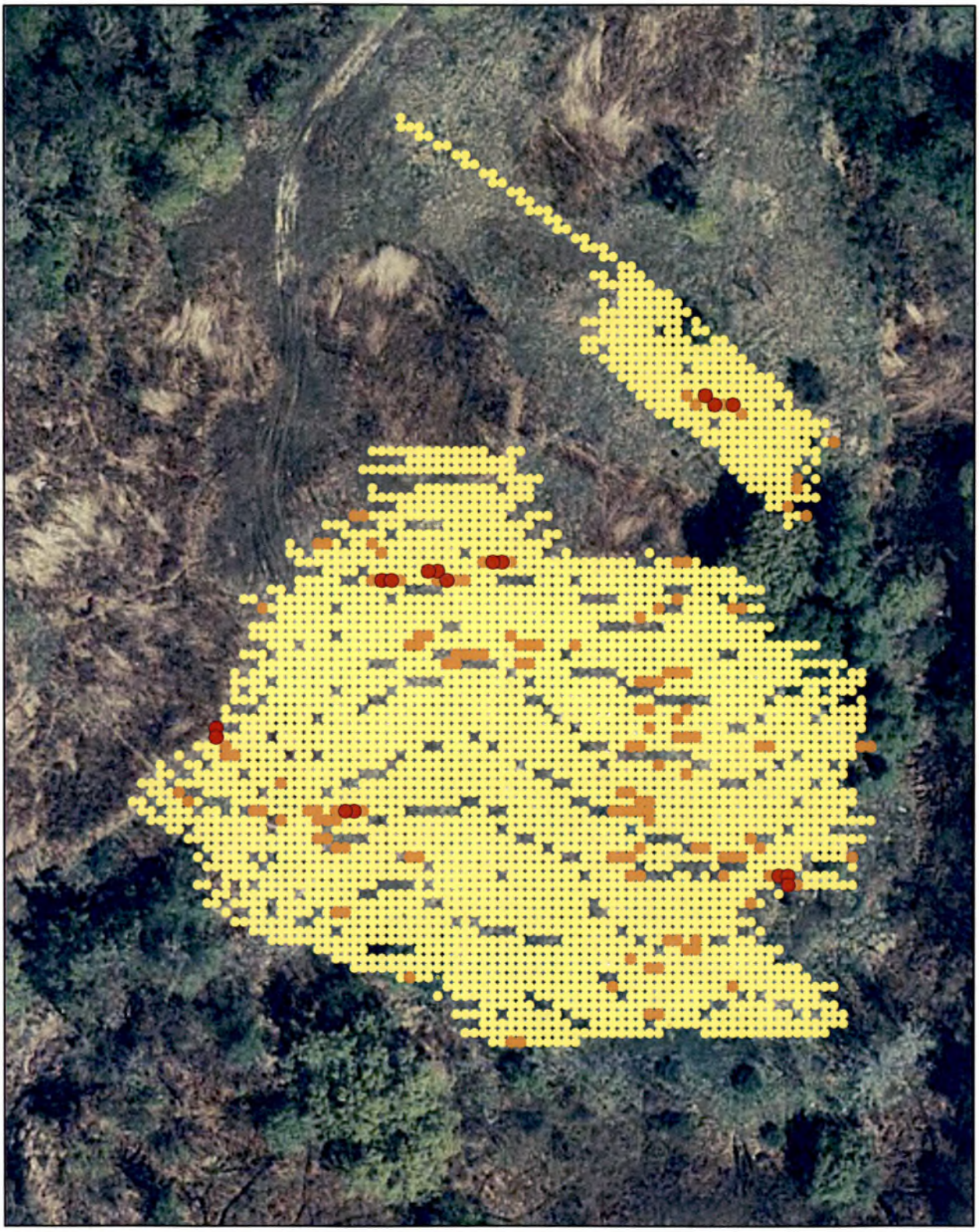
Tree Farm
1406 East Avon Road
Rochester Hills, MI 48307
T3N R11E Section 24
Oakland County
MIB000000166

0 30 60 120 180 240 Feet

N
W E
S

Compiled by CW Graff, 7-8-11, Michigan Georef NAD 83m, ArcView 9.3.1, Michigan Geographic Data Library, TreeFarm_MGR83.mxd

Figure 6. Close Up View of Western EM Survey Area, Channel 1



Legend

EM and GPS Data

Channel 1

- -1172.00000 - -839.00000
- -838.99999 - -276.00000
- -275.99999 - 1088.00000
- 1088.00001 - 4302.00000
- 4302.00001 - 11796.00000

Tree Farm Property EM61-Mark 2 Electromagnetic Results

Tree Farm
1406 East Avon Road
Rochester Hills, MI 48307
T3N R11E Section 24
Oakland County
MIB000000166

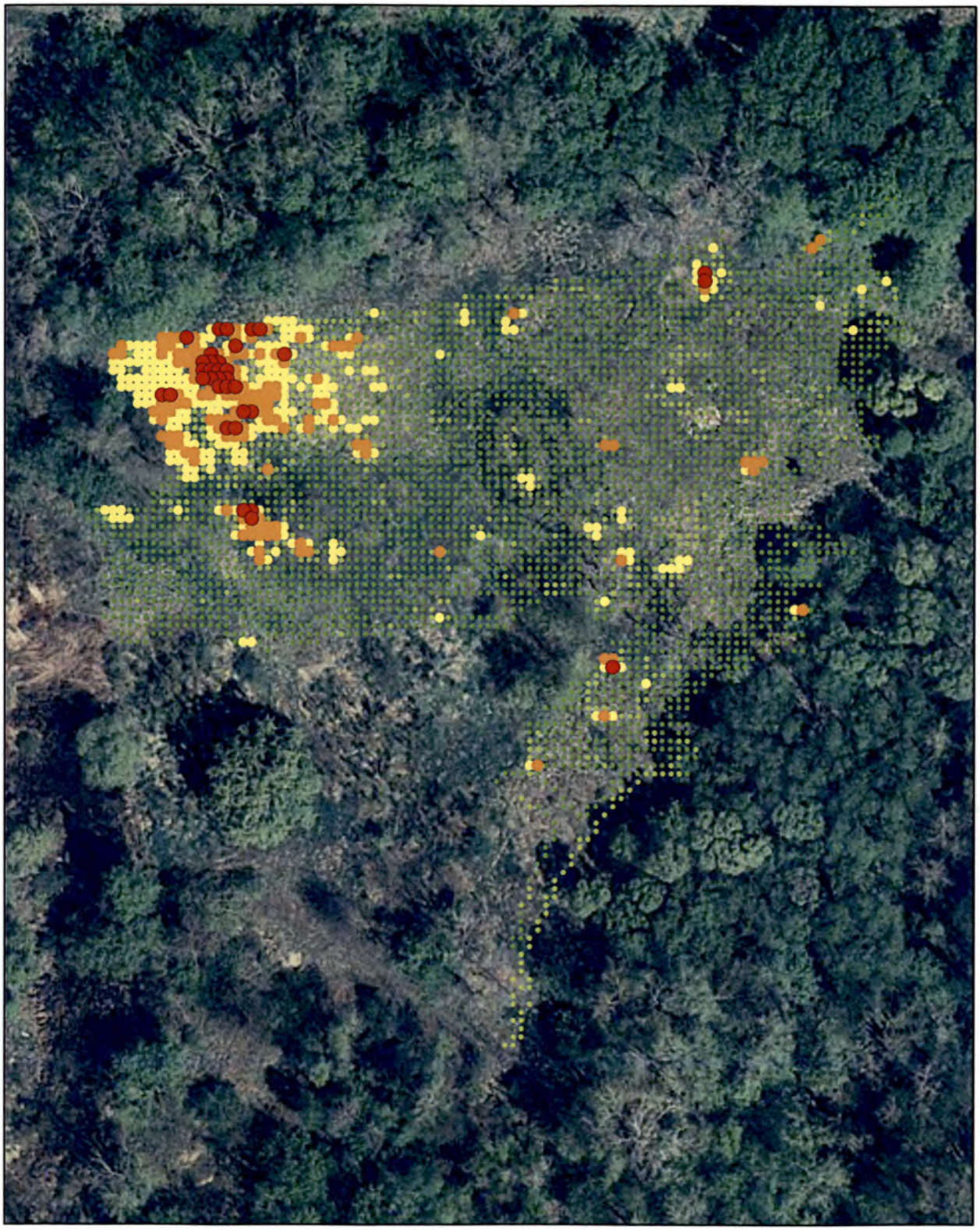
0 15 30 60 90 120 Feet

100

N
W E
S

Compiled by CW Graff, 7-8-11, Michigan Georef NAD 83m, ArcView 9.3.1, Michigan Geographic Data Library, TreeFarm_MGR83.mxd

Figure 7. Close Up View of Eastern EM Survey Area, Channel 1



Legend

EM and GPS Data

Channel 1

- -1172.00000 - -839.00000
- -838.99999 - -276.00000
- -275.99999 - 1088.00000
- 1088.00001 - 4302.00000
- 4302.00001 - 11796.00000

Tree Farm Property EM61-Mark 2 Electromagnetic Results

Tree Farm
1406 East Avon Road
Rochester Hills, MI 48307
T3N R11E Section 24
Oakland County
MIB000000166

0 15 30 60 90 120 Feet

N
W E
S

Compiled by CW Graff, 7-8-11, Michigan Georef NAD 83m, ArcView 9.3.1, Michigan Geographic Data Library, TreeFarm_MGR83.mxd

Appendix D

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: TMW-10 (6.5'-7.5')

Lab ID: 1510021-06

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Pesticides									
789-02-6	2,4'-DDT	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
72-54-8	4,4'-DDD	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
72-55-9	4,4'-DDE	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
50-29-3	4,4'-DDT	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
319-84-6	a-BHC	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
5103-71-9	a-Chlordane	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
309-00-2	Aldrin	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
319-85-7	b-BHC	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
319-86-8	d-BHC	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
60-57-1	Dieldrin	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
959-98-8	Endosulfan I	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
33213-65-9	Endosulfan II	ND	0.030	ug/L	1	10/08/15	B5I3014	8081/8082	
1031-07-8	Endosulfan sulfate	ND	0.050	ug/L	1	10/08/15	B5I3014	8081/8082	
72-20-8	Endrin	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
7421-93-4	Endrin aldehyde	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	A08
53494-70-5	Endrin ketone	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
58-89-9	g-BHC (Lindane)	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
5103-74-2	g-Chlordane	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
76-44-8	Heptachlor	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
1024-57-3	Heptachlor epoxide	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
87-82-1	Hexabromobenzene	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
72-43-5	Methoxychlor	ND	0.050	ug/L	1	10/08/15	B5I3014	8081/8082	
2385-85-5	Mirex	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
59080-40-9	PBB (BP-6)	ND	0.050	ug/L	1	10/08/15	B5I3014	8081/8082	
8001-35-2	Toxaphene	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
Surrogate: Decachlorobiphenyl			*65.6 %*	*30-150*		*10/08/15*	B5I3014	*8081/8082*	
Surrogate: Tetrachloro-m-xylene			*34.1 %*	*30-150*		*10/08/15*	B5I3014	*8081/8082*	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: TMW-10 (6.5'-7.5')

Lab ID: 1510021-06

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-PCBs as Aroclors									
12674-11-2	Aroclor 1016	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11104-28-2	Aroclor 1221	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11141-16-5	Aroclor 1232	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
53469-21-9	Aroclor 1242	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
12672-29-6	Aroclor 1248	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11097-69-1	Aroclor 1254	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11096-82-5	Aroclor 1260	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
37324-23-5	Aroclor 1262	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11100-14-4	Aroclor 1268	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
Surrogate: Decachlorobiphenyl			*67.0 %*	*30-150*		*10/08/15*	B5I3014	*8081/8082*	
Surrogate: Tetrachloro-m-xylene			*34.7 %*	*30-150*		*10/08/15*	B5I3014	*8081/8082*	
Inorganics-General Chemistry									
57-12-5	Total Cyanide	ND	0.050	mg/L	10	10/02/15	B5J0209	ASTM D7511-09	I
Inorganics-Metals									
7440-36-0	Antimony	ND	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-38-2	**Arsenic**	**11**	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-39-3	**Barium**	**82**	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-41-7	Beryllium	ND	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-43-9	Cadmium	ND	0.2	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-47-3	Chromium	ND	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-48-4	Cobalt	ND	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-50-8	Copper	ND	1.0	ug/L	1	10/14/15	B5J0602	6020/200.8	
7439-89-6	**Iron**	**11000**	20	ug/L	1	10/16/15	B5J0602	6010/200.7	
7439-92-1	Lead	ND	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7439-96-5	**Manganese**	**440**	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7439-97-6	Mercury	ND	0.2	ug/L	1	10/15/15	B5J1405	7470/245.1	
7439-98-7	Molybdenum	ND	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-02-0	**Nickel**	**7.3**	2.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7782-49-2	Selenium	ND	1.0	ug/L	1	10/14/15	B5J0602	6020/200.8	
7440-22-4	Silver	ND	0.2	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-28-0	Thallium	ND	2.0	ug/L	1	10/14/15	B5J0602	6020/200.8	
7440-62-2	Vanadium	ND	2.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-66-6	Zinc	ND	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

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ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: TMW-02 (13'-14') DUP

Lab ID: 1510021-07

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
96-18-4	1,2,3-Trichloropropane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
526-73-8	1,2,3-Trimethylbenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
106-93-4	1,2-Dibromoethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
95-50-1	1,2-Dichlorobenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
08-67-8	1,3,5-Trimethylbenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
541-73-1	1,3-Dichlorobenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
106-46-7	1,4-Dichlorobenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
591-78-6	2-Hexanone	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
91-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	X
67-64-1	2-Propanone (acetone)	ND	20	ug/L	1	10/02/15	B5J0207	8260	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
107-13-1	Acrylonitrile	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
71-43-2	Benzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
108-86-1	Bromobenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
74-97-5	Bromochloromethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-27-4	Bromodichloromethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-25-2	Bromoform	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
74-83-9	Bromomethane	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
75-15-0	Carbon disulfide	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
56-23-5	Carbon tetrachloride	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
108-90-7	Chlorobenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-00-3	Chloroethane	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
67-66-3	Chloroform	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
74-87-3	Chloromethane	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
10061-01-5	cis-1,3-Dichloropropylene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
110-82-7	Cyclohexane	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
24-48-1	Dibromochloromethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	

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TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: TMW-02 (13'-14') DUP

Lab ID: 1510021-07

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Volatiles									
74-95-3	Dibromomethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-71-8	Dichlorodifluoromethane	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
60-29-7	Diethyl ether	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
108-20-3	Diisopropyl Ether	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
100-41-4	Ethylbenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
637-92-3	Ethyltertiarybutylether	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
67-72-1	Hexachloroethane	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
98-82-8	Isopropylbenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
1330-20-7	m & p - Xylene	ND	2.0	ug/L	1	10/02/15	B5J0207	8260	
74-88-4	Methyl iodide	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-09-2	Methylene chloride	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
1634-04-4	Methyltertiarybutylether	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
91-20-3	Naphthalene	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	X
104-51-8	n-Butylbenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
103-65-1	n-Propylbenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
95-47-6	o-Xylene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
99-87-6	p-Isopropyl toluene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
135-98-8	sec-Butylbenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
100-42-5	Styrene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
98-06-6	tert-Butylbenzene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-65-0	tertiary Butyl Alcohol	ND	50	ug/L	1	10/02/15	B5J0207	8260	
994-05-8	tertiaryAmylmethylether	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
127-18-4	Tetrachloroethylene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
109-99-9	Tetrahydrofuran	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
108-88-3	Toluene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
10061-02-6	trans-1,3-Dichloropropylene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	1	10/02/15	B5J0207	8260	
79-01-6	Trichloroethylene	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-69-4	Trichlorofluoromethane	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
75-01-4	Vinyl chloride	ND	1.0	ug/L	1	10/02/15	B5J0207	8260	
Surrogate: Bromofluorobenzene			*100 %*	*85-115*		*10/02/15*	B5J0207	*8260*	
Surrogate: Dibromofluoromethane			*103 %*	*82.7-115*		*10/02/15*	B5J0207	*8260*	
Surrogate: Toluene-d8			*99.6 %*	*85-115*		*10/02/15*	B5J0207	*8260*	

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Client ID: TMW-02 (13'-14') DUP

Lab ID: 1510021-07

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Methane									
74-84-0	Ethane	ND	0.10	mg/L	1	10/05/15	B5J0505	8015	
74-85-1	Ethylene	ND	0.010	mg/L	1	10/05/15	B5J0505	8015	
74-82-8	**Methane**	**0.015**	0.010	mg/L	1	10/05/15	B5J0505	8015	
Organics-Semivolatiles									
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
88-06-2	2,4,6-Trichlorophenol	ND	4.0	ug/L	1	10/08/15	B5J0502	8270	
120-83-2	2,4-Dichlorophenol	ND	10	ug/L	1	10/08/15	B5J0502	8270	
105-67-9	2,4-Dimethylphenol	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
51-28-5	2,4-Dinitrophenol	ND	25	ug/L	1	10/08/15	B5J0502	8270	
121-14-2	2,4-Dinitrotoluene	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
606-20-2	2,6-Dinitrotoluene	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
95-51-2	2-Chloroaniline	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
91-58-7	2-Chloronaphthalene	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	
95-57-8	2-Chlorophenol	ND	10	ug/L	1	10/08/15	B5J0502	8270	
4-52-1	2-Methyl-4,6-dinitrophenol	ND	20	ug/L	1	10/08/15	B5J0502	8270	
1-57-6	2-Methylnaphthalene	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
95-48-7	2-Methylphenol (o-Cresol)	ND	10	ug/L	1	10/08/15	B5J0502	8270	
88-74-4	2-Nitroaniline	ND	20	ug/L	1	10/08/15	B5J0502	8270	
88-75-5	2-Nitrophenol	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
108394,106445	3 & 4-Methylphenol	ND	20	ug/L	1	10/08/15	B5J0502	8270	
99-09-2	3-Nitroaniline	ND	20	ug/L	1	10/08/15	B5J0502	8270	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	
59-50-7	4-Chloro-3-methyl-phenol	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
106-47-8	4-Chloroaniline	ND	10	ug/L	1	10/08/15	B5J0502	8270	
7005-72-3	4-Chlorodiphenylether	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
100-01-6	4-Nitroaniline	ND	20	ug/L	1	10/08/15	B5J0502	8270	
100-02-7	4-Nitrophenol	ND	25	ug/L	1	10/08/15	B5J0502	8270	
83-32-9	Acenaphthene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
208-96-8	Acenaphthylene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
62-53-3	Aniline	ND	4.0	ug/L	1	10/08/15	B5J0502	8270	
120-12-7	Anthracene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
103-33-3	Azobenzene	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	
56-55-3	Benz[a]anthracene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
50-32-8	Benzo[a]pyrene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
205-99-2	Benzo[b]fluoranthene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
191-24-2	Benzo[g,h,i]perylene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
207-08-9	Benzo[k]fluoranthene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
100-51-6	Benzyl Alcohol	ND	50	ug/L	1	10/08/15	B5J0502	8270	
1-91-1	Bis(2-chloroethoxy)methane	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	

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Client ID: TMW-02 (13'-14') DUP

Lab ID: 1510021-07

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Semivolatiles									
111-44-4	Bis(2-chloroethyl)ether	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
108-60-1	Bis(2-chloroisopropyl)ether	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
117-81-7	Bis(2-ethylhexyl)phthalate	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
85-68-7	Butyl benzyl phthalate	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
86-74-8	Carbazole	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
218-01-9	Chrysene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
53-70-3	Dibenz[a,h]anthracene	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	
132-64-9	Dibenzofuran	ND	4.0	ug/L	1	10/08/15	B5J0502	8270	
84-66-2	Diethylphthalate	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
131-11-3	Dimethyl phthalate	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
84-74-2	Di-n-butyl phthalate	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
117-84-0	Di-n-octyl phthalate	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
206-44-0	Fluoranthene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
86-73-7	Fluorene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
118-74-1	Hexachlorobenzene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
87-68-3	Hexachlorobutadiene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
77-47-4	Hexachlorocyclopentadiene	ND	10	ug/L	1	10/08/15	B5J0502	8270	
67-72-1	Hexachloroethane	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
193-39-5	Indeno(1,2,3-c,d)pyrene	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	
78-59-1	Isophorone	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
121-69-7	N,N-dimethylaniline	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
91-20-3	Naphthalene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
98-95-3	Nitrobenzene	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	
100-61-8	N-methylaniline	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
67-75-9	N-Nitrosodimethylamine	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
621-64-7	N-Nitrosodi-n-propylamine	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	
86-30-6	N-Nitrosodiphenylamine	ND	2.0	ug/L	1	10/08/15	B5J0502	8270	
87-86-5	Pentachlorophenol	ND	20	ug/L	1	10/08/15	B5J0502	8270	
85-01-8	Phenanthrene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
108-95-2	Phenol	ND	5.0	ug/L	1	10/08/15	B5J0502	8270	
129-00-0	Pyrene	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
110-86-1	Pyridine	ND	20	ug/L	1	10/08/15	B5J0502	8270	
632-22-4	Tetramethylurea	ND	1.0	ug/L	1	10/08/15	B5J0502	8270	
Surrogate: 2,4,6-Tribromophenol			*71.6 %*	*33.8-115*		*10/08/15*	B5J0502	*8270*	
Surrogate: 2-Fluorobiphenyl			*41.5 %*	*24.1-115*		*10/08/15*	B5J0502	*8270*	
Surrogate: 2-Fluorophenol			*18.1 %*	*10-115*		*10/08/15*	B5J0502	*8270*	
Surrogate: Nitrobenzene-d5			*40.8 %*	*17.8-115*		*10/08/15*	B5J0502	*8270*	
Surrogate: Phenol-d6			*10.9 %*	*10-115*		*10/08/15*	B5J0502	*8270*	
Surrogate: p-Terphenyl-d14			*66.1 %*	*41.8-115*		*10/08/15*	B5J0502	*8270*	

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Client ID: TMW-02 (13'-14') DUP

Lab ID: 1510021-07

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Pesticides									
789-02-6	2,4'-DDT	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
72-54-8	4,4'-DDD	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
72-55-9	4,4'-DDE	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
50-29-3	4,4'-DDT	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
319-84-6	a-BHC	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
5103-71-9	a-Chlordane	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
309-00-2	Aldrin	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
319-85-7	b-BHC	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
319-86-8	d-BHC	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
60-57-1	Dieldrin	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
959-98-8	Endosulfan I	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
33213-65-9	Endosulfan II	ND	0.030	ug/L	1	10/08/15	B5I3014	8081/8082	
1031-07-8	Endosulfan sulfate	ND	0.050	ug/L	1	10/08/15	B5I3014	8081/8082	
72-20-8	Endrin	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
7421-93-4	Endrin aldehyde	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	A08
53494-70-5	Endrin ketone	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
58-89-9	g-BHC (Lindane)	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
5103-74-2	g-Chlordane	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
76-44-8	Heptachlor	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
1024-57-3	Heptachlor epoxide	ND	0.010	ug/L	1	10/08/15	B5I3014	8081/8082	
87-82-1	Hexabromobenzene	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
72-43-5	Methoxychlor	ND	0.050	ug/L	1	10/08/15	B5I3014	8081/8082	
2385-85-5	Mirex	ND	0.020	ug/L	1	10/08/15	B5I3014	8081/8082	
59080-40-9	PBB (BP-6)	ND	0.050	ug/L	1	10/08/15	B5I3014	8081/8082	
8001-35-2	Toxaphene	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
Surrogate: Decachlorobiphenyl			*61.9 %*	*30-150*		*10/08/15*	B5I3014	*8081/8082*	
Surrogate: Tetrachloro-m-xylene			*48.5 %*	*30-150*		*10/08/15*	B5I3014	*8081/8082*	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: TMW-02 (13'-14') DUP

Lab ID: 1510021-07

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-PCBs as Aroclors									
12674-11-2	Aroclor 1016	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11104-28-2	Aroclor 1221	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11141-16-5	Aroclor 1232	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
53469-21-9	Aroclor 1242	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
12672-29-6	Aroclor 1248	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11097-69-1	Aroclor 1254	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11096-82-5	Aroclor 1260	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
37324-23-5	Aroclor 1262	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
11100-14-4	Aroclor 1268	ND	0.10	ug/L	1	10/08/15	B5I3014	8081/8082	
Surrogate: Decachlorobiphenyl			*63.2 %*	*30-150*		*10/08/15*	B5I3014	*8081/8082*	
Surrogate: Tetrachloro-m-xylene			*49.2 %*	*30-150*		*10/08/15*	B5I3014	*8081/8082*	
Inorganics-General Chemistry									
57-12-5	Total Cyanide	ND	0.005	mg/L	1	10/02/15	B5J0209	ASTM D7511-09	
Inorganics-Metals									
7440-36-0	Antimony	ND	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-38-2	**Arsenic**	**6.1**	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-39-3	**Barium**	**310**	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-41-7	Beryllium	ND	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-43-9	Cadmium	ND	0.2	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-47-3	**Chromium**	**2.6**	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-48-4	Cobalt	ND	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-50-8	**Copper**	**3.3**	1.0	ug/L	1	10/14/15	B5J0602	6020/200.8	
7439-89-6	**Iron**	**7600**	20	ug/L	1	10/16/15	B5J0602	6010/200.7	
7439-92-1	**Lead**	**2.0**	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7439-96-5	**Manganese**	**230**	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7439-97-6	Mercury	ND	0.2	ug/L	1	10/15/15	B5J1405	7470/245.1	
7439-98-7	Molybdenum	ND	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-02-0	**Nickel**	**17**	2.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7782-49-2	Selenium	ND	1.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-22-4	Silver	ND	0.2	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-28-0	Thallium	ND	2.0	ug/L	1	10/14/15	B5J0602	6020/200.8	
7440-62-2	**Vanadium**	**5.3**	2.0	ug/L	1	10/13/15	B5J0602	6020/200.8	
7440-66-6	**Zinc**	**17**	5.0	ug/L	1	10/13/15	B5J0602	6020/200.8	

DEQ

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

Lab Work Order Number	Project Name	Matrix
1510021	Tree Farm	WATER

Site Code/Project Number: MIB000000196	AY: 16	CC Email 1: DUCSAYTC@MI.GOV	Project TAT Days:	Sample Collector: Teresa Ducsay	
Dept-Division-District: MDEQ/ARD	Index: 44092	CC Email 2:	Project Due Date:	Sample Collector Phone: 517-284-5088	
State Project Manager: Teresa Ducsay	PCA: 30701	CC Email 3:		Contract Firm:	
State Project Manager Email: DUCSAYTC@MI.GOV	Project: 128 457052	Overflow Lab Choice 1: Trimatrix	Accept Analysis hold time codes	Contract Firm Primary Contact:	
State Project Manager Phone: 517-284-5088	Phase: 19	Overflow Lab Choice 2:		Primary Contact Phone:	

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments	Field Cond	Field D.O.	Field pH	Field Secchi	Field Temp
1		TMW-02 (13-14')	10-1-15	1325	10						
2		TMW-06 (20-21')	9-30-15	1315	1						
3		TMW-07 (17-18')	10-1-15	1500	1						
4		TMW-08 (19-20')	9-30-15	1345	1						
5		TMW-09 (12-13')	10-1-15	1730	1						
6		TMW-10 (6.5-7.5')	10-1-15	1640	10						
7		TMW-02 (13-14') DUP	10-1-15	1325	10						
8											
9											
10											

ORGANIC CHEMISTRY

VOA - Volatile Organic Acidic	
Volatiles - Full List	(1) 2 3 4 5 (6) (7) 8 9 10
BTEX/MTBE/TMB only	1 2 3 4 5 6 7 8 9 10
Chlorinated only	1 2 3 4 5 6 7 8 9 10
GRO	1 2 3 4 5 6 7 8 9 10
1,4 Dioxane	1 2 3 4 5 6 7 8 9 10
METH - Methane, Ethane, Ethene	
Methane, Ethane, Ethene	1 2 3 4 5 6 7 8 9 10
ON - Pesticides, PCBs	
Pesticides & PCBs	(1) 2 3 4 5 (6) (7) 8 9 10
Pesticides only	1 2 3 4 5 6 7 8 9 10
PCBs only	1 2 3 4 5 6 7 8 9 10
Toxaphene	1 2 3 4 5 6 7 8 9 10
Chlordane	1 2 3 4 5 6 7 8 9 10
BNA - Base Neutral Acids	
BNAs	(1) 2 3 4 5 (6) (7) 8 9 10
Benzidines	1 2 3 4 5 6 7 8 9 10
PNAs only	1 2 3 4 5 6 7 8 9 10
BNs only	1 2 3 4 5 6 7 8 9 10
Acids only	1 2 3 4 5 6 7 8 9 10
Organic Specialty Requests	
Library search - Volatiles	1 2 3 4 5 6 7 8 9 10
Library search - SemiVols	1 2 3 4 5 6 7 8 9 10
Finger Print	1 2 3 4 5 6 7 8 9 10
DRO / ORO	1 2 3 4 5 6 7 8 9 10

METALS CHEMISTRY PACKAGES

OpMemo2 - Total	(1) 2 3 4 5 (6) (7) 8 9 10
OpMemo2 - Dissolved	1 2 3 4 5 6 7 8 9 10
(Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)	
Michigan10 - Total	1 2 3 4 5 6 7 8 9 10
Michigan10 - Dissolved	1 2 3 4 5 6 7 8 9 10
(As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)	

MAD - DISSOLVED METALS

Diss - Silver - Ag	1 2 3 4 5 6 7 8 9 10
Diss - Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Diss - Arsenic - As	1 2 3 4 5 6 7 8 9 10
Diss - Boron - B	1 2 3 4 5 6 7 8 9 10
Diss - Barium - Ba	1 2 3 4 5 6 7 8 9 10
Diss - Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Diss - Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Diss - Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Diss - Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Diss - Copper - Cu	1 2 3 4 5 6 7 8 9 10
Diss - Iron - Fe	1 2 3 4 5 6 7 8 9 10
Diss - Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Diss - Lithium - Li	1 2 3 4 5 6 7 8 9 10
Diss - Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Diss - Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Diss - Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Diss - Lead - Pb	1 2 3 4 5 6 7 8 9 10
Diss - Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Diss - Selenium - Se	1 2 3 4 5 6 7 8 9 10
Diss - Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Diss - Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Diss - Thallium - Tl	1 2 3 4 5 6 7 8 9 10
Diss - Uranium - U	1 2 3 4 5 6 7 8 9 10
Diss - Vanadium - V	1 2 3 4 5 6 7 8 9 10
Diss - Zinc - Zn	1 2 3 4 5 6 7 8 9 10
Diss - Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Diss - Potassium - K	1 2 3 4 5 6 7 8 9 10
Diss - Magnesium - Mg	1 2 3 4 5 6 7 8 9 10
Diss - Sodium - Na	1 2 3 4 5 6 7 8 9 10
Diss - Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10
MD - Metals Dissolved	
Lab Filtration	1 2 3 4 5 6 7 8 9 10

MA - TOTAL METALS

Silver - Ag	1 2 3 4 5 6 7 8 9 10
Aluminum - Al	1 2 3 4 5 6 7 8 9 10
Arsenic - As	1 2 3 4 5 6 7 8 9 10
Boron - B	1 2 3 4 5 6 7 8 9 10
Barium - Ba	1 2 3 4 5 6 7 8 9 10
Beryllium - Be	1 2 3 4 5 6 7 8 9 10
Cadmium - Cd	1 2 3 4 5 6 7 8 9 10
Cobalt - Co	1 2 3 4 5 6 7 8 9 10
Chromium - Cr	1 2 3 4 5 6 7 8 9 10
Copper - Cu	1 2 3 4 5 6 7 8 9 10
Iron - Fe	1 2 3 4 5 6 7 8 9 10
Mercury - Hg	1 2 3 4 5 6 7 8 9 10
Lithium - Li	1 2 3 4 5 6 7 8 9 10
Manganese - Mn	1 2 3 4 5 6 7 8 9 10
Molybdenum - Mo	1 2 3 4 5 6 7 8 9 10
Nickel - Ni	1 2 3 4 5 6 7 8 9 10
Lead - Pb	1 2 3 4 5 6 7 8 9 10
Antimony - Sb	1 2 3 4 5 6 7 8 9 10
Selenium - Se	1 2 3 4 5 6 7 8 9 10
Strontium - Sr	1 2 3 4 5 6 7 8 9 10
Titanium - Ti	1 2 3 4 5 6 7 8 9 10
Thallium - Tl	1 2 3 4 5 6 7 8 9 10
Uranium - U	1 2 3 4 5 6 7 8 9 10
Vanadium - V	1 2 3 4 5 6 7 8 9 10
Zinc - Zn	1 2 3 4 5 6 7 8 9 10
Calcium - Ca	1 2 3 4 5 6 7 8 9 10
Potassium - K	1 2 3 4 5 6 7 8 9 10
Magnesium - Mg	1 2 3 4 5 6 7 8 9 10
Sodium - Na	1 2 3 4 5 6 7 8 9 10
Hardness - Ca, Mg	1 2 3 4 5 6 7 8 9 10
LHG - Low Level Mercury	
Mercury Low Level - Hg	1 2 3 4 5 6 7 8 9 10

GENERAL CHEMISTRY

GB Total Cyanide - CN	(1) 2 3 4 5 (6) (7) 8 9 10
GB Amenable Cyanide - CN	1 2 3 4 5 6 7 8 9 10
GCN Available Cyanide - CN	1 2 3 4 5 6 7 8 9 10
CA Chlorophyll	1 2 3 4 5 6 7 8 9 10
GN Ortho Phosphate - OP	1 2 3 4 5 6 7 8 9 10
GN Nitrite - NO_2	1 2 3 4 5 6 7 8 9 10
GN Nitrate - NO_3 (Calc.)	1 2 3 4 5 6 7 8 9 10
GN Suspended Solids - SS	1 2 3 4 5 6 7 8 9 10
GN Dissolved Solids - TDS	1 2 3 4 5 6 7 8 9 10
MN Diss Solids - TDS (Calc.)	1 2 3 4 5 6 7 8 9 10
GN Turbidity	1 2 3 4 5 6 7 8 9 10
MN Total Alkalinity	1 2 3 4 5 6 7 8 9 10
MN Bicarb/Carb Alkalinity (Includes Total Alkalinity)	1 2 3 4 5 6 7 8 9 10
MN Chloride - Cl	1 2 3 4 5 6 7 8 9 10
MN Fluoride - F	1 2 3 4 5 6 7 8 9 10
MN Sulfate - SO4	1 2 3 4 5 6 7 8 9 10
MN Chromium 6 - Cr+6	1 2 3 4 5 6 7 8 9 10
MN Conductivity	1 2 3 4 5 6 7 8 9 10
MN pH	1 2 3 4 5 6 7 8 9 10
GA Chem Oxyg Dem - COD	1 2 3 4 5 6 7 8 9 10
GA Diss Org Carbon - DOC (FF) (Field - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
GN Diss Org Carbon - DOC (LF) (Lab - Filtered & Preserved)	1 2 3 4 5 6 7 8 9 10
GA Total Org Carbon - TOC	1 2 3 4 5 6 7 8 9 10
GA Ammonia - NH3	1 2 3 4 5 6 7 8 9 10
GA Nitrate+Nitrite - NO3+NO2	1 2 3 4 5 6 7 8 9 10
GA Kjeldahl Nitrogen - KN	1 2 3 4 5 6 7 8 9 10
GA Total Phosphorus - TP	1 2 3 4 5 6 7 8 9 10

Chain of Custody

	Relinquished by	Received By	Date / Time
Print Name & Org.	Teresa Ducsay, MDEQ	Kirby Shane DEQ	10/2/15 0903
Signature:	Teresa Ducsay		
Print Name & Org.			
Signature:			
Print Name & Org.			
Signature:			

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

14 October 2015

Work Order: 1510022

Price: $630.00

Teresa Ducsay
MDEQ-RRD-LANSING
525 W. Allegan Street
Lansing, MI 48909

RE: TREE FARM

I certify that the analyses performed by the MDEQ Environmental Laboratory were conducted by methods approved by the U.S. Environmental Protection Agency and other appropriate regulatory agencies.

Sincerely,

George Krisztian
Laboratory Director

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

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TEL: (517) 335-9800
FAX: (517) 335-9600

MDEQ-RRD-LANSING	Project: TREE FARM	
525 W. Allegan Street	Site Code: MIB000000196	**Reported:**
Lansing MI, 48909	Project Manager: Teresa Ducsay	10/14/2015

Analytical Report for Samples

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received	Qualifier
SGP-02	1510022-01	Air	10/01/2015	10/02/2015	
TMW-02 (13'-14')	1510022-02	Air	10/01/2015	10/02/2015	
SGP-07	1510022-03	Air	10/01/2015	10/02/2015	
TMW-07 (17'-18')	1510022-04	Air	10/01/2015	10/02/2015	
SGP-09	1510022-05	Air	10/01/2015	10/02/2015	
TMW-09 (12'-13')	1510022-06	Air	10/01/2015	10/02/2015	
SGP-10	1510022-07	Air	10/01/2015	10/02/2015	

Notes and Definitions

ND	Indicates compound analyzed for but not detected
RL	Reporting Limit
NA	Not Applicable

STATE OF MICHIGAN
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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: SGP-02

Lab ID: 1510022-01

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Methane									
74-84-0	Ethane	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-85-1	Ethylene	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-82-8	**Methane**	**150**	20	ppmv	1	10/06/15	B5J0613	8015	

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Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: TMW-02 (13'-14')

Lab ID: 1510022-02

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Methane									
74-84-0	Ethane	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-85-1	Ethylene	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-82-8	Methane	ND	20	ppmv	1	10/06/15	B5J0613	8015	

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TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: SGP-07

Lab ID: 1510022-03

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Methane									
74-84-0	Ethane	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-85-1	Ethylene	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-82-8	Methane	ND	20	ppmv	1	10/06/15	B5J0613	8015	

STATE OF MICHIGAN
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MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
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P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: TMW-09 (12'-13')

Lab ID: 1510022-06

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Methane									
74-84-0	Ethane	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-85-1	Ethylene	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-82-8	**Methane**	**7800**	20	ppmv	1	10/06/15	B5J0613	8015	

STATE OF MICHIGAN
DEPARTMENT OF ENVIRONMENTAL QUALITY

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
ENVIRONMENTAL LABORATORY

P.O. Box 30270
Lansing, MI 48909
TEL: (517) 335-9800
FAX: (517) 335-9600

Client ID: SGP-10

Lab ID: 1510022-07

CAS #	Analyte	Result	RL	Units	Dilution	Analyzed Date	QC Batch	Method	Qualifier
Organics-Methane									
74-84-0	Ethane	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-85-1	Ethylene	ND	20	ppmv	1	10/06/15	B5J0613	8015	
74-82-8	**Methane**	**210000**	20	ppmv	1	10/06/15	B5J0613	8015	

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

Lab Work Order Number	Project Name	Matrix
1510022	Tree Farm	AIR

Site Code/Project Number: MIB000000196	AY: 16	CC Email 1: DUCSAYT@MI.gov	Project TAT Days:	Sample Collector: Teresa Ducsay	
Dept-Division-District: MDEQ/RRD	Index: 44097	CC Email 2:	Project Due Date:	Sample Collector Phone: 517-284-5088	
State Project Manager: Teresa Ducsay	PCA: 30701	CC Email 3:		Contract Firm:	
State Project Manager Email: DUCSAYT@MI.gov	Project: 128 457052	Overflow Lab Choice 1:	Accept Analysis hold time codes	Contract Firm Primary Contact:	
State Project Manager Phone: 517-284-5088	Phase: 19	Overflow Lab Choice 2:		Primary Contact Phone:	

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments	Regulator ID	Canister/Bottle Vac Number
1	01	SGP-02	10/1/15	1115	1			
2	02	TMW-02 (13'-14')		1145	1	Water in Sample		
3	03	SGP-07		0920	1			
4	04	TMW-07 (17'-18')		0940	1			
5	05	SGP-09		1020	1	~~In TMW-09 time 1040~~		
6	06	TMW-09 (12'-13')		1040	1	time 1020		
7	07	SGP-10		1010	1			
8								
9								
10								

ORGANIC CHEMISTRY

VOA - Volatile Organic Analysis

Bottlevac	~~1 2 3 4 5 6 7~~ 8 9 10
Canister - AQD	~~1 2 3 4 5 6 7~~ 8 9 10
Canister - RRD	1 2 3 4 5 6 7 8 9 10
Tedlar - Volatiles	1 2 3 4 5 6 7 8 9 10

METH - Methane, Ethane, Ethene

Methane, Ethane, Ethene	1 2 3 4 5 6 7 8 9 10

for Teresa Ducsay (cs)

Chain of Custody

Relinquished by	Received By	Date / Time
Print Name & Org.: Teresa Ducsay; MDEQ Signature: Teresa Ducsay	Melissa Smith CCL	10/2/15 915
Print Name & Org.: Signature:		
Print Name & Org.: Signature:		

APPENDIX C

APPENDIX C

PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS

TABLE 1. GROUNDWATER: RESIDENTIAL AND NON-RESIDENTIAL
PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per liter (ug/L). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based or solubility value, whichever is lower.

Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Acenaphthene	83329	1,300	3,800	38	4,200 (S)	4,200 (S)	4,240	ID
Acenaphthylene	208968	52	150	ID	3,900 (S)	3,900 (S)	3,930	ID
Acetaldehyde (I)	75070	950	2,700	130	1.10E+06	2.30E+06	1.00E+09	8.90E+06
Acetate	71501	4,200	12,000	(G)	ID	ID	ID	ID
Acetic acid	64197	4,200	12,000	(G)	NLV	NLV	6.00E+09	1.0E+9 (D)
Acetone (I)	67641	730	2,100	1,700	1.0E+9 (D,S)	1.0E+9 (D,S)	1.00E+09	1.50E+07
Acetonitrile	75058	140	400	NA	2.40E+07	4.50E+07	2.00E+08	2.10E+07
Acetophenone	98862	1,500	4,400	ID	6.1E+6 (S)	6.1E+6 (S)	6.10E+06	ID
Acrolein (I)	107028	120	330	NA	2,100	4,200	2.10E+08	6.70E+06
Acrylamide	79061	0.5 (A)	0.5 (A)	10 (X)	NLV	NLV	2.20E+09	NA
Acrylic acid	79107	3,900	11,000	NA	1.20E+07	2.80E+07	1.00E+09	1.0E+9 (D)
Acrylonitrile (I)	107131	2.6	11	2.0 (M); 1.2	34,000	1.90E+05	7.50E+07	6.40E+06
Alachlor	15972608	2.0 (A)	2.0 (A)	11 (X)	NLV	NLV	1.83E+05	ID
Aldicarb	116063	3.0 (A)	3.0 (A)	NA	NLV	NLV	6.00E+06	ID
Aldicarb sulfone	1646884	2.0 (A)	2.0 (A)	NA	NLV	NLV	7.80E+06	ID
Aldicarb sulfoxide	1646873	4.0 (A)	4.0 (A)	NA	NLV	NLV	2.80E+07	ID
Aldrin	309002	0.098	0.4	0.01 (M); 8.7E-6	180 (S)	180 (S)	180	ID
Aluminum (B)	7429905	50 (V)	50 (V)	NA	NLV	NLV	NA	ID
Ammonia	7664417	10,000 (N)	10,000 (N)	(CC)	3.20E+06	7.10E+06	5.30E+08	ID
t-Amyl methyl ether (TAME)	994058	190 (E)	190 (E)	NA	2.60E+05	5.70E+05	2.64E+06	NA
Aniline	62533	53	220	4	NLV	NLV	3.60E+07	NA
Anthracene	120127	43 (S)	43 (S)	ID	43 (S)	43 (S)	43.4	ID
Antimony	7440360	6.0 (A)	6.0 (A)	130 (X)	NLV	NLV	NA	ID
Arsenic	7440382	10 (A)	10 (A)	10	NLV	NLV	NA	ID
Asbestos (BB)	1332214	7.0E MFL (A)	7.0E MFL (A)	NA	NLV	NLV	NA	NA
Atrazine	1912249	3.0 (A)	3.0 (A)	7.3	NLV	NLV	70,000	ID
Azobenzene	103333	23	94	ID	6,400 (S)	6,400 (S)	6,400	ID
Barium (B)	7440393	2,000 (A)	2,000 (A)	(G)	NLV	NLV	NA	ID

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Benzene (I)	71432	5.0 (A)	5.0 (A)	200 (X)	5,600	35,000	1.75E+06	68,000
Benzidine	92875	0.3 (M); 0.0037	0.3 (M); 0.015	0.3 (M); 0.073	NLV	NLV	5.20E+05	ID
Benzo(a)anthracene (Q)	56553	2.1	8.5	ID	NLV	NLV	9.4	ID
Benzo(b)fluoranthene (Q)	205992	1.5 (S,AA)	1.5 (S,AA)	ID	ID	ID	1.5	ID
Benzo(k)fluoranthene (Q)	207089	1.0 (M); 0.8 (S)	1.0 (M); 0.8 (S)	NA	NLV	NLV	0.8	ID
Benzo(g,h,i)perylene	191242	1.0 (M); 0.26 (S)	1.0 (M); 0.26 (S)	ID	NLV	NLV	0.26	ID
Benzo(a)pyrene (Q)	50328	5.0 (A)	5.0 (A)	ID	NLV	NLV	1.62	ID
Benzoic acid	65850	32,000	92,000	NA	NLV	NLV	3.50E+06	ID
Benzyl alcohol	100516	10,000	29,000	NA	NLV	NLV	4.40E+07	ID
Benzyl chloride	100447	7.7	32	NA	12,000	77,000	4.90E+05	NA
Beryllium	7440417	4.0 (A)	4.0 (A)	(G)	NLV	NLV	NA	ID
bis(2-Chloroethoxy)ethane	112265	ID	ID	ID	NLV	NLV	1.89E+07	ID
bis(2-Chloroethyl)ether (I)	111444	2	8.3	1.0 (M); 0.79	38,000	2.10E+05	1.72E+07	1.7E+7 (S)
bis(2-Ethylhexyl)phthalate	117817	6.0 (A)	6.0 (A)	25	NLV	NLV	340	NA
Boron (B)	7440428	500 (F)	500 (F)	7,200 (X)	NLV	NLV	NA	ID
Bromate	15541454	10 (A)	10 (A)	40 (X)	NLV	NLV	38,000	ID
Bromobenzene (I)	108861	18	50	NA	1.80E+05	3.90E+05	4.13E+05	ID
Bromodichloromethane	75274	80 (A,W)	80 (A,W)	ID	4,800	37,000	6.74E+06	ID
Bromoform	75252	80 (A,W)	80 (A,W)	ID	4.70E+05	3.1E+6 (S)	3.10E+06	ID
Bromomethane	74839	10	29	35	4,000	9,000	1.45E+07	ID
n-Butanol (I)	71363	950	2,700	9,800 (X)	NLV	NLV	7.40E+07	4.70E+07
2-Butanone (MEK) (I)	78933	13,000	38,000	2,200	2.4E+8 (S)	2.4E+8 (S)	2.40E+08	ID
n-Butyl acetate	123864	550	1,600	NA	6.7E+6 (S)	6.7E+6 (S)	6.70E+06	2.50E+06
t-Butyl alcohol	75650	3,900	11,000	NA	1.0E+9 (D,S)	1.0E+9 (D,S)	1.00E+09	6.10E+07
Butyl benzyl phthalate	85687	1,200	2,700 (S)	67 (X)	NLV	NLV	2,690	ID
n-Butylbenzene	104518	80	230	ID	ID	ID	NA	ID
sec-Butylbenzene	135988	80	230	ID	ID	ID	NA	ID
t-Butylbenzene (I)	98066	80	230	ID	ID	ID	NA	ID

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Cadmium (B)	7440439	5.0 (A)	5.0 (A)	(G,X)	NLV	NLV	NA	ID
Camphene (I)	79925	ID	ID	NA	440	1,000	33,400	ID
Caprolactam	105602	5,800	17,000	NA	NLV	NLV	5.25E+09	NA
Carbaryl	63252	700	2,000	NA	ID	ID	1.26E+05	ID
Carbazole	86748	85	350	10 (M); 4.0	NLV	NLV	7,480	ID
Carbofuran	1563662	40 (A)	40 (A)	NA	NLV	NLV	7.00E+05	ID
Carbon disulfide (I,R)	75150	800	2,300	ID	2.50E+05	5.50E+05	1.19E+06	13,000
Carbon tetrachloride	56235	5.0 (A)	5.0 (A)	45 (X)	370	2,400	7.93E+05	ID
Chlordane (J)	57749	2.0 (A)	2.0 (A)	2.0 (M); 0.00025	56 (S)	56 (S)	56	ID
Chloride	16887006	2.5E+5 (E)	2.5E+5 (E)	(FF)	NLV	NLV	NA	ID
Chlorobenzene (I)	108907	100 (A)	100 (A)	25	2.10E+05	4.7E+5 (S)	4.72E+05	1.60E+05
p-Chlorobenzene sulfonic acid	98668	7,300	21,000	ID	ID	ID	NA	ID
1-Chloro-1,1-difluoroethane	75683	15,000	44,000	NA	3.9E+6 (S)	3.9E+6 (S)	3.90E+06	NA
Chloroethane	75003	430	1,700	1,100 (X)	5.7E+6 (S)	5.7E+6 (S)	5.74E+06	1.10E+05
2-Chloroethyl vinyl ether	110758	ID	ID	NA	ID	ID	1.50E+07	ID
Chloroform	67663	80 (A,W)	80 (A,W)	350	28,000	1.80E+05	7.92E+06	ID
Chloromethane (I)	74873	260	1,100	ID	8,600	45,000	6.34E+06	36,000
4-Chloro-3-methylphenol	59507	150	420	7.4	NLV	NLV	3.90E+06	ID
beta-Chloronaphthalene	91587	1,800	5,200	NA	ID	ID	6,740	ID
2-Chlorophenol	95578	45	130	18	4.90E+05	1.10E+06	2.20E+07	ID
o-Chlorotoluene (I)	95498	150	420	ID	2.20E+05	3.7E+5 (S)	3.73E+05	ID
Chlorpyrifos	2921882	22	63	2.0 (M); 0.002	2.9	6.6	1,120	ID
Chromium (III) (B,H)	16065831	100 (A)	100 (A)	(G,X)	NLV	NLV	NA	ID
Chromium (VI)	18540299	100 (A)	100 (A)	11	NLV	NLV	NA	ID
Chrysene (Q)	218019	1.6 (S)	1.6 (S)	ID	ID	ID	1.6	ID
Cobalt	7440484	40	100	100	NLV	NLV	NA	ID
Copper (B)	7440508	1,000 (E)	1,000 (E)	(G)	NLV	NLV	NA	ID
Cyanazine	21725462	2.3	9.4	56 (X)	NLV	NLV	1.70E+05	ID

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Cyanide (P,R)	57125	200 (A)	200 (A)	5.2	NLV	NLV	NA	ID
Cyclohexanone	108941	33,000	94,000	NA	1,500	3,300	2.30E+07	NA
Dacthal	1861321	73	210	NA	NLV	NLV	500	ID
Dalapon	75990	200 (A)	200 (A)	NA	NLV	NLV	5.02E+08	ID
4-4'-DDD	72548	9.1	37	NA	NLV	NLV	90	ID
4-4'-DDE	72559	4.3	15	NA	NLV	NLV	120	ID
4-4'-DDT	50293	3.6	10	0.02 (M); 1.1E-5	NLV	NLV	25	NA
Decabromodiphenyl ether	1163195	30 (S)	30 (S)	NA	30 (S)	30 (S)	30	ID
Di-n-butyl phthalate	84742	880	2,500	9.7	NLV	NLV	11,200	NA
Di(2-ethylhexyl) adipate	103231	400 (A)	400 (A)	ID	NLV	NLV	471	ID
Di-n-octyl phthalate	117840	130	380	ID	NLV	NLV	3,000	ID
Diacetone alcohol (I)	123422	ID	ID	NA	NLV	NLV	1.00E+09	1.0E+9 (S)
Diazinon	333415	1.3	3.8	1.0 (M); 0.004	NLV	NLV	68,800	NA
Dibenzo(a,h)anthracene (Q)	53703	2.0 (M); 0.21	2.0 (M); 0.85	ID	NLV	NLV	2.49	ID
Dibenzofuran	132649	ID	ID	4	10,000 (S)	10,000 (S)	10,000	ID
Dibromochloromethane	124481	80 (A,W)	80 (A,W)	ID	14,000	1.10E+05	2.60E+06	ID
Dibromochloropropane	96128	0.2 (A)	0.2 (A)	ID	220	1,200 (S)	1,230	NA
Dibromomethane	74953	80	230	NA	ID	ID	1.10E+07	ID
Dicamba	1918009	220	630	NA	NLV	NLV	4.50E+06	ID
1,2-Dichlorobenzene	95501	600 (A)	600 (A)	13	1.6E+5 (S)	1.6E+5 (S)	1.56E+05	NA
1,3-Dichlorobenzene	541731	6.6	19	28	18,000	41,000	1.11E+05	ID
1,4-Dichlorobenzene	106467	75 (A)	75 (A)	17	16,000	74,000 (S)	73,800	NA
3,3'-Dichlorobenzidine	91941	1.1	4.3	0.3 (M); 0.2	NLV	NLV	3,110	ID
Dichlorodifluoromethane	75718	1,700	4,800	ID	2.20E+05	3.0E+5 (S)	3.00E+05	ID
1,1-Dichloroethane	75343	880	2,500	740	1.00E+06	2.30E+06	5.06E+06	3.80E+05
1,2-Dichloroethane (I)	107062	5.0 (A)	5.0 (A)	360 (X)	9,600	59,000	8.52E+06	2.50E+06
1,1-Dichloroethylene (I)	75354	7.0 (A)	7.0 (A)	130	200	1,300	2.25E+06	97,000
cis-1,2-Dichloroethylene	156592	70 (A)	70 (A)	620	93,000	2.10E+05	3.50E+06	5.30E+05

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trans-1,2-Dichloroethylene	156605	100 (A)	100 (A)	1,500 (X)	85,000	2.00E+05	6.30E+06	2.30E+05
2,6-Dichloro-4-nitroaniline	99309	2,200	6,300	NA	NLV	NLV	7,000	ID
2,4-Dichlorophenol	120832	73	210	11	NLV	NLV	4.50E+06	ID
2,4-Dichlorophenoxyacetic acid	94757	70 (A)	70 (A)	220	NLV	NLV	6.80E+05	ID
1,2-Dichloropropane (I)	78875	5.0 (A)	5.0 (A)	230 (X)	16,000	36,000	2.80E+06	5.50E+05
1,3-Dichloropropene	542756	8.5	35	9.0 (X)	3,900	26,000	2.80E+06	1.30E+05
Dichlorovos	62737	1.6	6.7	NA	NLV	NLV	1.60E+07	NA
Dicyclohexyl phthalate	84617	ID	ID	NA	ID	ID	4,000	ID
Dieldrin	60571	0.11	0.43	0.02 (M); 6.5E-6	200 (S)	200 (S)	195	ID
Diethyl ether	60297	10 (E)	10 (E)	ID	6.1E+7 (S)	6.1E+7 (S)	6.10E+07	6.50E+05
Diethyl phthalate	84662	5,500	16,000	110	NLV	NLV	1.08E+06	NA
Diethylene glycol monobutyl ether	112345	88	250	NA	NLV	NLV	1.00E+09	ID
Diisopropyl ether	108203	30	86	ID	8,000 (S)	8,000 (S)	8,041	8,000 (S)
Diisopropylamine (I)	108189	5.6	16	NA	2.10E+07	3.7E+7 (S)	3.69E+07	4.60E+06
Dimethyl phthalate	131113	73,000	2.10E+05	NA	NLV	NLV	4.19E+06	NA
N,N-Dimethylacetamide	127195	180	520	4,100 (X)	NLV	NLV	1.00E+09	NA
N,N-Dimethylaniline	121697	16	46	NA	2.40E+05	1.3E+6 (S)	1.27E+06	NA
Dimethylformamide (I)	68122	700	2,000	NA	NLV	NLV	1.00E+09	ID
2,4-Dimethylphenol	105679	370	1,000	380	NLV	NLV	7.87E+06	ID
2,6-Dimethylphenol	576261	4.4	13	NA	NLV	NLV	6.14E+06	ID
3,4-Dimethylphenol	95658	10	29	25	NLV	NLV	4.93E+06	ID
Dimethylsulfoxide	67685	2.20E+05	6.30E+05	1.90E+05	NLV	NLV	1.66E+08	ID
2,4-Dinitrotoluene	121142	7.7	32	NA	NLV	NLV	2.70E+05	ID
Dinoseb	88857	7.0 (A)	7.0 (A)	1.0 (M); 0.48	NLV	NLV	52,000	ID
1,4-Dioxane (I)	123911	85	350	2,800 (X)	NLV	NLV	9.00E+08	1.40E+08
Diquat	85007	20 (A)	20 (A)	20 (M); 6.0	NLV	NLV	7.00E+05	ID
Dissolved oxygen (DO)	NA	ID	ID	(EE)	ID	ID	NA	NA
Diuron	330541	31	90	NA	NLV	NLV	37,300	ID

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Endosulfan (J)	115297	44	130	0.03 (M); 0.029	ID	ID	510	ID
Endothall	145733	100 (A)	100 (A)	NA	NLV	NLV	1.00E+08	ID
Endrin	72208	2.0 (A)	2.0 (A)	ID	NLV	NLV	250	ID
Epichlorohydrin (I)	106898	5.0 (M); 2.0 (A)	5.0 (M); 2.0 (A)	NA	3.20E+05	6.30E+05	6.60E+07	4.70E+07
Ethanol (I)	64175	1.90E+06	3.80E+06	ID	NLV	NLV	1.00E+09	9.70E+07
Ethyl acetate (I)	141786	6,600	19,000	NA	6.4E+7 (S)	6.4E+7 (S)	6.40E+07	4.20E+06
Ethyl-tert-butyl ether (ETBE)	637923	49 (E)	49 (E)	ID	2.90E+06	5.6E+6 (S)	5.63E+06	ID
Ethylbenzene (I)	100414	74 (E)	74 (E)	18	1.10E+05	1.7E+5 (S)	1.69E+05	43,000
Ethylene dibromide	106934	0.05 (A)	0.05 (A)	5.7 (X)	2,400	15,000	4.20E+06	ID
Ethylene glycol	107211	15,000	42,000	1.9E+5 (X)	NLV	NLV	1.00E+09	NA
Ethylene glycol monobutyl ether	111762	3,700	10,000	NA	2.90E+06	6.50E+06	2.24E+08	NA
Fluoranthene	206440	210 (S)	210 (S)	1.6	210 (S)	210 (S)	206	ID
Fluorene	86737	880	2,000 (S)	12	2,000 (S)	2,000 (S)	1,980	ID
Fluorine (soluble fluoride) (B)	7782414	2,000 (E)	2,000 (E)	ID	NLV	NLV	NA	ID
Formaldehyde	50000	1,300	3,800	120	63,000	3.60E+05	5.50E+08	ID
Formic acid (I,U)	64186	10,000	29,000	ID	7.70E+06	1.50E+07	1.00E+09	1.0E+9 (D)
1-Formylpiperidine	2591868	80	230	NA	ID	ID	NA	ID
Gentian violet	548629	15	63	NA	NLV	NLV	1.00E+06	ID
Glyphosate	1071836	700 (A)	700 (A)	NA	NLV	NLV	1.16E+07	ID
Heptachlor	76448	0.4 (A)	0.4 (A)	0.01 (M); 0.0018	180 (S)	180 (S)	180	ID
Heptachlor epoxide	1024573	0.2 (A)	0.2 (A)	ID	NLV	NLV	200	ID
n-Heptane	142825	2,700 (S)	2,700 (S)	NA	2,700 (S)	2,700 (S)	2,690	200
Hexabromobenzene	87821	0.17 (S); 20	0.17 (S); 58	ID	ID	ID	0.17	ID
Hexachlorobenzene (C-66)	118741	1.0 (A)	1.0 (A)	0.2 (M); 0.0003	440	3,000	6,200	ID
Hexachlorobutadiene (C-46)	87683	15	42	0.053	1,600	3,200 (S)	3,230	ID
alpha-Hexachlorocyclohexane	319846	0.43	1.7	ID	2,000 (S)	2,000 (S)	2,000	ID
beta-Hexachlorocyclohexane	319857	0.88	3.6	ID	NLV	NLV	240	ID
Hexachlorocyclopentadiene (C-56)	77474	50 (A)	50 (A)	ID	130	420	1,800	ID

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Hazardous Substance	Chemical Abstract Service Number	Residential Drinking Water Criteria	Nonresidential Drinking Water Criteria	Groundwater Surface Water Interface Criteria	Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Nonresidential Groundwater Volatilization to Indoor Air Inhalation Criteria	Water Solubility	Flammability and Explosivity Screening Level
Hexachloroethane	67721	7.3	21	6.7 (X)	27,000	50,000 (S)	50,000	ID
n-Hexane	110543	3,000	8,600	NA	12,000 (S)	12,000 (S)	12,000	12,000 (S)
2-Hexanone	591786	1,000	2,900	ID	4.20E+06	8.70E+06	1.60E+07	NA
Indeno(1,2,3-cd)pyrene (Q)	193395	2.0 (M); 0.022 (S)	2.0 (M); 0.022 (S)	ID	NLV	NLV	0.022	ID
Iron (B)	7439896	300 (E)	300 (E)	NA	NLV	NLV	NA	ID
Isobutyl alcohol (I)	78831	2,300	6,700	NA	7.6E+7 (S)	7.6E+7 (S)	7.60E+07	ID
Isophorone	78591	770	3,100	1,300 (X)	NLV	NLV	1.20E+07	ID
Isopropyl alcohol (I)	67630	470	1,300	57,000 (X)	NLV	NLV	1.00E+09	6.00E+07
Isopropyl benzene	98828	800	2,300	28	56,000 (S)	56,000 (S)	56,000	29,000
Lead (B)	7439921	4.0 (L)	4.0 (L)	(G,X)	NLV	NLV	NA	ID
Lindane	58899	0.2 (A)	0.2 (A)	0.03 (M); 0.026	ID	ID	6,800	ID
Lithium (B)	7439932	170	350	440	NLV	NLV	NA	ID
Magnesium (B)	7439954	4.00E+05	1.10E+06	NA	NLV	NLV	NA	ID
Manganese (B)	7439965	50 (E)	50 (E)	(G,X)	NLV	NLV	NA	ID
Mercury (Total) (B,Z)	Varies	2.0 (A)	2.0 (A)	0.0013	56 (S)	56 (S)	56	ID
Methane	74828	ID	ID	NA	(K)	(K)	NA	(AA)
Methanol	67561	3,700	10,000	5.9E+5 (X)	2.9E+7 (S)	2.9E+7 (S)	2.90E+07	4.50E+06
Methoxychlor	72435	40 (A)	40 (A)	NA	ID	ID	45	ID
2-Methoxyethanol (I)	109864	7.3	21	NA	NLV	NLV	1.00E+09	ID
2-Methyl-4-chlorophenoxyacetic acid	94746	7.3	21	NA	NLV	NLV	9.24E+05	ID
2-Methyl-4,6-dinitrophenol	534521	20 (M); 2.6	20 (M); 7.3	NA	NLV	NLV	2.00E+05	ID
N-Methyl-morpholine (I)	109024	20	56	NA	NLV	NLV	1.00E+09	ID
Methyl parathion	298000	1.8	5.2	NA	NLV	NLV	50,000	ID
4-Methyl-2-pentanone (MIBK) (I)	108101	1,800	5,200	ID	2.0E+7 (S)	2.0E+7 (S)	2.00E+07	ID
Methyl-tert-butyl ether (MTBE)	1634044	40 (E)	40 (E)	7,100 (X)	4.7E+7 (S)	4.7E+7 (S)	4.68E+07	ID
Methylcyclopentane (I)	96377	ID	ID	NA	22,000	49,000	73,890	ID
4,4'-Methylene-bis-2- chloroaniline	101144	1.1	4.5	NA	NLV	NLV	14,000	ID
Methylene chloride	75092	5.0 (A)	5.0 (A)	1,500 (X)	2.20E+05	1.40E+06	1.70E+07	ID

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2-Methylnaphthalene	91576	260	750	19	25,000 (S)	25,000 (S)	24,600	ID
Methylphenols (J)	1319773	370	1,000	30 (M); 25	NLV	NLV	2.80E+07	NA
Metolachlor	51218452	240	990	15	NLV	NLV	5.30E+05	ID
Metribuzin	21087649	180	520	NA	ID	ID	1.20E+06	ID
Mirex	2385855	0.02 (M); 6.8E-6 (S)	0.02 (M); 6.8E-6 (S)	0.02 (M); 6.8E-6 (S)	ID	ID	6.80E-06	NA
Molybdenum (B)	7439987	73	210	3,200 (X)	NLV	NLV	NA	ID
Naphthalene	91203	520	1,500	11	31,000 (S)	31,000 (S)	31,000	NA
Nickel (B)	7440020	100 (A)	100 (A)	(G)	NLV	NLV	NA	ID
Nitrate (B,N)	14797558	10,000 (A,N)	10,000 (A,N)	ID	NLV	NLV	NA	ID
Nitrite (B,N)	14797650	1,000 (A,N)	1,000 (A,N)	NA	NLV	NLV	NA	ID
Nitrobenzene (I)	98953	3.4	9.6	180 (X)	2.80E+05	5.50E+05	2.09E+06	NA
2-Nitrophenol	88755	20	58	ID	NLV	NLV	2.50E+06	ID
n-Nitroso-di-n-propylamine	621647	5.0 (M); 0.19	5.0 (M); 0.77	NA	NLV	NLV	9.89E+06	ID
N-Nitrosodiphenylamine	86306	270	1,100	NA	NLV	NLV	35,100	ID
Oxamyl	23135220	200 (A)	200 (A)	NA	NLV	NLV	2.80E+08	ID
Oxo-hexyl acetate	88230357	73	210	NA	ID	ID	NA	ID
Pendimethalin	40487421	280 (S)	280 (S)	NA	NLV	NLV	275	ID
Pentachlorobenzene	608935	6.1	17	5.0 (M); 0.019	ID	ID	650	ID
Pentachloronitrobenzene	82688	32 (S)	32 (S)	NA	32 (S)	32 (S)	32	ID
Pentachlorophenol	87865	1.0 (A)	1.0 (A)	(G,X)	NLV	NLV	1.85E+06	ID
Pentane	109660	ID	ID	NA	38,000 (S)	38,000 (S)	38,200	340
2-Pentene (I)	109682	ID	ID	NA	ID	ID	2.03E+05	ID
pH	NA	6.5 to 8.5 (E)	6.5 to 8.5 (E)	6.5 to 9.0	ID	ID	NA	NA
Phenanthrene	85018	52	150	2.0 (M); 1.4	1,000 (S)	1,000 (S)	1,000	ID
Phenol	108952	4,400	13,000	450	NLV	NLV	8.28E+07	NA
Phenytoin	57410	17	68	89 (X)	NLV	NLV	32,000	ID
Phosphorus (Total)	7723140	63,000	2.40E+05	(EE)	NLV	NLV	NA	ID
Phthalic acid	88993	14,000	40,000	NA	NLV	NLV	1.42E+07	ID

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Phthalic anhydride	85449	15,000	44,000	NA	NLV	NLV	6.20E+06	NA
Picloram	1918021	500 (A)	500 (A)	46	NLV	NLV	4.30E+05	ID
Piperidine	110894	3.2	9.2	NA	NLV	NLV	1.00E+09	ID
Polybrominated biphenyls (J)	67774327	0.03	0.09	ID	NLV	NLV	1.66E+07	ID
Polychlorinated biphenyls (PCBs) (J,T)	1336363	0.5 (A)	0.5 (A)	0.2 (M); 2.6E-5	45 (S)	45 (S)	44.7	ID
Prometon	1610180	160	460	NA	NLV	NLV	7.50E+05	ID
Propachlor	1918167	95	270	NA	NLV	NLV	6.55E+05	ID
Propazine	139402	200	560	NA	NLV	NLV	8,600	ID
Propionic acid	79094	12,000	35,000	ID	NLV	NLV	1.00E+09	1.0E+9 (D)
Propyl alcohol (I)	71238	1,400	4,000	NA	NLV	NLV	1.00E+09	7.10E+07
n-Propylbenzene (I)	103651	80	230	ID	ID	ID	NA	ID
Propylene glycol	57556	1.50E+05	4.20E+05	2.90E+05	NLV	NLV	1.00E+09	ID
Pyrene	129000	140 (S)	140 (S)	ID	140 (S)	140 (S)	135	ID
Pyridine (I)	110861	20 (M); 7.3	21	NA	5,500	12,000	3.00E+05	81,000
Selenium (B)	7782492	50 (A)	50 (A)	5	NLV	NLV	NA	ID
Silver (B)	7440224	34	98	0.2 (M); 0.06	NLV	NLV	NA	ID
Silvex (2,4,5-TP)	93721	50 (A)	50 (A)	30	NLV	NLV	1.40E+05	ID
Simazine	122349	4.0 (A)	4.0 (A)	17	NLV	NLV	4,470	ID
Sodium	17341252	2.3E+S(HH)	3.50E+05	NA	NLV	NLV	NA	ID
Sodium azide	26628228	88	250	50 (M); 7.3	ID	ID	NA	ID
Strontium (B)	7440246	4,600	13,000	21,000	NLV	NLV	NA	ID
Styrene	100425	100 (A)	100 (A)	80 (X)	1.70E+05	3.1E+5 (S)	3.10E+05	1.40E+05
Sulfate	14808798	2.5E+5 (E)	2.5E+5 (E)	NA	NLV	NLV	NA	ID
Tebuthiuron	34014181	510	1,500	NA	NLV	NLV	2.50E+06	ID
2,3,7,8-Tetrabromodibenzo-p-dioxin (O)	50585416	(O)	(O)	(O)	NLV	NLV	0.00996	ID
1,2,4,5-Tetrachlorobenzene	95943	1,300 (S)	1,300 (S)	2.9 (X)	1,300 (S)	1,300 (S)	1,300	ID
2,3,7,8-Tetrachlorodibenzo-p-dioxin (O)	1746016	3.0E-5 (A)	3.0E-5 (A)	1.0E-5 (M); 3.1E-9	NLV	NLV	0.019	ID
1,1,1,2-Tetrachloroethane	630206	77	320	ID	15,000	96,000	1.10E+06	ID

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1,1,2,2-Tetrachloroethane	79345	8.5	35	78 (X)	12,000	77,000	2.97E+06	ID
Tetrachloroethylene	127184	5.0 (A)	5.0 (A)	60 (X)	25,000	1.70E+05	2.00E+05	ID
Tetrahydrofuran	109999	95	270	11,000 (X)	6.90E+06	1.60E+07	1.00E+09	60,000
Tetranitromethane	509148	ID	ID	NA	580	3,200	85,000	ID
Thallium (B)	7440280	2.0 (A)	2.0 (A)	3.7 (X)	NLV	NLV	NA	ID
Toluene (I)	108883	790 (E)	790 (E)	270	5.3E+5 (S)	5.3E+5 (S)	5.26E+05	61,000
p-Toluidine	106490	15	62	NA	NLV	NLV	7.60E+06	NA
Total dissolved solids (TDS)	NA	5.0E+5 (E)	5.0E+5 (E)	(EE)	ID	ID	NA	NA
Toxaphene	8001352	3.0 (A)	3.0 (A)	1.0 (M); 6.8E-5	NLV	NLV	740	ID
Triallate	2303175	95	270	NA	ID	ID	4,000	ID
Tributylamine	102829	10	29	ID	14,000	32,000	75,400	ID
1,2,4-Trichlorobenzene	120821	70 (A)	70 (A)	99 (X)	3.0E+5 (S)	3.0E+5 (S)	3.00E+05	NA
1,1,1-Trichloroethane	71556	200 (A)	200 (A)	89	6.60E+05	1.3E+6 (S)	1.33E+06	ID
1,1,2-Trichloroethane	79005	5.0 (A)	5.0 (A)	330 (X)	17,000	1.10E+05	4.42E+06	NA
Trichloroethylene	79016	5.0 (A)	5.0 (A)	200 (X)	2,200	4,900	1.10E+06	ID
Trichlorofluoromethane	75694	2,600	7,300	NA	1.1E+6 (S)	1.1E+6 (S)	1.10E+06	ID
2,4,5-Trichlorophenol	95954	730	2,100	NA	NLV	NLV	1.20E+06	ID
2,4,6-Trichlorophenol	88062	120	470	5	NLV	NLV	8.00E+05	ID
1,2,3-Trichloropropane	96184	42	120	NA	8,300	18,000	1.90E+06	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	1.7E+5 (S)	1.7E+5 (S)	32	1.7E+5 (S)	1.7E+5 (S)	1.70E+05	ID
Triethanolamine	102716	3,700	10,000	NA	NLV	NLV	1.00E+09	ID
Triethylene glycol	112276	4,300	12,000	NA	NLV	NLV	1.00E+06	ID
3-Trifluoromethyl-4-nitrophenol	88302	4,500	13,000	NA	NLV	NLV	5.00E+06	ID
Trifluralin	1582098	37	110	NA	ID	ID	8,100	ID
2,2,4-Trimethyl pentane	540841	ID	ID	NA	2,300 (S)	2,300 (S)	2,330	160
2,4,4-Trimethyl-2-pentene (I)	107404	ID	ID	NA	ID	ID	11,900	ID
1,2,4-Trimethylbenzene (I)	95636	63 (E)	63 (E)	17	56,000 (S)	56,000 (S)	55,890	56,000 (S)
1,3,5-Trimethylbenzene (I)	108678	72 (E)	72 (E)	45	61,000 (S)	61,000 (S)	61,150	ID

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Triphenyl phosphate	115866	1,200	1,400 (S)	NA	NLV	NLV	1,430	ID
tris(2,3-Dibromopropyl)phosphate	126727	10 (M); 0.71	10 (M); 2.9	ID	4,700 (S)	4,700 (S)	4,700	ID
Urea	57136	ID	ID	NA	NLV	NLV	NA	ID
Vanadium	7440622	4.5	62	27	NLV	NLV	NA	ID
Vinyl acetate (I)	108054	640	1,800	NA	4.10E+06	8.90E+06	2.00E+07	1.80E+06
Vinyl chloride	75014	2.0 (A)	2.0 (A)	13 (X)	1,100	13,000	2.76E+06	33,000
White phosphorus (R)	12185103	0.11	0.31	NA	NLV	NLV	NA	ID
Xylenes (I)	1330207	280 (E)	280 (E)	41	1.9E+5 (S)	1.9E+5 (S)	1.86E+05	70,000
Zinc (B)	7440666	2,400	5,000 (E)	(G)	NLV	NLV	NA	ID

TABLE 2. SOIL: RESIDENTIAL
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			Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Acenaphthene	83329	NA	3.00E+05	8,700	1.90E+08	8.10E+07	8.10E+07	8.10E+07	1.40E+10	4.10E+07	NA
Acenaphthylene	208968	NA	5,900	ID	1.60E+06	2.20E+06	2.20E+06	2.20E+06	2.30E+09	1.60E+06	NA
Acetaldehyde (I)	75070	NA	19,000	2,600	2.20E+05	1.70E+05	1.70E+05	2.80E+05	6.00E+08	2.90E+07	1.10E+08
Acetate	71501	NA	ID	(G)	ID	ID	ID	ID	ID	ID	ID
Acetic acid	64197	NA	84,000	(G)	NLV	NLV	NLV	NLV	1.70E+10	1.30E+08	6.50E+08
Acetone (I)	67641	NA	15,000	34,000	2.9E+8 (C)	1.30E+08	1.30E+08	1.90E+08	3.90E+11	2.30E+07	1.10E+08
Acetonitrile	75058	NA	2,800	NA	4.80E+06	1.60E+06	1.60E+06	2.10E+06	4.00E+09	4.30E+06	2.20E+07
Acetophenone	98862	NA	30,000	ID	1.2E+8 (C)	4.40E+07	4.40E+07	4.40E+07	3.30E+10	4.7E+7 (C)	1.10E+06
Acrolein (I)	107028	NA	2,400	NA	410	310	310	610	1.30E+06	3.60E+06	2.30E+07
Acrylamide	79061	NA	10	200 (X)	NLV	NLV	NLV	NLV	2.40E+06	1,900	NA
Acrylic acid	79107	NA	78,000	NA	2.40E+06	1.90E+05	2.30E+05	2.30E+05	6.70E+07	3.5E+7 (DD)	1.10E+08
Acrylonitrile (I)	107131	NA	100 (M); 52	100 (M); 40	6,600	5,000	5,100	10,000	4.60E+07	16,000	8.30E+06
Alachlor	15972608	NA	52	290 (X)	NLV	NLV	NLV	NLV	ID	93,000	NA
Aldicarb	116063	NA	60	NA	NLV	NLV	NLV	NLV	ID	2.30E+05	NA
Aldicarb sulfone	1646884	NA	200 (M); 40	NA	NLV	NLV	NLV	NLV	ID	2.50E+05	NA
Aldicarb sulfoxide	1646873	NA	200(M); 80	NA	NLV	NLV	NLV	NLV	ID	2.90E+05	NA
Aldrin	309002	NA	NLL	NLL	1.30E+06	58,000	58,000	58,000	6.40E+05	1,000	NA
Aluminum (B)	7429905	6.90E+06	1,000	NA	NLV	NLV	NLV	NLV	ID	5.0E+7 (DD)	NA
Ammonia	7664417	NA	ID	(CC)	ID	ID	ID	ID	6.70E+09	ID	1.00E+07
t-Amyl methyl ether (TAME)	994058	NA	3,900	NA	58,000	3.40E+05	7.60E+05	1.80E+06	4.10E+09	2.9E+7 (C)	4.40E+05
Aniline	62533	NA	1,100	330 (M); 80	NLV	NLV	NLV	NLV	6.70E+07	3.30E+05	4.50E+06
Anthracene	120127	NA	41,000	ID	1.0E+9 (D)	1.40E+09	1.40E+09	1.40E+09	6.70E+10	2.30E+08	NA
Antimony	7440360	NA	4,300	94,000 (X)	NLV	NLV	NLV	NLV	1.30E+07	1.80E+05	NA
Arsenic	7440382	5,800	4,600	4,600	NLV	NLV	NLV	NLV	7.20E+05	7,600	NA
Asbestos (BB)	1332214	NA	NLL	NLL	NLV	NLV	NLV	NLV	1.0E+7 (M); 68,000	ID	NA
Atrazine	1912249	NA	60	150	NLV	NLV	NLV	NLV	ID	71,000 (DD)	NA
Azobenzene	103333	NA	4,200	ID	6.10E+06	6.30E+05	6.30E+05	6.30E+05	1.00E+08	1.40E+05	NA

TABLE 2. SOIL: RESIDENTIAL

PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

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			Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Barium (B)	7440393	75,000	1.30E+06	(G)	NLV	NLV	NLV	NLV	3.30E+08	3.70E+07	NA
Benzene (I)	71432	NA	100	4,000 (X)	1,600	13,000	34,000	79,000	3.80E+08	1.80E+05	4.00E+05
Benzidine	92875	NA	1,000 (M); 6.0	1,000 (M); 6.0	NLV	NLV	NLV	NLV	46,000	1,000 (M); 23	NA
Benzo(a)anthracene (Q)	56553	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	20,000	NA
Benzo(b)fluoranthene (Q)	205992	NA	NLL	NLL	ID	ID	ID	ID	ID	20,000	NA
Benzo(k)fluoranthene (Q)	207089	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	2.00E+05	NA
Benzo(g;h,i)perylene	191242	NA	NLL	NLL	NLV	NLV	NLV	NLV	8.00E+08	2.50E+06	NA
Benzo(a)pyrene (Q)	50328	NA	NLL	NLL	NLV	NLV	NLV	NLV	1.50E+06	2,000	NA
Benzoic acid	65850	NA	6.40E+05	NA	NLV	NLV	NLV	NLV	ID	9.90E+08	NA
Benzyl alcohol	100516	NA	2.00E+05	NA	NLV	NLV	NLV	NLV	3.30E+11	3.2E+8 (C)	5.80E+06
Benzyl chloride	100447	NA	150	NA	6,300	14,000	14,000	17,000	6.20E+07	48,000	2.30E+05
Beryllium	7440417	NA	51,000	(G)	NLV	NLV	NLV	NLV	1.30E+06	4.10E+05	NA
bis(2-Chloroethoxy)ethane	112265	NA	ID	ID	NLV	NLV	NLV	NLV	ID	ID	2.70E+06
bis(2-Chloroethyl)ether (I)	111444	NA	100	100 (M); 20	8,300	3,800	3,800	3,800	9.40E+06	13,000	2.20E+06
bis(2-Ethylhexyl)phthalate	117817	NA	NLL	NLL	NLV	NLV	NLV	NLV	7.00E+08	2.80E+06	1.00E+07
Boron (B)	7440428	NA	10,000	1.4E+5 (X)	NLV	NLV	NLV	NLV	ID	4.8E+7 (DD)	NA
Bromate	15541454	NA	200	800 (X)	NLV	NLV	NLV	NLV	ID	17,000	NA
Bromobenzene (I)	108861	NA	550	NA	3.10E+05	4.50E+05	4.50E+05	4.50E+05	5.30E+08	5.40E+05	7.60E+05
Bromodichloromethane	75274	NA	1,600 (W)	ID	1,200	9,100	9,700	19,000	8.40E+07	1.10E+05	1.50E+06
Bromoform	75252	NA	1,600 (W)	ID	1.50E+05	9.00E+05	9.00E+05	9.00E+05	2.80E+09	8.20E+05	8.70E+05
Bromomethane	74839	NA	200	700	860	11,000	57,000	1.40E+05	3.30E+08	3.20E+05	2.20E+06
n-Butanol (I)	71363	NA	19,000	2.00E+05	NLV	NLV	NLV	NLV	2.30E+10	2.9E+7 (C)	8.70E+06
2-Butanone (MEK) (I)	78933	NA	2.60E+05	44,000	5.4E+7 (C)	2.90E+07	2.90E+07	3.50E+07	6.70E+10	1.2E+8 (C, DD)	2.70E+07
n-Butyl acetate	123864	NA	11,000	NA	5.6E+7 (C)	1.10E+08	2.60E+08	3.20E+08	4.70E+11	1.7E+7 (C)	1.10E+06
t-Butyl alcohol	75650	NA	78,000	NA	3.1E+8 (C)	9.70E+07	2.00E+08	2.00E+08	1.30E+11	1.2E+8 (C)	1.10E+08
Butyl benzyl phthalate	85687	NA	2.2E+6 (C)	1.2E+5 (X)	NLV	NLV	NLV	NLV	4.70E+10	3.6E+7 (C)	3.10E+05
n-Butylbenzene	104518	NA	1,600	ID	ID	ID	ID	ID	2.00E+09	2.50E+06	1.00E+07

TABLE 2. SOIL: RESIDENTIAL

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sec-Butylbenzene	135988	NA	1,600	ID	ID	ID	ID	ID	4.00E+08	2.50E+06	1.00E+07
t-Butylbenzene (I)	98066	NA	1,600	ID	ID	ID	ID	ID	6.70E+08	2.50E+06	1.00E+07
Cadmium (B)	7440439	1,200	6,000	(G,X)	NLV	NLV	NLV	NLV	1.70E+06	5.50E+05	NA
Camphene (I)	79925	NA	ID	NA	3,700	1.50E+05	9.10E+05	2.20E+06	5.30E+09	ID	NA
Caprolactam	105602	NA	1.20E+05	NA	NLV	NLV	NLV	NLV	6.70E+08	5.3E+7 (DD)	NA
Carbaryl	63252	NA	14,000	NA	ID	ID	ID	ID	ID	2.20E+07	NA
Carbazole	86748	NA	9,400	1,100	NLV	NLV	NLV	NLV	6.20E+07	5.30E+05	NA
Carbofuran	1563662	NA	800	NA	NLV	NLV	NLV	NLV	ID	1.10E+06	NA
Carbon disulfide (I,R)	75150	NA	16,000	ID	76,000	1.30E+06	7.90E+06	1.90E+07	4.70E+10	7.2E+6 (C, DD)	2.80E+05
Carbon tetrachloride	56235	NA	100	900 (X)	190	3,500	12,000	28,000	1.30E+08	96,000	3.90E+05
Chlordane (J)	57749	NA	NLL	NLL	1.10E+07	1.20E+06	1.20E+06	1.20E+06	3.10E+07	31,000	NA
Chloride	16887006	NA	5.00E+06	(X)	NLV	NLV	NLV	NLV	ID	5.0E+5 (F)	NA
Chlorobenzene (I)	108907	NA	2,000	500	1.20E+05	7.70E+05	9.90E+05	2.10E+06	4.70E+09	4.3E+6 (C)	2.60E+05
p-Chlorobenzene sulfonic acid	98668	NA	1.50E+05	ID	ID	ID	ID	ID	ID	2.30E+08	ID
1-Chloro-1,1-difluoroethane	75683	NA	3.00E+05	NA	2.9E+6 (C)	7.90E+07	5.60E+08	1.40E+09	3.30E+12	4.7E+8 (C)	9.60E+05
Chloroethane	75003	NA	8,600	22,000 (X)	2.9E+6 (C)	3.00E+07	1.20E+08	2.80E+08	6.70E+11	2.6E+6 (C)	9.50E+05
2-Chloroethyl vinyl ether	110758	NA	ID	NA	ID	ID	ID	ID	ID	ID	1.90E+06
Chloroform	67663	NA	1,600 (W)	7,000	7,200	45,000	1.20E+05	2.70E+05	1.30E+09	1.20E+06	1.50E+06
Chloromethane (I)	74873	NA	5,200	ID	2,300	40,000	4.10E+05	1.00E+06	4.90E+09	1.6E+6 (C)	1.10E+06
4-Chloro-3-methylphenol	59507	NA	5,800	280	NLV	NLV	NLV	NLV	ID	4.50E+06	NA
beta-Chloronaphthalene	91587	NA	6.20E+05	NA	ID	ID	ID	ID	ID	5.60E+07	NA
2-Chlorophenol	95578	NA	900	360	4.30E+05	9.60E+05	9.60E+05	9.60E+05	1.20E+09	1.40E+06	1.90E+07
o-Chlorotoluene (I)	95498	NA	3,300	ID	2.70E+05	1.20E+06	2.90E+06	6.30E+06	4.70E+09	4.5E+6 (C)	5.00E+05
Chlorpyrifos	2921882	NA	17,000	1,500	130	4,600	23,000	55,000	1.30E+08	1.10E+07	NA
Chromium (III) (B,H)	16065831	18,000 (total)	1.0E+9 (D)	(G,X)	NLV	NLV	NLV	NLV	3.30E+08	7.90E+08	NA
Chromium (VI)	18540299	NA	30,000	3,300	NLV	NLV	NLV	NLV	2.60E+05	2.50E+06	NA
Chrysene (Q)	218019	NA	NLL	NLL	ID	ID	ID	ID	ID	2.00E+06	NA

TABLE 2. SOIL: RESIDENTIAL
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Cobalt	7440484	6,800	800	2,000	NLV	NLV	NLV	NLV	1.30E+07	2.60E+06	NA
Copper (B)	7440508	32,000	5.80E+06	(G)	NLV	NLV	NLV	NLV	1.30E+08	2.00E+07	NA
Cyanazine	21725462	NA	200	1,100 (X)	NLV	NLV	NLV	NLV	ID	14,000	NA
Cyanide (P,R)	57125	390 (total)	4,000	100	NLV	NLV	NLV	NLV	2.50E+05	12,000	NA
Cyclohexanone	108941	NA	5.20E+06	NA	17,000	1.00E+06	1.10E+07	2.70E+07	6.70E+10	1.0E+9 (C,D)	2.20E+08
Dacthal	1861321	NA	50,000	NA	NLV	NLV	NLV	NLV	ID	2.30E+06	NA
Dalapon	75990	NA	4,000	NA	NLV	NLV	NLV	NLV	ID	1.90E+07	5.90E+07
4-4'-DDD	72548	NA	NLL	NLL	NLV	NLV	NLV	NLV	4.40E+07	95,000	NA
4-4'-DDE	72559	NA	NLL	NLL	NLV	NLV	NLV	NLV	3.20E+07	45,000	NA
4-4'-DDT	50293	NA	NLL	NLL	NLV	NLV	NLV	NLV	3.20E+07	57,000	NA
Decabromodiphenyl ether	1163195	NA	1.40E+05	NA	1.0E+9 (D)	8.60E+07	8.60E+07	8.60E+07	2.30E+09	3.80E+06	NA
Di-n-butyl phthalate	84742	NA	9.6E+5 (C)	11,000	NLV	NLV	NLV	NLV	3.30E+09	2.7E+7 (C)	7.60E+05
Di(2-ethylhexyl) adipate	103231	NA	1.3E+7 (C)	ID	NLV	NLV	NLV	NLV	9.20E+09	1.5E+7 (C, DD)	9.60E+05
Di-n-octyl phthalate	117840	NA	1.00E+08	ID	NLV	NLV	NLV	NLV	3.10E+10	6.90E+06	1.40E+08
Diacetone alcohol (I)	123422	NA	ID	NA	NLV	NLV	NLV	NLV	1.60E+11	ID	1.10E+08
Diazinon	333415	NA	95	72	NLV	NLV	NLV	NLV	ID	12,000 (DD)	3.10E+05
Dibenzo(a,h)anthracene (Q)	53703	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	2,000	NA
Dibenzofuran	132649	NA	ID	1,700	2.00E+06	1.30E+05	1.30E+05	1.30E+05	6.70E+06	ID	NA
Dibromochloromethane	124481	NA	1,600 (W)	ID	3,900	24,000	24,000	33,000	1.30E+08	1.10E+05	6.10E+05
Dibromochloropropane	96128	NA	10 (M); 4.0	ID	220	260	260	260	5.60E+05	4,400 (C)	1,200
Dibromomethane	74953	NA	1,600	NA	ID	ID	ID	ID	ID	2.5E+6 (C)	2.00E+06
Dicamba	1918009	NA	4,400	NA	NA	NLV	NLV	NLV	ID	3.40E+06	NA
1,2-Dichlorobenzene	95501	NA	14,000	280	1.1E+7 (C)	3.90E+07	3.90E+07	5.20E+07	1.00E+11	1.9E+7 (C)	2.10E+05
1,3-Dichlorobenzene	541731	NA	170	680	26,000	79,000	79,000	1.10E+05	2.00E+08	2.0E+5 (C)	1.70E+05
1,4-Dichlorobenzene	106467	NA	1,700	360	19,000	77,000	77,000	1.10E+05	4.50E+08	4.00E+05	NA
3,3'-Dichlorobenzidine	91941	NA	2,000 (M); 28	2,000 (M); 7.4	NLV	NLV	NLV	NLV	6.50E+06	6,600	NA
Dichlorodifluoromethane	75718	NA	95,000	ID	9.00E+05	5.30E+07	5.50E+08	1.40E+09	3.30E+12	5.2E+7 (C)	1.00E+06

TABLE 2. SOIL: RESIDENTIAL

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1,1-Dichloroethane	75343	NA	18,000	15,000	2.30E+05	2.10E+06	5.90E+06	1.40E+07	3.30E+10	2.7E+7 (C)	8.90E+05
1,2-Dichloroethane (I)	107062	NA	100	7,200 (X)	2,100	6,200	11,000	26,000	1.20E+08	91,000	1.20E+06
1,1-Dichloroethylene (I)	75354	NA	140	2,600	62	1,100	5,300	13,000	6.20E+07	2.00E+05	5.70E+05
cis-1,2-Dichloroethylene	156592	NA	1,400	12,000	22,000	1.80E+05	4.20E+05	9.90E+05	2.30E+09	2.5E+6 (C)	6.40E+05
trans-1,2-Dichloroethylene	156605	NA	2,000	30,000 (X)	23,000	2.80E+05	8.30E+05	2.00E+06	4.70E+09	3.8E+6 (C)	1.40E+06
2,6-Dichloro-4-nitroaniline	99309	NA	44,000	NA	NLV	NLV	NLV	NLV	ID	6.80E+07	NA
2,4-Dichlorophenol	120832	NA	1,500	330 (M); 220	NLV	NLV	NLV	NLV	5.10E+09	6.6E+5 (DD)	1.80E+06
2,4-Dichlorophenoxy acetic acid	94757	NA	1,400	4,400	NLV	NLV	NLV	NLV	6.70E+09	2.50E+06	NA
1,2-Dichloropropane (I)	78875	NA	100	4,600 (X)	4,000	25,000	50,000	1.10E+05	2.70E+08	1.40E+05	5.50E+05
1,3-Dichloropropene	542756	NA	170	180 (X)	1,000	18,000	68,000	1.60E+05	7.80E+08	10,000	6.20E+05
Dichlorovos	62737	NA	50 (M); 32	NA	NLV	NLV	NLV	NLV	3.30E+07	10,000	2.20E+06
Dicyclohexyl phthalate	84617	NA	ID	NA	ID	ID	ID	ID	ID	ID	NA
Dieldrin	60571	NA	NLL	NLL	1.40E+05	19,000	19,000	19,000	6.80E+05	1,100	NA
Diethyl ether	60297	NA	200	ID	2.8E+7 (C)	8.50E+07	1.50E+08	3.40E+08	8.00E+11	1.1E+8 (C)	7.40E+06
Diethyl phthalate	84662	NA	1.10E+05	2,200	NLV	NLV	NLV	NLV	3.30E+09	1.7E+8 (C)	7.40E+05
Diethylene glycol monobutyl ether	112345	NA	1,800	NA	NLV	NLV	NLV	NLV	1.30E+09	2.70E+06	1.10E+08
Diisopropyl ether	108203	NA	600	ID	6.7E+5 (C)	3.40E+05	7.60E+05	1.80E+06	4.10E+09	9.2E+5 (C)	1,300
Diisopropylamine (I)	108189	NA	110	NA	5.50E+06	6.20E+06	6.20E+06	7.30E+06	1.30E+10	1.70E+05	6.70E+06
Dimethyl phthalate	131113	NA	1.5E+6 (C)	NA	NLV	NLV	NLV	NLV	3.30E+09	1.0E+9 (C,D)	7.90E+05
N,N-Dimethylacetamide	127195	NA	3,600	82,000 (X)	NLV	NLV	NLV	NLV	ID	5.60E+06	1.10E+08
N,N-Dimethylaniline	121697	NA	320	NA	1.70E+05	1.50E+05	1.50E+05	1.50E+05	2.60E+08	5.00E+05	8.00E+05
Dimethylformamide (I)	68122	NA	14,000	NA	NLV	NLV	NLV	NLV	2.00E+09	2.20E+07	1.10E+08
2,4-Dimethylphenol	105679	NA	7,400	7,600	NLV	NLV	NLV	NLV	4.70E+09	1.10E+07	NA
2,6-Dimethylphenol	576261	NA	330 (M); 88	NA	NLV	NLV	NLV	NLV	1.30E+08	1.40E+05	NA
3,4-Dimethylphenol	95658	NA	330 (M); 200	500	NLV	NLV	NLV	NLV	2.30E+08	3.20E+05	NA
Dimethylsulfoxide	67685	NA	4.40E+06	3.80E+06	NLV	NLV	NLV	NLV	1.30E+09	1.0E+9 (C,D)	1.80E+07
2,4-Dinitrotoluene	121142	NA	430	NA	NLV	NLV	NLV	NLV	1.60E+07	48,000	NA

DEQ

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Dinoseb	88857	NA	300	200 (M); 43	NLV	NLV	NLV	NLV	2.70E+08	66,000 (DD)	1.40E+05
1,4-Dioxane (I)	123911	NA	1,700	56,000 (X)	NLV	NLV	NLV	NLV	5.70E+08	5.30E+05	9.70E+07
Diquat	85007	NA	400	400	NLV	NLV	NLV	NLV	ID	5.00E+05	NA
Diuron	330541	NA	620	NA	NLV	NLV	NLV	NLV	4.70E+08	9.70E+05	NA
Endosulfan (J)	115297	NA	NLL	NLL	ID	ID	ID	ID	ID	1.40E+06	NA
Endothall	145733	NA	NLL	NLL	NLV	NLV	NLV	NLV	2.30E+09	3.80E+06	NA
Endrin	72208	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	65,000	NA
Epichlorohydrin (I)	106898	NA	100	NA	64,000	31,000	31,000	35,000	6.70E+07	8,900	7.30E+06
Ethanol (I)	64175	NA	3.80E+07	ID	NLV	NLV	NLV	NLV	1.30E+12	1.0E+9 (C,D,DD)	1.10E+08
Ethyl acetate (I)	141786	NA	1.30E+05	NA	3.8E+7 (C)	4.90E+07	4.90E+07	9.80E+07	2.10E+11	2.0E+8 (C)	7.50E+06
Ethyl-tert-butyl ether (ETBE)	637923	NA	980	ID	5.40E+05	1.90E+06	4.50E+06	1.10E+07	2.50E+10	ID	6.50E+05
Ethylbenzene (I)	100414	NA	1,500	360	87,000	7.20E+05	1.00E+06	2.20E+06	1.00E+10	2.2E+7 (C)	1.40E+05
Ethylene dibromide	106934	NA	20 (M); 1.0	110 (X)	670	1,700	1,700	3,300	1.40E+07	92	8.90E+05
Ethylene glycol	107211	NA	3.00E+05	3.8E+6 (X)	NLV	NLV	NLV	NLV	6.70E+10	4.5E+8 (C)	1.10E+08
Ethylene glycol monobutyl ether	111762	NA	74,000	NA	7.40E+05	1.80E+07	1.50E+08	3.60E+08	8.70E+11	1.1E+8 (C)	4.10E+07
Fluoranthene	206440	NA	7.30E+05	5,500	1.0E+9 (D)	7.40E+08	7.40E+08	7.40E+08	9.30E+09	4.60E+07	NA
Fluorene	86737	NA	3.90E+05	5,300	5.80E+08	1.30E+08	1.30E+08	1.30E+08	9.30E+09	2.70E+07	NA
Fluorine (soluble fluoride) (B)	7782414	NA	40,000	ID	NLV	NLV	NLV	NLV	ID	9.0E+6 (DD)	NA
Formaldehyde	50000	NA	26,000	2,400	12,000	13,000	23,000	52,000	2.40E+08	4.10E+07	6.00E+07
Formic acid (I,U)	64186	NA	2.00E+05	ID	1.50E+06	2.10E+05	1.40E+05	1.40E+05	1.30E+08	3.2E+8 (C)	1.10E+08
1-Formylpiperidine	2591868	NA	1,600	NA	ID	ID	ID	ID	ID	2.50E+06	1.00E+07
Gentian violet	548629	NA	300	NA	NLV	NLV	NLV	NLV	ID	96,000	NA
Glyphosate	1071836	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	1.1E+7 (DD)	NA
Heptachlor	76448	NA	NLL	NLL	3.50E+05	62,000	62,000	62,000	2.40E+06	5,600	NA
Heptachlor epoxide	1024573	NA	NLL	NLL	NLV	NLV	NLV	NLV	1.20E+06	3,100	NA
n-Heptane	142825	NA	4.6E+7 (C)	NA	1.5E+6 (C)	2.10E+07	4.40E+07	1.00E+08	2.30E+11	9.9E+8 (C)	2.40E+05
Hexabromobenzene	87821	NA	5,400	ID	ID	ID	ID	ID	ID	1.10E+06	NA

TABLE 2. SOIL: RESIDENTIAL

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Hexachlorobenzene (C-66)	118741	NA	1,800	350	41,000	17,000	17,000	17,000	6.80E+06	8,900	NA
Hexachlorobutadiene (C-46)	87683	NA	26,000	91	1.30E+05	1.30E+05	1.30E+05	1.30E+05	1.40E+08	1.00E+05	3.50E+05
alpha-Hexachlorocyclohexane	319846	NA	18	ID	30,000	12,000	22,000	25,000	1.70E+06	2,600	NA
beta-Hexachlorocyclohexane	319857	NA	37	ID	NLV	NLV	NLV	NLV	5.90E+06	5,400	NA
Hexachlorocyclopentadiene (C-56)	77474	NA	3.20E+05	ID	30,000	50,000	50,000	50,000	1.30E+07	2.3E+6 (C)	7.20E+05
Hexachloroethane	67721	NA	430	1,800 (X)	40,000	5.50E+05	9.30E+05	9.30E+05	2.30E+08	2.30E+05	NA
n-Hexane	110543	NA	1.8E+5 (C)	NA	5.1E+5 (C)	3.00E+06	3.20E+06	6.20E+06	1.30E+10	9.2E+7 (C)	44,000
2-Hexanone	591786	NA	20,000	ID	9.90E+05	1.10E+06	1.10E+06	1.40E+06	2.70E+09	3.2E+7 (C)	2.50E+06
Indeno(1,2,3-cd) pyrene (Q)	193395	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	20,000	NA
Iron (B)	7439896	1.20E+07	6,000	NA	NLV	NLV	NLV	NLV	ID	1.60E+08	NA
Isobutyl alcohol (I)	78831	NA	46,000	NA	2.3E+8 (C)	7.90E+07	7.90E+07	7.90E+07	1.00E+11	7.2E+7 (C)	8.90E+06
Isophorone	78591	NA	15,000	26,000 (X)	NLV	NLV	NLV	NLV	1.20E+10	4.8E+6 (C)	2.40E+06
Isopropyl alcohol (I)	67630	NA	9,400	1.1E+6 (X)	NLV	NLV	NLV	NLV	1.50E+10	1.40E+07	1.10E+08
Isopropyl benzene	98828	NA	91,000	3,200	4.0E+5 (C)	1.70E+06	1.70E+06	2.80E+06	5.80E+09	2.5E+7 (C)	3.90E+05
Lead (B)	7439921	21,000	7.00E+05	(G,X)	NLV	NLV	NLV	NLV	1.00E+08	4.00E+05	NA
Lindane	58899	NA	20 (M); 7.0	20 (M); 1.1	ID	ID	ID	ID	ID	8,300	NA
Lithium (B)	7439932	9,800	3,400	8,800	NLV	NLV	NLV	NLV	2.30E+09	4.2E+6 (DD)	NA
Magnesium (B)	7439954	NA	8.00E+06	NA	NLV	NLV	NLV	NLV	6.70E+09	1.0E+9 (D)	NA
Manganese (B)	7439965	4.40E+05	1,000	(G,X)	NLV	NLV	NLV	NLV	3.30E+06	2.50E+07	NA
Mercury (Total) (B,Z)	Varies	130	1,700	50 (M); 1.2	48,000	52,000	52,000	52,000	2.00E+07	1.60E+05	NA
Methane	74828	NA	ID	NA	8.4E+6 ug/m3 (GG)	ID	ID	ID	ID	ID	ID
Methanol	67561	NA	74,000	1.2E+7 (C)	3.7E+7 (C)	3.10E+07	4.40E+07	9.60E+07	2.20E+11	1.1E+8 (C)	3.10E+06
Methoxychlor	72435	NA	16,000	NA	ID	ID	ID	ID	ID	1.90E+06	NA
2-Methoxyethanol (I)	109864	NA	150	NA	NLV	NLV	NLV	NLV	1.30E+09	2.30E+05	1.10E+08
2-Methyl-4-chlorophenoxyacetic acid	94746	NA	390	NA	NLV	NLV	NLV	NLV	ID	2.30E+05	NA
2-Methyl-4,6-dinitrophenol	534521	NA	830 (M); 400	NA	NLV	NLV	NLV	NLV	1.30E+08	79,000	NA
N-Methyl-morpholine (I)	109024	NA	400	NA	NLV	NLV	NLV	NLV	ID	6.10E+05	1.10E+08

TABLE 2. SOIL: RESIDENTIAL

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Methyl parathion	298000	NA	46	NA	NLV	NLV	NLV	NLV	ID	56,000	NA
4-Methyl-2-pentanone (MIBK) (I)	108101	NA	36,000	ID	3.7E+7 (C)	4.50E+07	4.50E+07	6.70E+07	1.40E+11	5.6E+7 (C)	2.70E+06
Methyl-tert-butyl ether (MTBE)	1634044	NA	800	1.4E+5 (X)	9.9E+6 (C)	2.50E+07	3.90E+07	8.70E+07	2.00E+11	1.50E+06	5.90E+06
Methylcyclopentane (I)	96377	NA	ID	NA	92,000	2.30E+06	8.20E+06	2.00E+07	4.70E+10	ID	3.50E+05
4,4'-Methylene-bis-2-chloroaniline (MBOCA)	101144	NA	NLL	NLL	NLV	NLV	NLV	NLV	8.40E+07	6,800	NA
Methylene chloride	75092	NA	100	30,000 (X)	45,000	2.10E+05	5.90E+05	1.40E+06	6.60E+09	1.30E+06	2.30E+06
2-Methylnaphthalene	91576	NA	57,000	4,200	2.70E+06	1.50E+06	1.50E+06	1.50E+06	6.70E+08	8.10E+06	NA
Methylphenols (J)	1319773	NA	7,400	1,000 (M); 600	NLV	NLV	NLV	NLV	6.70E+09	1.10E+07	NA
Metolachlor	51218452	NA	4,800	300	NLV	NLV	NLV	NLV	ID	1.5E+6 (C, DD)	4.40E+05
Metribuzin	21087649	NA	3,600	NA	ID	ID	ID	ID	ID	9.60E+06	NA
Mirex	2385855	NA	NLL	NLL	ID	ID	ID	ID	ID	9,600	NA
Molybdenum (B)	7439987	NA	1,500	64,000 (X)	NLV	NLV	NLV	NLV	ID	2.60E+06	NA
Naphthalene	91203	NA	35,000	730	2.50E+05	3.00E+05	3.00E+05	3.00E+05	2.00E+08	1.60E+07	NA
Nickel (B)	7440020	20,000	1.00E+05	(G)	NLV	NLV	NLV	NLV	1.30E+07	4.00E+07	NA
Nitrate (B,N)	14797558	NA	2.0E+5 (N)	ID	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrite (B,N)	14797650	NA	20,000 (N)	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrobenzene (I)	98953	NA	330 (M); 68	3,600 (X)	91,000	54,000	54,000	54,000	4.70E+07	1.00E+05	4.90E+05
2-Nitrophenol	88755	NA	400	ID	NLV	NLV	NLV	NLV	ID	6.30E+05	NA
n-Nitroso-di-n-propylamine	621647	NA	330 (M); 100	NA	NLV	NLV	NLV	NLV	1.60E+06	1,200	1.50E+06
N-Nitrosodiphenylamine	86306	NA	5,400	NA	NLV	NLV	NLV	NLV	2.20E+09	1.70E+06	NA
Oxamyl	23135220	NA	4,000	NA	NLV	NLV	NLV	NLV	ID	8.60E+06	NA
Oxo-hexyl acetate	88230357	NA	1,500	NA	ID	ID	ID	ID	5.40E+09	2.30E+06	1.00E+07
Pendimethalin	40487421	NA	1.10E+06	NA	NLV	NLV	NLV	NLV	ID	4.60E+07	NA
Pentachlorobenzene	608935	NA	29,000	9,500	ID	ID	ID	ID	ID	3.2E+5 (C)	1.90E+05
Pentachloronitrobenzene	82688	NA	37,000	NA	1.20E+05	2.30E+05	2.30E+05	2.30E+05	3.30E+08	1.70E+06	NA
Pentachlorophenol	87865	NA	22	(G,X)	NLV	NLV	NLV	NLV	1.00E+08	90,000	NA
Pentane	109660	NA	ID	NA	9.7E+5 (C)	3.70E+07	3.10E+08	5.80E+08	1.20E+12	ID	2.40E+05

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2-Pentene (I)	109682	NA	ID	NA	ID	ID	ID	ID	ID	ID	2.20E+05
Phenanthrene	85018	NA	56,000	2,100	2.80E+06	1.60E+05	1.60E+05	1.60E+05	6.70E+06	1.60E+06	NA
Phenol	108952	NA	88,000	9,000	NLV	NLV	NLV	NLV	4.00E+10	4.0E+7 (C, DD)	1.20E+07
Phenytoin	57410	NA	830	4300 (X)	NLV	NLV	NLV	NLV	2.20E+08	1.00E+05	NA
Phosphorus (Total)	7723140	NA	1.30E+06	(EE)	NLV	NLV	NLV	NLV	6.70E+07	1.0E+9 (D)	NA
Phthalic acid	88993	NA	2.80E+05	NA	NLV	NLV	NLV	NLV	ID	4.3E+8 (C)	1.70E+06
Phthalic anhydride	85449	NA	3.00E+05	NA	NLV	NLV	NLV	NLV	ID	4.7E+8 (C)	1.10E+06
Picloram	1918021	NA	10,000	920	NLV	NLV	NLV	NLV	ID	1.60E+07	NA
Piperidine	110894	NA	64	NA	NLV	NLV	NLV	NLV	9.30E+09	99,000	1.20E+08
Polybrominated biphenyls (J)	67774327	NA	NLL	NLL	NLV	NLV	NLV	NLV	ID	1,200	NA
Polychlorinated biphenyls (PCBs) (J,T)	1336363	NA	NLL	NLL	3.00E+06	2.40E+05	7.90E+06	7.90E+06	5.20E+06	(T)	NA
Prometon	1610180	NA	4,900	NA	NLV	NLV	NLV	NLV	ID	5.00E+06	NA
Propachlor	1918167	NA	1,900	NA	NLV	NLV	NLV	NLV	ID	2.90E+06	NA
Propazine	139402	NA	4,000	NA	NLV	NLV	NLV	NLV	ID	6.10E+06	NA
Propionic acid	79094	NA	2.40E+05	ID	NLV	NLV	NLV	NLV	2.00E+10	3.8E+8 (C)	1.10E+08
Propyl alcohol (I)	71238	NA	28,000	NA	NLV	NLV	NLV	NLV	4.90E+10	1.3E+7 (DD)	1.10E+08
n-Propylbenzene (I)	103651	NA	1,600	ID	ID	ID	ID	ID	1.30E+09	2.50E+06	1.00E+07
Propylene glycol	57556	NA	3.00E+06	5.80E+06	NLV	NLV	NLV	NLV	4.00E+11	1.0E+9 (C,D)	1.10E+08
Pyrene	129000	NA	4.80E+05	ID	1.0E+9 (D)	6.50E+08	6.50E+08	6.50E+08	6.70E+09	2.90E+07	NA
Pyridine (I)	110861	NA	400	NA	1,100	8,200	40,000	97,000	2.30E+08	2.3E+5 (C)	37,000
Selenium (B)	7782492	410	4,000	400	NLV	NLV	NLV	NLV	1.30E+08	2.60E+06	NA
Silver (B)	7440224	1,000	4,500	100 (M); 27	NLV	NLV	NLV	NLV	6.70E+06	2.50E+06	NA
Silvex (2,4,5-TP)	93721	NA	3,600	2,200	NLV	NLV	NLV	NLV	ID	1.70E+06	NA
Simazine	122349	NA	80	340	NLV	NLV	NLV	NLV	ID	1.20E+06	NA
Sodium	17341252	NA	4.60E+06	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Sodium azide	26628228	NA	1,800	1,000	ID	ID	ID	ID	ID	2.70E+06	NA
Strontium (B)	7440246	NA	92,000	4.20E+05	NLV	NLV	NLV	NLV	ID	3.30E+08	NA

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Styrene	100425	NA	2,700	2,100 (X)	2.50E+05	9.70E+05	9.70E+05	1.40E+06	5.50E+09	4.00E+05	5.20E+05
Sulfate	14808798	NA	5.00E+06	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Tebuthiuron	34014181	NA	10,000	NA	NLV	NLV	NLV	NLV	ID	4.6E+6 (DD)	NA
2,3,7,8-Tetrabromodibenzo-p-dioxin (O)	50585416	NA	NLL	NLL	NLV	NLV	NLV	NLV	(O)	(O)	NA
1,2,4,5-Tetrachlorobenzene	95943	NA	1.50E+06	3,400 (X)	5.80E+05	2.30E+05	2.30E+05	2.30E+05	6.70E+07	7.70E+07	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (O)	1746016	NA	NLL	NLL	NLV	NLV	NLV	NLV	71 (O)	0.09 (O)	NA
1,1,1,2-Tetrachloroethane	630206	NA	1,500	ID	6,200	36,000	54,000	1.00E+05	4.20E+08	4.8E+5 (C)	4.40E+05
1,1,2,2-Tetrachloroethane	79345	NA	170	1,600 (X)	4,300	10,000	10,000	14,000	5.40E+07	53,000	8.70E+05
Tetrachloroethylene	127184	NA	100	1,200 (X)	11,000	1.70E+05	4.80E+05	1.10E+06	2.70E+09	2.0E+5 (C)	88,000
Tetrahydrofuran	109999	NA	1,900	2.2E+5 (X)	1.30E+06	1.30E+07	6.70E+07	1.60E+08	3.90E+11	2.90E+06	1.20E+08
Tetranitromethane	509148	NA	ID	NA	500(M); 110	500 (M); 51	ID	ID	2.10E+05	ID	ID
Thallium (B)	7440280	NA	2,300	4,200 (X)	NLV	NLV	NLV	NLV	1.30E+07	35,000	NA
Toluene (I)	108883	NA	16,000	5,400	3.3E+5 (C)	2.80E+06	5.10E+06	1.20E+07	2.70E+10	5.0E+7 (C)	2.50E+05
p-Toluidine	106490	NA	660 (M); 300	NA	NLV	NLV	NLV	NLV	1.00E+08	94,000	1.20E+06
Toxaphene	8001352	NA	24,000	8,200	NLV	NLV	NLV	NLV	9.70E+06	20,000	NA
Triallate	2303175	NA	95,000	NA	ID	ID	ID	ID	ID	2.9E+6 (C)	2.50E+05
Tributylamine	102829	NA	7,800	ID	5.80E+05	6.00E+05	6.00E+05	6.00E+05	4.70E+08	7.90E+05	3.70E+06
1,2,4-Trichlorobenzene	120821	NA	4,200	5,900 (X)	9.6E+6 (C)	2.80E+07	2.80E+07	2.80E+07	2.50E+10	9.9E+5 (DD)	1.10E+06
1,1,1-Trichloroethane	71556	NA	4,000	1,800	2.50E+05	3.80E+06	1.20E+07	2.80E+07	6.70E+10	5.0E+8 (C)	4.60E+05
1,1,2-Trichloroethane	79005	NA	100	6,600 (X)	4,600	17,000	21,000	44,000	1.90E+08	1.80E+05	9.20E+05
Trichloroethylene	79016	NA	100	4,000 (X)	1,000	11,000	25,000	57,000	1.30E+08	1.1E+5 (DD)	5.00E+05
Trichlorofluoromethane	75694	NA	52,000	NA	2.8E+6 (C)	9.20E+07	6.30E+08	1.50E+09	3.80E+12	7.9E+7 (C)	5.60E+05
2,4,5-Trichlorophenol	95954	NA	39,000	NA	NLV	NLV	NLV	NLV	2.30E+10	2.30E+07	NA
2,4,6-Trichlorophenol	88062	NA	2,400	330 (M); 100	NLV	NLV	NLV	NLV	1.00E+09	7.10E+05	NA
1,2,3-Trichloropropane	96184	NA	840	NA	4,000	9,200	9,200	11,000	2.00E+07	1.3E+6 (C)	8.30E+05
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	NA	9.0E+6 (C)	1,700	5.1E+6 (C)	1.80E+08	8.80E+08	2.10E+09	5.10E+12	1.0E+9 (C,D)	5.50E+05
Triethanolamine	102716	NA	74,000	NA	NLV	NLV	NLV	NLV	3.30E+09	1.10E+08	1.10E+08

DEQ

TABLE 2. SOIL: RESIDENTIAL

PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

			Groundwater Protection		Indoor Air	Ambient Air (Y) (C)				Contact	Csat
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Level	Residential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Triethylene glycol	112276	NA	86,000	NA	NLV	NLV	NLV	NLV	ID	3.9E+7 (C,DD)	1.10E+05
3-Trifluoromethyl-4-nitrophenol	88302	NA	1.10E+05	NA	NLV	NLV	NLV	NLV	ID	4.1E+7 (DD)	NA
Trifluralin	1582098	NA	1.90E+05	NA	ID	ID	ID	ID	ID	2.00E+06	NA
2,2,4-Trimethyl pentane	540841	NA	ID	NA	1.1E+5 (C)	5.20E+06	3.90E+07	9.60E+07	2.30E+11	ID	19,000
2,4,4-Trimethyl-2-pentene (I)	107404	NA	ID	NA	ID	ID	ID	ID	ID	ID	56,000
1,2,4-Trimethylbenzene (I)	95636	NA	2,100	570	4.3E+6 (C)	2.10E+07	5.00E+08	5.00E+08	8.20E+10	3.2E+7 (C)	1.10E+05
1,3,5-Trimethylbenzene (I)	108678	NA	1,800	1,100	2.6E+6 (C)	1.60E+07	3.80E+08	3.80E+08	8.20E+10	3.2E+7 (C)	94,000
Triphenyl phosphate	115866	NA	1.5E+6 (C)	NA	NLV	NLV	NLV	NLV	ID	3.6E+7 (C)	1.10E+05
tris(2,3-Dibromopropyl)phosphate	126727	NA	930	ID	82,000 (C)	18,000	18,000	18,000	5.90E+06	4,400	27,000
Urea	57136	NA	ID	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Vanadium	7440622	NA	72,000	4.30E+05	NLV	NLV	NLV	NLV	ID	7.5E+5 (DD)	NA
Vinyl acetate (I)	108054	NA	13,000	NA	7.90E+05	1.70E+06	2.60E+06	5.80E+06	1.30E+10	5.8E+6 (C,DD)	2.40E+06
Vinyl chloride	75014	NA	40	260 (X)	270	4,200	30,000	73,000	3.50E+08	3,800	4.90E+05
White phosphorus (R)	12185103	NA	2.2	NA	NLV	NLV	NLV	NLV	ID	2,300 (DD)	NA
Xylenes (I)	1330207	NA	5,600	820	6.3E+6 (C)	4.60E+07	6.10E+07	1.30E+08	2.90E+11	4.1E+8 (C)	1.50E+05
Zinc (B)	7440666	47,000	2.40E+06	(G)	NLV	NLV	NLV	NLV	ID	1.70E+08	NA

DEQ

TABLE 3. SOIL: NONRESIDENTIAL

PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

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			Groundwater Protection			Indoor Air	Ambient Air (Y) (C)				Contact	Csat
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria	Nonresidential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Acenaphthene	83329	NA	3.00E+05	8.80E+05	8,700	3.50E+08	9.70E+07	9.70E+07	9.70E+07	6.20E+09	1.30E+08	NA
Acenaphthylene	208968	NA	5,900	17,000	ID	3.00E+06	2.70E+06	2.70E+06	2.70E+06	1.00E+09	5.20E+06	NA
Acetaldehyde (I)	75070	NA	19,000	54,000	2,600	4.00E+05	2.10E+05	2.10E+05	2.90E+05	2.60E+08	9.50E+07	1.10E+08
Acetate	71501	NA	ID	ID	(G)	ID	ID	ID	ID	ID	ID	ID
Acetic acid	64197	NA	84,000	2.40E+05	(G)	NLV	NLV	NLV	NLV	7.40E+09	4.20E+08	6.50E+08
Acetone (I)	67641	NA	15,000	42,000	34,000	5.4E+8 (C)	1.60E+08	1.60E+08	2.00E+08	1.70E+11	7.30E+07	1.10E+08
Acetonitrile	75058	NA	2,800	8,000	NA	8.80E+06	1.90E+06	1.90E+06	2.20E+06	1.80E+09	1.40E+07	2.20E+07
Acetophenone	98862	NA	30,000	88,000	ID	2.1E+8 (C)	5.20E+07	5.20E+07	5.20E+07	1.40E+10	1.5E+8 (C)	1.10E+06
Acrolein (I)	107028	NA	2,400	6,600	NA	760	370	370	630	5.90E+05	1.20E+07	2.30E+07
Acrylamide	79061	NA	10	10	200 (X)	NLV	NLV	NLV	NLV	3.00E+06	8,700	NA
Acrylic acid	79107	NA	78,000	2.20E+05	NA	5.50E+06	2.20E+05	2.70E+05	2.70E+05	2.90E+07	2.1E+8 (C,DD)	1.10E+08
Acrylonitrile (I)	107131	NA	100 (M); 52	220	100 (M); 40	35,000	17,000	17,000	31,000	5.80E+07	74,000	8.30E+06
Alachlor	15972608	NA	52	52	290 (X)	NLV	NLV	NLV	NLV	ID	3.90E+05	NA
Aldicarb	116063	NA	60	60	NA	NLV	NLV	NLV	NLV	ID	7.30E+05	NA
Aldicarb sulfone	1646884	NA	200 (M); 40	200 (M); 40	NA	NLV	NLV	NLV	NLV	ID	8.00E+05	NA
Aldicarb sulfoxide	1646873	NA	200(M); 80	200 (M); 80	NA	NLV	NLV	NLV	NLV	ID	9.50E+05	NA
Aldrin	309002	NA	NLL	NLL	NLL	7.10E+06	2.00E+05	2.00E+05	2.00E+05	8.00E+05	4,300	NA
Aluminum (B)	7429905	6.90E+06	1,000	1,000	NA	NLV	NLV	NLV	NLV	ID	3.7E+8 (DD)	NA
Ammonia	7664417	NA	ID	ID	(CC)	ID	ID	ID	ID	2.90E+09	ID	1.00E+07
t-Amyl methyl ether (TAME)	994058	NA	3,900	3,900	NA	1.10E+05	4.00E+05	7.80E+05	1.80E+06	1.80E+09	9.5E+7 (C)	4.40E+05
Aniline	62533	NA	1,100	4,400	330 (M); 80	NLV	NLV	NLV	NLV	2.90E+07	1.50E+06	4.50E+06
Anthracene	120127	NA	41,000	41,000	ID	1.0E+9 (D)	1.60E+09	1.60E+09	1.60E+09	2.90E+10	7.30E+08	NA
Antimony	7440360	NA	4,300	4,300	94,000 (X)	NLV	NLV	NLV	NLV	5.90E+06	6.70E+05	NA
Arsenic	7440382	5,800	4,600	4,600	4,600	NLV	NLV	NLV	NLV	9.10E+05	37,000	NA
Asbestos (BB)	1332214	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.0E+7 (M); 85,000	ID	NA
Atrazine	1912249	NA	60	60	150	NLV	NLV	NLV	NLV	ID	3.3E+5 (DD)	NA
Azobenzene	103333	NA	4,200	17,000	ID	3.20E+07	2.10E+06	2.10E+06	2.10E+06	1.30E+08	6.60E+05	NA

DEQ

TABLE 3. SOIL: NONRESIDENTIAL

PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

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			Groundwater Protection			Indoor Air	Ambient Air (Y) (C)				Contact	Csat
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria	Nonresidential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Barium (B)	7440393	75,000	1.30E+06	1.30E+06	(G)	NLV	NLV	NLV	NLV	1.50E+08	1.30E+08	NA
Benzene (I)	71432	NA	100	100	4,000 (X)	8,400	45,000	99,000	2.30E+05	4.70E+08	8.4E+5 (C)	4.00E+05
Benzidine	92875	NA	1,000 (M); 6.0	1,000 (M); 6.0	1,000 (M); 6.0	NLV	NLV	NLV	NLV	59,000	1,000 (M); 110	NA
Benzo(a)anthracene (Q)	56553	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	80,000	NA
Benzo(b)fluoranthene (Q)	205992	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	80,000	NA
Benzo(k)fluoranthene (Q)	207089	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	8.00E+05	NA
Benzo(g,h,i)perylene	191242	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	3.50E+08	7.00E+06	NA
Benzo(a)pyrene (Q)	50328	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.90E+06	8,000	NA
Benzoic acid	65850	NA	6.40E+05	1.80E+06	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Benzyl alcohol	100516	NA	2.00E+05	5.80E+05	NA	NLV	NLV	NLV	NLV	1.50E+11	1.0E+9 (C,D)	5.80E+06
Benzyl chloride	100447	NA	150	640	NA	33,000	48,000	48,000	52,000	7.80E+07	2.20E+05	2.30E+05
Beryllium	7440417	NA	51,000	51,000	(G)	NLV	NLV	NLV	NLV	5.90E+05	1.60E+06	NA
bis(2-Chloroethoxy)ethane	112265	NA	ID	ID	ID	NLV	NLV	NLV	NLV	ID	ID	2.70E+06
bis(2-Chloroethyl)ether (I)	111444	NA	100	170	100 (M); 20	44,000	13,000	13,000	13,000	1.20E+07	58,000	2.20E+06
bis(2-Ethylhexyl)phthalate	117817	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	8.90E+08	1.2E+7 (C)	1.00E+07
Boron (B)	7440428	NA	10,000	10,000	1.4E+5 (X)	NLV	NLV	NLV	NLV	ID	3.5E+8 (DD)	NA
Bromate	15541454	NA	200	200	800 (X)	NLV	NLV	NLV	NLV	ID	91,000	NA
Bromobenzene (I)	108861	NA	550	1,500	NA	5.80E+05	5.40E+05	5.40E+05	5.40E+05	2.40E+08	1.7E+6 (C)	7.60E+05
Bromodichloromethane	75274	NA	1,600 (W)	1,600 (W)	ID	6,400	31,000	31,000	57,000	1.10E+08	4.90E+05	1.50E+06
Bromoform	75252	NA	1,600 (W)	1,600 (W)	ID	7.70E+05	3.10E+06	3.10E+06	3.10E+06	3.60E+09	3.8E+6 (C)	8.70E+05
Bromomethane	74839	NA	200	580	700	1,600	13,000	57,000	1.40E+05	1.50E+08	1.00E+06	2.20E+06
n-Butanol (I)	71363	NA	19,000	54,000	2.00E+05	NLV	NLV	NLV	NLV	1.00E+10	9.5E+7 (C)	8.70E+06
2-Butanone (MEK) (I)	78933	NA	2.60E+05	7.60E+05	44,000	9.9E+7 (C)	3.50E+07	3.50E+07	3.60E+07	2.90E+10	7.0E+8 (C,DD)	2.70E+07
n-Butyl acetate	123864	NA	11,000	32,000	NA	1.0E+8 (C)	1.40E+08	3.10E+08	3.50E+08	2.10E+11	5.5E+7 (C)	1.10E+06
t-Butyl alcohol	75650	NA	78,000	2.20E+05	NA	5.8E+8 (C)	1.20E+08	2.40E+08	2.40E+08	5.60E+10	3.9E+8 (C)	1.10E+08
Butyl benzyl phthalate	85687	NA	2.2E+6 (C)	5.0E+6 (C)	1.2E+5 (X)	NLV	NLV	NLV	NLV	2.10E+10	1.2E+8 (C)	3.10E+05
n-Butylbenzene	104518	NA	1,600	4,600	ID	ID	ID	ID	ID	8.80E+08	8.00E+06	1.00E+07

TABLE 3. SOIL: NONRESIDENTIAL

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sec-Butylbenzene	135988	NA	1,600	4,600	ID	ID	ID	ID	ID	1.80E+08	8.00E+06	1.00E+07
t-Butylbenzene (I)	98066	NA	1,600	4,600	ID	ID	ID	ID	ID	2.90E+08	8.00E+06	1.00E+07
Cadmium (B)	7440439	1,200	6,000	6,000	(G,X)	NLV	NLV	NLV	NLV	2.20E+06	2.10E+06	NA
Camphene (I)	79925	NA	ID	ID	NA	6,700	1.80E+05	9.10E+05	2.20E+06	2.40E+09	ID	NA
Caprolactam	105602	NA	1.20E+05	3.40E+05	NA	NLV	NLV	NLV	NLV	2.90E+08	3.1E+8 (DD)	NA
Carbaryl	63252	NA	14,000	40,000	NA	ID	ID	ID	ID	ID	7.00E+07	NA
Carbazole	86748	NA	9,400	39,000	1,100	NLV	NLV	NLV	NLV	7.80E+07	2.40E+06	NA
Carbofuran	1563662	NA	800	800	NA	NLV	NLV	NLV	NLV	ID	3.60E+06	NA
Carbon disulfide (I,R)	75150	NA	16,000	46,000	ID	1.40E+05	1.60E+06	8.00E+06	1.90E+07	2.10E+10	4.3E+7 (C,DD)	2.80E+05
Carbon tetrachloride	56235	NA	100	100	900 (X)	990	12,000	34,000	79,000	1.70E+08	4.4E+5 (C)	3.90E+05
Chlordane (J)	57749	NA	NLL	NLL	NLL	5.90E+07	4.20E+06	4.20E+06	4.20E+06	2.10E+07	1.50E+05	NA
Chloride	16887006	NA	5.00E+06	5.00E+06	(X)	NLV	NLV	NLV	NLV	ID	5.0E+5 (F)	NA
Chlorobenzene (I)	108907	NA	2,000	2,000	500	2.20E+05	9.20E+05	1.10E+06	2.10E+06	2.10E+09	1.4E+7 (C)	2.60E+05
p-Chlorobenzene sulfonic acid	98668	NA	1.50E+05	4.20E+05	ID	ID	ID	ID	ID	ID	7.30E+08	ID
1-Chloro-1,1-difluoroethane	75683	NA	3.00E+05	8.80E+05	NA	5.4E+6 (C)	9.40E+07	5.70E+08	1.40E+09	1.50E+12	1.0E+9 (C,D)	9.60E+05
Chloroethane	75003	NA	8,600	34,000	22,000 (X)	5.3E+6 (C)	3.60E+07	1.20E+08	2.80E+08	2.90E+11	1.2E+7 (C)	9.50E+05
2-Chloroethyl vinyl ether	110758	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	1.90E+06
Chloroform	67663	NA	1,600 (W)	1,600 (W)	7,000	38,000	1.50E+05	3.40E+05	7.90E+05	1.60E+09	5.5E+6 (C)	1.50E+06
Chloromethane (I)	74873	NA	5,200	22,000	ID	10,000	1.20E+05	1.00E+06	2.50E+06	2.60E+09	7.4E+6 (C)	1.10E+06
4-Chloro-3-methylphenol	59507	NA	5,800	16,000	280	NLV	NLV	NLV	NLV	ID	1.50E+07	NA
beta-Chloronaphthalene	91587	NA	6.20E+05	1.80E+06	NA	ID	ID	ID	ID	ID	1.80E+08	NA
2-Chlorophenol	95578	NA	900	2,600	360	8.00E+05	1.10E+06	1.10E+06	1.10E+06	5.30E+08	4.50E+06	1.90E+07
o-Chlorotoluene (I)	95498	NA	3,300	9,300	ID	5.00E+05	1.50E+06	3.10E+06	6.40E+06	2.10E+09	1.5E+7 (C)	5.00E+05
Chlorpyrifos	2921882	NA	17,000	48,000	1,500	240	5,500	23,000	56,000	5.90E+07	3.40E+07	NA
Chromium (III) (B,H)	16065831	18,000 (total)	1.0E+9 (D)	1.0E+9 (D)	(G,X)	NLV	NLV	NLV	NLV	1.50E+08	1.0E+9 (D)	NA
Chromium (VI)	18540299	NA	30,000	30,000	3,300	NLV	NLV	NLV	NLV	2.40E+05	9.20E+06	NA
Chrysene (Q)	218019	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	8.00E+06	NA

TABLE 3. SOIL: NONRESIDENTIAL

PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

All criteria, unless otherwise noted, are expressed in units of parts per billion (ppb). One ppb is equivalent to 1 microgram per kilogram (ug/kg). Criteria with 6 or more digits are expressed in scientific notation. For example, 200,000 is presented as 2.0E+5. A footnote is designated by a letter in parentheses and is explained in the footnote pages that follow the criteria tables. When the risk-based criterion is less than the target detection limit (TDL), the TDL is listed as the criterion (§324.20120a(10)). In these cases, 2 numbers are present in the cell. The first number is the criterion (i.e., TDL), and the second number is the risk-based value.

			Groundwater Protection			Indoor Air	Ambient Air (Y) (C)				Contact	Csat
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria	Nonresidential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
Cobalt	7440484	6,800	800	2,000	2,000	NLV	NLV	NLV	NLV	5.90E+06	9.00E+06	NA
Copper (B)	7440508	32,000	5.80E+06	5.80E+06	(G)	NLV	NLV	NLV	NLV	5.90E+07	7.30E+07	NA
Cyanazine	21725462	NA	200	200	1,100 (X)	NLV	NLV	NLV	NLV	ID	66,000	NA
Cyanide (P,R)	57125	390 (total)	4,000	4,000	100	NLV	NLV	NLV	NLV	2.50E+05	2.50E+05	NA
Cyclohexanone	108941	NA	5.20E+06	1.50E+07	NA	32,000	1.30E+06	1.10E+07	2.70E+07	2.90E+10	1.0E+9 (C,D)	2.20E+08
Dacthal	1861321	NA	50,000	1.40E+05	NA	NLV	NLV	NLV	NLV	ID	7.30E+06	NA
Dalapon	75990	NA	4,000	4,000	NA	NLV	NLV	NLV	NLV	ID	6.2E+7 (C)	5.90E+07
4-4'-DDD	72548	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	5.60E+07	4.00E+05	NA
4-4'-DDE	72559	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	4.00E+07	1.90E+05	NA
4-4'-DDT	50293	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	4.00E+07	2.80E+05	NA
Decabromodiphenyl ether	1163195	NA	1.40E+05	1.40E+05	NA	1.0E+9 (D)	1.00E+08	1.00E+08	1.00E+08	1.00E+09	1.10E+07	NA
Di-n-butyl phthalate	84742	NA	9.6E+5 (C)	2.7E+6 (C)	11,000	NLV	NLV	NLV	NLV	1.50E+09	8.7E+7 (C)	7.60E+05
Di(2-ethylhexyl) adipate	103231	NA	1.3E+7 (C)	1.3E+7 (C)	ID	NLV	NLV	NLV	NLV	1.20E+10	6.3E+7 (C,DD)	9.60E+05
Di-n-octyl phthalate	117840	NA	1.00E+08	2.9E+8 (C)	ID	NLV	NLV	NLV	NLV	1.40E+10	2.00E+07	1.40E+08
Diacetone alcohol (I)	123422	NA	ID	ID	NA	NLV	NLV	NLV	NLV	7.10E+10	ID	1.10E+08
Diazinon	333415	NA	95	280	72	NLV	NLV	NLV	NLV	ID	70,000 (DD)	3.10E+05
Dibenzo(a,h)anthracene (Q)	53703	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	8,000	NA
Dibenzofuran	132649	NA	ID	ID	1,700	3.60E+06	1.60E+05	1.60E+05	1.60E+05	2.90E+06	ID	NA
Dibromochloromethane	124481	NA	1,600 (W)	1,600 (W)	ID	21,000	80,000	80,000	98,000	1.60E+08	5.00E+05	6.10E+05
Dibromochloropropane	96128	NA	10 (M); 4.0	10 (M); 4.0	ID	1,200	900	900	900	7.00E+05	20,000 (C)	1,200
Dibromomethane	74953	NA	1,600	4,600	NA	ID	ID	ID	ID	ID	8.0E+6 (C)	2.00E+06
Dicamba	1918009	NA	4,400	13,000	NA	NLV	NLV	NLV	NLV	ID	1.70E+07	NA
1,2-Dichlorobenzene	95501	NA	14,000	14,000	280	2.0E+7 (C)	4.60E+07	4.60E+07	5.50E+07	4.40E+10	6.3E+7 (C)	2.10E+05
1,3-Dichlorobenzene	541731	NA	170	480	680	48,000	94,000	94,000	1.10E+05	8.80E+07	6.6E+5 (C)	1.70E+05
1,4-Dichlorobenzene	106467	NA	1,700	1,700	360	1.00E+05	2.60E+05	2.60E+05	3.40E+05	5.70E+08	1.90E+06	NA
3,3'-Dichlorobenzidine	91941	NA	2,000 (M); 28	2,000 (M); 110	2,000 (M); 7.4	NLV	NLV	NLV	NLV	8.20E+06	30,000	NA
Dichlorodifluoromethane	75718	NA	95,000	2.70E+05	ID	1.70E+06	6.30E+07	5.50E+08	1.40E+09	1.50E+12	1.7E+8 (C)	1.00E+06

TABLE 3. SOIL: NONRESIDENTIAL

PART 201 GENERIC CLEANUP CRITERIA AND SCREENING LEVELS/PART 213 RISK-BASED SCREENING LEVELS

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Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria	Nonresidential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
1,1-Dichloroethane	75343	NA	18,000	50,000	15,000	4.30E+05	2.50E+06	6.00E+06	1.40E+07	1.50E+10	8.7E+7 (C)	8.90E+05
1,2-Dichloroethane (I)	107062	NA	100	100	7,200 (X)	11,000	21,000	33,000	74,000	1.50E+08	4.20E+05	1.20E+06
1,1-Dichloroethylene (I)	75354	NA	140	140	2,600	330	3,700	15,000	37,000	7.80E+07	6.6E+5 (C)	5.70E+05
cis-1,2-Dichloroethylene	156592	NA	1,400	1,400	12,000	41,000	2.10E+05	4.30E+05	1.00E+06	1.00E+09	8.0E+6 (C)	6.40E+05
trans-1,2-Dichloroethylene	156605	NA	2,000	2,000	30,000 (X)	43,000	3.30E+05	8.40E+05	2.00E+06	2.10E+09	1.2E+7 (C)	1.40E+06
2,6-Dichloro-4-nitroaniline	99309	NA	44,000	1.30E+05	NA	NLV	NLV	NLV	NLV	ID	2.20E+08	NA
2,4-Dichlorophenol	120832	NA	1,500	4,200	330 (M); 220	NLV	NLV	NLV	NLV	2.30E+09	3.9E+6 (C,DD)	1.80E+06
2,4-Dichlorophenoxyacetic acid	94757	NA	1,400	1,400	4,400	NLV	NLV	NLV	NLV	2.90E+09	8.60E+06	NA
1,2-Dichloropropane (I)	78875	NA	100	100	4,600 (X)	7,400	30,000	51,000	1.20E+05	1.20E+08	6.6E+5 (C)	5.50E+05
1,3-Dichloropropene	542756	NA	170	700	180 (X)	5,400	60,000	2.00E+05	4.70E+05	5.90E+08	2.40E+05	6.20E+05
Dichlorovos	62737	NA	50 (M); 32	130	NA	NLV	NLV	NLV	NLV	1.50E+07	47,000	2.20E+06
Dicyclohexyl phthalate	84617	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	NA
Dieldrin	60571	NA	NLL	NLL	NLL	7.20E+05	64,000	64,000	64,000	8.50E+05	4,700	NA
Diethyl ether	60297	NA	200	200	ID	5.2E+7 (C)	1.00E+08	1.60E+08	3.50E+08	3.50E+11	3.6E+8 (C)	7.40E+06
Diethyl phthalate	84662	NA	1.10E+05	3.20E+05	2,200	NLV	NLV	NLV	NLV	1.50E+09	5.5E+8 (C)	7.40E+05
Diethylene glycol monobutyl ether	112345	NA	1,800	5,000	NA	NLV	NLV	NLV	NLV	5.90E+08	8.70E+06	1.10E+08
Diisopropyl ether	108203	NA	600	1,700 (C)	ID	1.2E+6 (C)	3.20E+06	4.80E+06	1.00E+07	1.10E+10	3.0E+6 (C)	1,300
Diisopropylamine (I)	108189	NA	110	320	NA	1.0E+7 (C)	7.40E+06	7.40E+06	7.70E+06	5.90E+09	5.60E+05	6.70E+06
Dimethyl phthalate	131113	NA	1.5E+6 (C)	4.2E+6 (C)	NA	NLV	NLV	NLV	NLV	1.50E+09	1.0E+9 (C,D)	7.90E+05
N,N-Dimethylacetamide	127195	NA	3,600	10,000	82,000 (X)	NLV	NLV	NLV	NLV	ID	1.80E+07	1.10E+08
N,N-Dimethylaniline	121697	NA	320	920	NA	8.9E+5 (C)	5.20E+05	5.20E+05	5.20E+05	3.30E+08	1.6E+6 (C)	8.00E+05
Dimethylformamide (I)	68122	NA	14,000	40,000	NA	NLV	NLV	NLV	NLV	8.80E+08	7.00E+07	1.10E+08
2,4-Dimethylphenol	105679	NA	7,400	20,000	7,600	NLV	NLV	NLV	NLV	2.10E+09	3.60E+07	NA
2,6-Dimethylphenol	576261	NA	330 (M); 88	330 (M); 260	NA	NLV	NLV	NLV	NLV	5.90E+07	4.40E+05	NA
3,4-Dimethylphenol	95658	NA	330 (M); 200	580	500	NLV	NLV	NLV	NLV	1.00E+08	1.00E+06	NA
Dimethylsulfoxide	67685	NA	4.40E+06	1.30E+07	3.80E+06	NLV	NLV	NLV	NLV	5.90E+08	1.0E+9 (C,D)	1.80E+07
2,4-Dinitrotoluene	121142	NA	430	640	NA	NLV	NLV	NLV	NLV	2.00E+07	2.20E+05	NA

TABLE 3. SOIL: NONRESIDENTIAL

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Dinoseb	88857	NA	300	300	200 (M); 43	NLV	NLV	NLV	NLV	1.20E+08	3.9E+5 (C,DD)	1.40E+05
1,4-Dioxane (I)	123911	NA	1,700	7,000	56,000 (X)	NLV	NLV	NLV	NLV	7.10E+08	2.40E+06	9.70E+07
Diquat	85007	NA	400	400	400	NLV	NLV	NLV	NLV	ID	1.60E+06	NA
Diuron	330541	NA	620	1,800	NA	NLV	NLV	NLV	NLV	2.10E+08	3.10E+06	NA
Endosulfan (J)	115297	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	4.40E+06	NA
Endothall	145733	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.00E+09	1.20E+07	NA
Endrin	72208	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	1.90E+05	NA
Epichlorohydrin (I)	106898	NA	100	100	NA	1.20E+05	37,000	37,000	37,000	2.90E+07	41,000	7.30E+06
Ethanol (I)	64175	NA	3.80E+07	7.60E+07	ID	NLV	NLV	NLV	NLV	5.60E+11	1.0E+9 (C,D,DDD)	1.10E+08
Ethyl acetate (I)	141786	NA	1.30E+05	3.80E+05	NA	7.0E+7 (C)	5.90E+07	5.90E+07	1.00E+08	9.40E+10	6.6E+8 (C)	7.50E+06
Ethyl-tert-butyl ether (ETBE)	637923	NA	980	980	ID	1.7E+6 (C)	2.30E+06	4.60E+06	1.10E+07	1.10E+10	ID	6.50E+05
Ethylbenzene (I)	100414	NA	1,500	1,500	360	4.6E+5 (C)	2.40E+06	3.10E+06	6.50E+06	1.30E+10	7.1E+7 (C)	1.40E+05
Ethylene dibromide	106934	NA	20 (M); 1.0	20 (M); 1.0	110 (X)	3,600	5,800	5,800	9,800	1.80E+07	430	8.90E+05
Ethylene glycol	107211	NA	3.00E+05	8.40E+05	3.8E+6 (X)	NLV	NLV	NLV	NLV	2.90E+10	1.0E+9 (C,D)	1.10E+08
Ethylene glycol monobutyl ether	111762	NA	74,000	2.00E+05	NA	1.40E+06	2.10E+07	1.50E+08	3.60E+08	3.80E+11	3.6E+8 (C)	4.10E+07
Fluoranthene	206440	NA	7.30E+05	7.30E+05	5,500	1.0E+9 (D)	8.90E+08	8.80E+08	8.80E+08	4.10E+09	1.30E+08	NA
Fluorene	86737	NA	3.90E+05	8.90E+05	5,300	1.0E+9 (D)	1.50E+08	1.50E+08	1.50E+08	4.10E+09	8.70E+07	NA
Fluorine (soluble fluoride) (B)	7782414	NA	40,000	40,000	ID	NLV	NLV	NLV	NLV	ID	6.7E+7 (DD)	NA
Formaldehyde	50000	NA	26,000	76,000	2,400	65,000	43,000	69,000	1.50E+05	2.60E+08	1.3E+8 (C)	6.00E+07
Formic acid (I,U)	64186	NA	2.00E+05	5.80E+05	ID	2.80E+06	2.60E+05	1.60E+05	1.60E+05	5.90E+07	1.0E+9 (C,D)	1.10E+08
1-Formylpiperidine	2591868	NA	1,600	4,600	NA	ID	ID	ID	ID	ID	8.00E+06	1.00E+07
Gentian violet	548629	NA	300	1,300	NA	NLV	NLV	NLV	NLV	ID	4.40E+05	NA
Glyphosate	1071836	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	5.7E+7 (DD)	NA
Heptachlor	76448	NA	NLL	NLL	NLL	1.90E+06	2.10E+05	2.10E+05	2.10E+05	3.00E+06	23,000	NA
Heptachlor epoxide	1024573	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.50E+06	9,500	NA
n-Heptane	142825	NA	4.6E+7 (C)	1.3E+8 (C)	NA	2.7E+6 (C)	2.50E+07	4.50E+07	1.00E+08	1.00E+11	1.0E+9 (C,D)	2.40E+05

DEQ

TABLE 3. SOIL: NRESIDENTIAL

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Hexabromobenzene	87821	NA	5,400	5,400	ID	ID	ID	ID	ID	ID	3.10E+06	NA
Hexachlorobenzene (C-66)	118741	NA	1,800	1,800	350	2.20E+05	56,000	56,000	56,000	8.50E+06	37,000	NA
Hexachlorobutadiene (C-46)	87683	NA	26,000	72,000	91	7.1E+5 (C)	4.60E+05	4.60E+05	4.60E+05	1.80E+08	4.7E+5 (C)	3.50E+05
alpha-Hexachlorocyclohexane	319846	NA	18	71	ID	1.60E+05	41,000	86,000	86,000	2.10E+06	12,000	NA
beta-Hexachlorocyclohexane	319857	NA	37	150	ID	NLV	NLV	NLV	NLV	7.40E+06	25,000	NA
Hexachlorocyclopentadiene (C-56)	77474	NA	3.20E+05	3.20E+05	ID	56,000	60,000	60,000	60,000	5.90E+06	6.7E+6 (C)	7.20E+05
Hexachloroethane	67721	NA	430	1,200	1,800 (X)	79,000	6.60E+05	1.40E+06	1.40E+06	1.00E+08	7.30E+05	NA
n-Hexane	110543	NA	1.8E+5 (C)	5.1E+5 (C)	NA	9.5E+5 (C)	3.50E+06	3.50E+06	6.40E+06	5.90E+09	3.0E+8 (C)	44,000
2-Hexanone	591786	NA	20,000	58,000	ID	1.80E+06	1.30E+06	1.30E+06	1.50E+06	1.20E+09	1.0E+8 (C)	2.50E+06
Indeno(1,2,3-cd)pyrene (Q)	193395	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	80,000	NA
Iron (B)	7439896	1.20E+07	6,000	6,000	NA	NLV	NLV	NLV	NLV	ID	5.80E+08	NA
Isobutyl alcohol (I)	78831	NA	46,000	1.30E+05	NA	4.3E+8 (C)	9.50E+07	9.50E+07	9.50E+07	4.40E+10	2.3E+8 (C)	8.90E+06
Isophorone	78591	NA	15,000	62,000	26,000 (X)	NLV	NLV	NLV	NLV	8.20E+09	2.2E+7 (C)	2.40E+06
Isopropyl alcohol (I)	67630	NA	9,400	26,000	1.1E+6 (X)	NLV	NLV	NLV	NLV	6.50E+09	4.70E+07	1.10E+08
Isopropyl benzene	98828	NA	91,000	2.60E+05	3,200	7.3E+5 (C)	2.00E+06	2.00E+06	3.00E+06	2.60E+09	8.0E+7 (C)	3.90E+05
Lead (B)	7439921	21,000	7.00E+05	7.00E+05	(G,X)	NLV	NLV	NLV	NLV	4.40E+07	9.0E+5 (DD)	NA
Lindane	58899	NA	20 (M); 7.0	20 (M); 7.0	20 (M); 1.1	ID	ID	ID	ID	ID	42,000	NA
Lithium (B)	7439932	9,800	3,400	7,000	8,800	NLV	NLV	NLV	NLV	1.00E+09	3.1E+7 (DD)	NA
Magnesium (B)	7439954	NA	8.00E+06	2.20E+07	NA	NLV	NLV	NLV	NLV	2.90E+09	1.0E+9 (D)	NA
Manganese (B)	7439965	4.40E+05	1,000	1,000	(G,X)	NLV	NLV	NLV	NLV	1.50E+06	9.00E+07	NA
Mercury (Total) (B,Z)	Varies	130	1,700	1,700	50 (M); 1.2	89,000	62,000	62,000	62,000	8.80E+06	5.80E+05	NA
Methane	74828	NA	ID	ID	NA	8.4E+6 ug/m^3 (GG)	ID	ID	ID	ID	ID	ID
Methanol	67561	NA	74,000	2.00E+05	1.2E+7 (C)	6.7E+7 (C)	3.70E+07	4.60E+07	9.70E+07	9.60E+10	3.6E+8 (C)	3.10E+06
Methoxychlor	72435	NA	16,000	16,000	NA	ID	ID	ID	ID	ID	5.60E+06	NA
2-Methoxyethanol (I)	109864	NA	150	420	NA	NLV	NLV	NLV	NLV	5.90E+08	7.30E+05	1.10E+08
2-Methyl-4-chlorophenoxyacetic acid	94746	NA	390	1,100	NA	NLV	NLV	NLV	NLV	ID	7.30E+05	NA
2-Methyl-4,6-dinitrophenol	534521	NA	830 (M); 400	830 (M); 400	NA	NLV	NLV	NLV	NLV	5.90E+07	2.60E+05	NA

TABLE 3. SOIL: NONRESIDENTIAL

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			Groundwater Protection			Indoor Air	Ambient Air (Y) (C)				Contact	Csat
Hazardous Substance	Chemical Abstract Service Number	Statewide Default Background Levels	Residential Drinking Water Protection Criteria	Nonresidential Drinking Water Protection Criteria	Groundwater Surface Water Interface Protection Criteria	Soil Volatilization to Indoor Air Inhalation Criteria	Infinite Source Volatile Soil Inhalation Criteria (VSIC)	Finite VSIC for 5 Meter Source Thickness	Finite VSIC for 2 Meter Source Thickness	Particulate Soil Inhalation Criteria	Direct Contact Criteria	Soil Saturation Concentration Screening Levels
N-Methyl-morpholine (I)	109024	NA	400	1,100	NA	NLV	NLV	NLV	NLV	ID	2.00E+06	1.10E+08
Methyl parathion	298000	NA	46	130	NA	NLV	NLV	NLV	NLV	ID	1.80E+05	NA
4-Methyl-2-pentanone (MIBK) (I)	108101	NA	36,000	1.00E+05	ID	6.9E+7 (C)	5.30E+07	5.30E+07	7.00E+07	6.00E+10	1.8E+8 (C)	2.70E+06
Methyl-tert-butyl ether (MTBE)	1634044	NA	800	800	1.4E+5 (X)	1.8E+7 (C)	3.00E+07	4.10E+07	8.90E+07	8.80E+10	7.1E+6 (C)	5.90E+06
Methylcyclopentane (I)	96377	NA	ID	ID	NA	1.70E+05	2.80E+06	8.30E+06	2.00E+07	2.10E+10	ID	3.50E+05
4,4'-Methylene-bis-2-chloroaniline	101144	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	1.10E+08	32,000	NA
Methylene chloride	75092	NA	100	100	30,000 (X)	2.40E+05	7.00E+05	1.70E+06	4.00E+06	8.30E+09	5.8E+6 (C)	2.30E+06
2-Methylnaphthalene	91576	NA	57,000	1.70E+05	4,200	4.90E+06	1.80E+06	1.80E+06	1.80E+06	2.90E+08	2.60E+07	NA
Methylphenols (J)	1319773	NA	7,400	20,000	1,000 (M); 600	NLV	NLV	NLV	NLV	2.90E+09	3.60E+07	NA
Metolachlor	51218452	NA	4,800	20,000	300	NLV	NLV	NLV	NLV	ID	6.9E+6 (C,DD)	4.40E+05
Metribuzin	21087649	NA	3,600	10,000	NA	ID	ID	ID	ID	ID	2.80E+07	NA
Mirex	2385855	NA	NLL	NLL	NLL	ID	ID	ID	ID	ID	40,000	NA
Molybdenum (B)	7439987	NA	1,500	4,200	64,000 (X)	NLV	NLV	NLV	NLV	ID	9.60E+06	NA
Naphthalene	91203	NA	35,000	1.00E+05	730	4.70E+05	3.50E+05	3.50E+05	3.50E+05	8.80E+07	5.20E+07	NA
Nickel (B)	7440020	20,000	1.00E+05	1.00E+05	(G)	NLV	NLV	NLV	NLV	1.60E+07	1.50E+08	NA
Nitrate (B,N)	14797558	NA	2.0E+5 (N)	2.0E+5 (N)	ID	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrite (B,N)	14797650	NA	20,000 (N)	20,000 (N)	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Nitrobenzene (I)	98953	NA	330 (M); 68	330 (M); 190	3,600 (X)	1.70E+05	64,000	64,000	64,000	2.10E+07	3.40E+05	4.90E+05
2-Nitrophenol	88755	NA	400	1,200	ID	NLV	NLV	NLV	NLV	ID	2.00E+06	NA
n-Nitroso-di-n-propylamine	621647	NA	330 (M); 100	330 (M); 100	NA	NLV	NLV	NLV	NLV	2.00E+06	5,400	1.50E+06
N-Nitrosodiphenylamine	86306	NA	5,400	22,000	NA	NLV	NLV	NLV	NLV	2.80E+09	7.80E+06	NA
Oxamyl	23135220	NA	4,000	4,000	NA	NLV	NLV	NLV	NLV	ID	2.80E+07	NA
Oxo-hexyl acetate	88230357	NA	1,500	4,200	NA	ID	ID	ID	ID	2.40E+09	7.30E+06	1.00E+07
Pendimethalin	40487421	NA	1.10E+06	1.10E+06	NA	NLV	NLV	NLV	NLV	ID	1.30E+08	NA
Pentachlorobenzene	608935	NA	29,000	81,000	9,500	ID	ID	ID	ID	ID	9.3E+5 (C)	1.90E+05
Pentachloronitrobenzene	82688	NA	37,000	37,000	NA	2.20E+05	2.80E+05	2.80E+05	2.80E+05	1.50E+08	5.50E+06	NA

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Pentachlorophenol	87865	NA	22	22	(G,X)	NLV	NLV	NLV	NLV	1.30E+08	3.20E+05	NA
Pentane	109660	NA	ID	ID	NA	1.80E+05	4.40E+07	3.40E+08	6.00E+08	5.30E+11	ID	2.40E+05
2-Pentene (I)	109682	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	2.20E+05
Phenanthrene	85018	NA	56,000	1.60E+05	2,100	5.10E+06	1.90E+05	1.90E+05	1.90E+05	2.90E+06	5.20E+06	NA
Phenol	108952	NA	88,000	2.60E+05	9,000	NLV	NLV	NLV	NLV	1.80E+10	2.3E+8 (C,DD)	1.20E+07
Phenytoin	57410	NA	830	3300	4300 (X)	NLV	NLV	NLV	NLV	2.80E+08	4.80E+05	NA
Phosphorus (Total)	7723140	NA	1.30E+06	4.80E+06	(EE)	NLV	NLV	NLV	NLV	2.90E+07	1.0E+9 (D)	NA
Phthalic acid	88993	NA	2.80E+05	8.00E+05	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (C,D)	1.70E+06
Phthalic anhydride	85449	NA	3.00E+05	8.80E+05	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (C,D)	1.10E+06
Picloram	1918021	NA	10,000	10,000	920	NLV	NLV	NLV	NLV	ID	5.10E+07	NA
Piperidine	110894	NA	64	180	NA	NLV	NLV	NLV	NLV	4.10E+09	3.20E+05	1.20E+08
Polybrominated biphenyls (J)	67774327	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	ID	4,800	NA
Polychlorinated biphenyls (PCBs) (J,T)	1336363	NA	NLL	NLL	NLL	1.60E+07	8.10E+05	2.80E+07	2.80E+07	6.50E+06	(T)	NA
Prometon	1610180	NA	4,900	14,000	NA	NLV	NLV	NLV	NLV	ID	1.60E+07	NA
Propachlor	1918167	NA	1,900	5,400	NA	NLV	NLV	NLV	NLV	ID	9.50E+06	NA
Propazine	139402	NA	4,000	11,000	NA	NLV	NLV	NLV	NLV	ID	2.00E+07	NA
Propionic acid	79094	NA	2.40E+05	7.00E+05	ID	NLV	NLV	NLV	NLV	8.80E+09	1.0E+9 (C,D)	1.10E+08
Propyl alcohol (I)	71238	NA	28,000	80,000	NA	NLV	NLV	NLV	NLV	2.10E+10	7.4E+7 (DD)	1.10E+08
n-Propylbenzene (I)	103651	NA	1,600	4,600	ID	ID	ID	ID	ID	5.90E+08	8.00E+06	1.00E+07
Propylene glycol	57556	NA	3.00E+06	8.40E+06	5.80E+06	NLV	NLV	NLV	NLV	1.80E+11	1.0E+9 (C,D)	1.10E+08
Pyrene	129000	NA	4.80E+05	4.80E+05	ID	1.0E+9 (D)	7.80E+08	7.80E+08	7.80E+08	2.90E+09	8.40E+07	NA
Pyridine (I)	110861	NA	400	420	NA	2,000	9,800	40,000	97,000	1.00E+08	7.3E+5 (C)	37,000
Selenium (B)	7782492	410	4,000	4,000	400	NLV	NLV	NLV	NLV	5.90E+07	9.60E+06	NA
Silver (B)	7440224	1,000	4,500	13,000	100 (M); 27	NLV	NLV	NLV	NLV	2.90E+06	9.00E+06	NA
Silvex (2,4,5-TP)	93721	NA	3,600	3,600	2,200	NLV	NLV	NLV	NLV	ID	5.50E+06	NA
Simazine	122349	NA	80	80	340	NLV	NLV	NLV	NLV	ID	3.80E+06	NA
Sodium	17341252	NA	4.60E+06	7.00E+06	NA	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA

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Sodium azide	26628228	NA	1,800	5,000	1,000	ID	ID	ID	ID	ID	6.70E+06	NA
Strontium (B)	7440246	NA	92,000	2.60E+05	4.20E+05	NLV	NLV	NLV	NLV	ID	1.0E+9 (D)	NA
Styrene	100425	NA	2,700	2,700	2,100 (X)	1.3E+6 (C)	3.30E+06	3.30E+06	4.20E+06	6.90E+09	1.9E+6 (C)	5.20E+05
Sulfate	14808798	NA	5.00E+06	5.00E+06	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Tebuthiuron	34014181	NA	10,000	30,000	NA	NLV	NLV	NLV	NLV	ID	2.7E+7 (DD)	NA
2,3,7,8-Tetrabromodibenzo-p-dioxin (O)	50585416	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	(O)	(O)	NA
1,2,4,5-Tetrachlorobenzene	95943	NA	1.50E+06	1.50E+06	3,400 (X)	1.10E+06	2.70E+05	2.70E+05	2.70E+05	2.90E+07	2.50E+08	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (O)	1746016	NA	NLL	NLL	NLL	NLV	NLV	NLV	NLV	59 (O)	0.99 (O)	NA
1,1,1,2-Tetrachloroethane	630206	NA	1,500	6,400	ID	33,000	1.20E+05	2.10E+05	3.30E+05	5.30E+08	2.2E+6 (C)	4.40E+05
1,1,2,2-Tetrachloroethane	79345	NA	170	700	1,600 (X)	23,000	34,000	34,000	34,000	6.80E+07	2.40E+05	8.70E+05
Tetrachloroethylene	127184	NA	100	100	1,200 (X)	21,000	2.10E+05	4.90E+05	1.10E+06	1.20E+09	9.3E+5 (C)	88,000
Tetrahydrofuran	109999	NA	1,900	5,400	2.2E+5 (X)	2.40E+06	1.50E+07	6.70E+07	1.60E+08	1.70E+11	9.50E+06	1.20E+08
Tetranitromethane	509148	NA	ID	ID	NA	600	500 (M); 180	ID	ID	2.60E+05	ID	ID
Thallium (B)	7440280	NA	2,300	2,300	4,200 (X)	NLV	NLV	NLV	NLV	5.90E+06	1.30E+05	NA
Toluene (I)	108883	NA	16,000	16,000	5,400	6.1E+5 (C)	3.30E+06	3.60E+07	3.60E+07	1.20E+10	1.6E+8 (C)	2.50E+05
p-Toluidine	106490	NA	660 (M); 300	1,200	NA	NLV	NLV	NLV	NLV	1.30E+08	4.30E+05	1.20E+06
Toxaphene	8001352	NA	24,000	24,000	8,200	NLV	NLV	NLV	NLV	1.20E+07	85,000	NA
Triallate	2303175	NA	95,000	2.7E+5 (C)	NA	ID	ID	ID	ID	ID	9.5E+6 (C)	2.50E+05
Tributylamine	102829	NA	7,800	23,000	ID	1.10E+06	7.20E+05	7.20E+05	7.20E+05	2.10E+08	2.60E+06	3.70E+06
1,2,4-Trichlorobenzene	120821	NA	4,200	4,200	5,900 (X)	1.8E+7 (C)	3.40E+07	3.40E+07	3.40E+07	1.10E+10	5.8E+6 (C,DD)	1.10E+06
1,1,1-Trichloroethane	71556	NA	4,000	4,000	1,800	4.60E+05	4.50E+06	1.50E+07	3.10E+07	2.90E+10	1.0E+9 (C,D)	4.60E+05
1,1,2-Trichloroethane	79005	NA	100	100	6,600 (X)	24,000	57,000	57,000	1.20E+05	2.50E+08	8.40E+05	9.20E+05
Trichloroethylene	79016	NA	100	100	4,000 (X)	1,900	14,000	25,000	58,000	5.90E+07	6.6E+5 (C,DD)	5.00E+05
Trichlorofluoromethane	75694	NA	52,000	1.50E+05	NA	5.1E+6(C)	1.10E+08	1.40E+11	1.40E+11	1.70E+12	2.6E+8 (C)	5.60E+05
2,4,5-Trichlorophenol	95954	NA	39,000	1.10E+05	NA	NLV	NLV	NLV	NLV	1.00E+10	7.30E+07	NA
2,4,6-Trichlorophenol	88062	NA	2,400	9,400	330 (M); 100	NLV	NLV	NLV	NLV	1.30E+09	3.30E+06	NA

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1,2,3-Trichloropropane	96184	NA	840	2,400	NA	7,500	11,000	11,000	12,000	8.80E+06	4.2E+6 (C)	8.30E+05
1,1,2-Trichloro-1,2,2-trifluoroethane	76131	NA	9.0E+6 (C)	9.0E+6 (C)	1,700	9.3E+6 (C)	2.10E+08	8.90E+08	2.10E+09	2.30E+12	1.0E+9 (C,D)	5.50E+05
Triethanolamine	102716	NA	74,000	2.00E+05	NA	NLV	NLV	NLV	NLV	1.50E+09	3.6E+8 (C)	1.10E+08
Triethylene glycol	112276	NA	86,000	2.4E+5 (C)	NA	NLV	NLV	NLV	NLV	ID	2.3E+8 (C,DD)	1.10E+05
3-Trifluoromethyl-4-nitrophenol	88302	NA	1.10E+05	3.10E+05	NA	NLV	NLV	NLV	NLV	ID	2.4E+8 (DD)	NA
Trifluralin	1582098	NA	1.90E+05	5.70E+05	NA	ID	ID	ID	ID	ID	5.70E+06	NA
2,2,4-Trimethyl pentane	540841	NA	ID	ID	NA	2.0E+5 (C)	6.30E+06	4.00E+07	9.60E+07	1.00E+11	ID	19,000
2,4,4-Trimethyl-2-pentene (I)	107404	NA	ID	ID	NA	ID	ID	ID	ID	ID	ID	56,000
1,2,4-Trimethylbenzene (I)	95636	NA	2,100	2,100	570	8.0E+6 (C)	2.50E+07	6.00E+08	6.00E+08	3.60E+10	1.0E+8 (C)	1.10E+05
1,3,5-Trimethylbenzene (I)	108678	NA	1,800	1,800	1,100	4.8E+6 (C)	1.90E+07	4.60E+08	4.60E+08	3.60E+10	1.0E+8 (C)	94,000
Triphenyl phosphate	115866	NA	1.5E+6 (C)	1.8E+6 (C)	NA	NLV	NLV	NLV	NLV	ID	1.2E+8 (C)	1.10E+05
tris(2,3-Dibromopropyl)phosphate	126727	NA	930	930	ID	4.3E+5 (C)	60,000	60,000	60,000	7.40E+06	20,000	27,000
Urea	57136	NA	ID	ID	NA	NLV	NLV	NLV	NLV	ID	ID	NA
Vanadium	7440622	NA	72,000	9.90E+05	4.30E+05	NLV	NLV	NLV	NLV	ID	5.5E+6 (DD)	NA
Vinyl acetate (I)	108054	NA	13,000	36,000	NA	1.50E+06	2.00E+06	2.70E+06	5.90E+06	5.90E+09	3.4E+7 (C,DD)	2.40E+06
Vinyl chloride	75014	NA	40	40	260 (X)	2,800	29,000	1.70E+05	4.20E+05	8.90E+08	34,000	4.90E+05
White phosphorus (R)	12185103	NA	2.2	6	NA	NLV	NLV	NLV	NLV	ID	17,000 (DD)	NA
Xylenes (I)	1330207	NA	5,600	5,600	820	1.2E+7 (C)	5.40E+07	6.50E+07	1.30E+08	1.30E+11	1.0E+9 (C,D)	1.50E+05
Zinc (B)	7440666	47,000	2.40E+06	5.00E+06	(G)	NLV	NLV	NLV	NLV	ID	6.30E+08	NA

DEQ

R 299.49 FOOTNOTES FOR GENERIC CLEANUP CRITERIA TABLES
Cleanup Criteria Requirements for Response Activity (formerly the Part 201 Generic Cleanup Criteria and Screening Levels)

Effective Date December 30, 2013

COVER PAGE

R 299.49 Footnotes for generic cleanup criteria tables.

Rule 49. (1) The footnotes that apply to the generic criteria tables in R 299.44, R 299.46, and R 299.48 are as follows:

(A) Criterion is the state of Michigan drinking water standard established pursuant to Section 5 of 1976 PA 399, MCL 325.1005.

(B) Background, as defined in R 299.1(b), may be substituted if higher than the calculated cleanup criterion. Background levels may be less than criteria for some inorganic compounds.

(C) The criterion developed under R 299.20 to R 299.26 exceeds the chemical-specific soil saturation screening level (C_{sat}). The person proposing or implementing response activity shall document whether additional response activity is required to control free-phase liquids or NAPL to protect against risks associated with free-phase liquids by using methods appropriate for the free-phase liquids present. Development of a site-specific C_{sat} or methods presented in R 299.22, R 299.24(5), and R 299.26(8) may be conducted for the relevant exposure pathways.

(D) Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

(E) Criterion is the aesthetic drinking water value, as required by Section 20120a(5) of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA). A notice of aesthetic impact may be employed as an institutional control mechanism if groundwater concentrations exceed the aesthetic drinking water criterion, but do not exceed the applicable health-based drinking water value provided in the following table:

Hazardous Substance	Chemical Abstract Service Number	Residential Health-Based Drinking Water Value	Non-Residential Health-Based Drinking Water Value
Aluminum	7429905	300	4,100
tertiary Amyl methyl ether	994058	910	2,600
Copper	7440508	1,400	4,000
Diethyl ether	60297	3,700	10,000
Ethylbenzene	100414	700	700
Iron	7439896	2,000	5,600
Manganese	7439965	860	2,500
Methyl-tert-butyl ether (MTBE)	1634044	240	690
Toluene	108883	1,000	1,000
1,2,4-Trimethylbenzene	95636	1,000	2,900
1,3,5-Trimethylbenzene	108678	1,000	2,900
Xylenes	1330207	10,000	10,000

(F) Criterion is based on adverse impacts to plant life and phytotoxicity.

(G) Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness

of the receiving surface water. Where water hardness exceeds 400 mg $CaCO_3$/L, use 400 mg $CaCO_3$/L for the FCV calculation. The FCV formula provides values in units of ug/L or ppb. The generic GSI criterion is the lesser of the calculated FCV, the wildlife value (WV), and the surface water human non-drinking water value (HNDV). The soil GSI protection criteria for these hazardous substances are the greater of the 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote.

Hazardous Substance	FCV Formula ug/L	FCV Conversion Factor (CF)	WV ug/L	HNDV ug/L
Acetate	EXP(0.2732*(pH) + 7.0362)	NA	NA	1.3E+6
Acetic Acid	EXP(0.2732*(pH) + 7.0362)	NA	NA	1.3E+6
Barium	EXP(1.0629*(LnH)+1.1869)	NA	NA	1.6E+5
Beryllium	EXP(2.5279*(LnH)-10.7689)	NA	NA	1,200
Cadmium⊗	(EXP(0.7852*(LnH)-2.715))*CF	1.101672-((LnH)*(0.041838))	NA	130
Chromium (III) ⊗	(EXP(0.819*(LnH)+0.6848))*CF	0.86	NA	9,400
Copper	(EXP(0.8545*(LnH)-1.702))*CF	0.96	NA	38,000
Lead⊗	(EXP(0.9859*(LnH)-1.270))*CF	1.46203-((LnH)*(0.14571))	NA	190
Manganese⊗	EXP(0.8784*(LnH)+3.5385)	NA	NA	59,000
Nickel	(EXP(0.846*(LnH)+0.0584))*CF	0.997	NA	2.1E+5
Pentachlorophenol⊗	EXP(1.005*(pH)-5.134)	NA	NA	2.8
Zinc	(EXP(0.8473*(LnH)+0.884))*CF	0.986	NA	16,000

Where,

EXP(x) = The base of the natural logarithm raised to power x (e^x).

LnH = The natural logarithm of water hardness in mg $CaCO_3$/L.

* = The multiplication symbol.

⊗ = The GSI criterion developed here may not be protective for surface water that is used as a drinking water source. Refer to footnote (X) for further guidance.

A spreadsheet that may be used to calculate GSI and GSI protection criteria for (G)-footnoted hazardous substances is available on the Department of Environmental Quality (DEQ) internet web site.

(H) Valence-specific chromium data (Cr III and Cr VI) shall be compared to the corresponding valence-specific cleanup criteria. If both Cr III and Cr VI are present in groundwater, the total concentration of both cannot exceed the drinking water criterion of 100 ug/L. If analytical data are provided for total chromium only, they shall be compared to the cleanup criteria for Cr VI. Cr III soil cleanup criterion for protection of drinking water can only be used at sites where groundwater is prevented from being used as a public water supply, currently and in the future, through an approved land or resource use restriction.

(I) Hazardous substance may exhibit the characteristic of ignitability as defined in 40 C.F.R. §261.21 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of $45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, Remediation and Redevelopment Division (RRD), 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(J) Hazardous substance may be present in several isomer forms. Isomer-specific concentrations shall be added together for comparison to criteria.

(K) Hazardous substance may be flammable or explosive, or both.

(L) Criteria for lead are derived using a biologically based model, as allowed for under Section 20120a(9) of the NREPA, and are not calculated using the algorithms and assumptions specified in pathway-specific rules. The generic residential drinking water criterion of 4 ug/L is linked to the generic residential soil direct contact criterion of 400 mg/kg. A higher concentration in the drinking water, up to the state action level of 15 ug/L, may be allowed as a site-specific remedy and still allow for drinking water use, under Section 20120a(2) and 20120b of the NREPA if soil concentrations are appropriately lower than 400 mg/kg. If a site-specific criterion is approved based on this subdivision, a notice shall be filed on the deed for all property where the groundwater concentrations will exceed 4 ug/L to provide notice of the potential for unacceptable risk if soil or groundwater concentrations increase. Acceptable combinations of site-specific soil and drinking water concentrations are presented in the following table:

Acceptable Combinations of Lead in Drinking Water and Soil

Drinking Water Concentration (ug/L)	Soil Concentration (mg/kg)
5	386-395
6	376-385
7	376-385
8	366-375
9	356-365
10	346-355
11	336-345
12	336-345
13	326-335
14	316-325
15	306-315

(M) Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

(N) The concentrations of all potential sources of nitrate-nitrogen (e.g., ammonia-N, nitrite-N, nitrate-N) in groundwater that is used as a source of drinking water shall not, when added together, exceed the nitrate drinking water criterion of 10,000 ug/L. Where leaching to groundwater is a relevant pathway, soil concentrations of all potential sources of nitrate-nitrogen shall not, when added together, exceed the nitrate drinking water protection criterion of 2.0E+5 ug/kg.

(O) The concentration of all polychlorinated and polybrominated dibenzodioxin and dibenzofuran isomers present at a facility, expressed as an equivalent concentration of 2,3,7,8-tetrachlorodibenzo-p-dioxin based upon their relative potency, shall be added together and compared to the criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin. The generic cleanup criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin are not calculated according to the algorithms presented in R 299.14 to R 299.26. The generic cleanup criteria are being held at the values that the DEQ has used since August 1998, in recognition of the fact that national efforts to reassess risks posed by dioxin are not yet complete. Until these studies are complete, it is premature to select a revised slope factor and/or reference dose for calculation of generic cleanup criteria.

(P) Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria. Total cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with soil criteria. Nonresidential direct contact criteria may not be protective of the potential for release of hydrogen cyanide gas. Additional land or resource use restrictions may be necessary to protect for the acute inhalation concerns associated with hydrogen cyanide gas.

(Q) Criteria for carcinogenic polycyclic aromatic hydrocarbons were developed using relative potential potencies to benzo(a)pyrene.

(R) Hazardous substance may exhibit the characteristic of reactivity as defined in 40 C.F.R. §261.23 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of $45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(S) Criterion defaults to the hazardous substance-specific water solubility limit.

(T) Refer to the federal Toxic Substances Control Act (TSCA), 40 C.F.R. §761, Subpart D and 40 C.F.R. §761, Subpart G, to determine the applicability of TSCA cleanup standards. Subpart D and Subpart G of 40 C.F.R. §761 (July 1, 2001) are adopted by reference in these rules and are available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulations may be purchased, at a cost as of the time of adoption of these rules of $55, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401, or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost. Alternatives to compliance with the TSCA standards listed below

are possible under 40 C.F.R. §761 Subpart D. New releases may be subject to the standards identified in 40 C.F.R. §761, Subpart G. Use Part 201 soil direct contact cleanup criteria in the following table if TSCA standards are not applicable.

Land Use Category	TSCA, Subpart D Cleanup Standards	Part 201 Soil Direct Contact Cleanup Criteria
Residential	1,000 ppb, or 10,000 ppb if capped	4,000 ppb
Nonresidential	1,000 ppb, or 10,000 ppb if capped	16,000 ppb

(U) Hazardous substance may exhibit the characteristic of corrosivity as defined in 40 C.F.R. §261.22 (revised as of July 1, 2001), which is adopted by reference in these rules and is available for inspection at the DEQ, 525 West Allegan Street, Lansing, Michigan. Copies of the regulation may be purchased, at a cost as of the time of adoption of these rules of $45, from the Superintendent of Documents, Government Printing Office, Washington, DC 20401 (stock number 869-044-00155-1), or from the DEQ, RRD, 525 West Allegan Street, Lansing, Michigan 48933, at cost.

(V) Criterion is the aesthetic drinking water value as required by Section 20120(a)(5) of the NREPA. Concentrations up to 200 ug/L may be acceptable, and still allow for drinking water use, as part of a site-specific cleanup under Section 20120a(2) and 20120b of the NREPA.

(W) Concentrations of trihalomethanes in groundwater shall be added together to determine compliance with the Michigan drinking water standard of 80 ug/L. Concentrations of trihalomethanes in soil shall be added together to determine compliance with the drinking water protection criterion of 1,600 ug/kg.

(X) The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source. For a groundwater discharge to the Great Lakes and their connecting waters or discharge in close proximity to a water supply intake in inland surface waters, the generic GSI criterion shall be the surface water human drinking water value (HDV) listed in the table in this footnote, except for those HDV indicated with an asterisk. For HDV with an asterisk, the generic GSI criterion shall be the lowest of the HDV, the WV, and the calculated FCV. See formulas in footnote (G). Soil protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria based on the HDV shall be as listed in the table in this footnote, except for those values with an asterisk. Soil GSI protection criteria for compounds with an asterisk shall be the greater of 20 times the GSI criterion or the GSI soil-water partition values using the GSI criteria developed with the procedure described in this footnote.

Hazardous Substance	Chemical Abstract Service Number	Surface Water Human Drinking Water Values (HDV) (ug/L)	Soil GSI Protection Criteria for HDV (ug/kg)
Acrylamide	79061	0.5 (M); 0.12	10
Alachlor	15972608	3.5	88
Antimony	7440360	2.0 (M); 1.7	1,200
Benzene	71432	12	240
Boron	7440428	4,000	80,000
Bromate	15541454	10 (M); 0.5	200
n-Butanol	71363	3,500	70,000
Butyl benzyl phthalate	85687	6.9	13,000
Cadmium	7440439	2.5*	*
Carbon tetrachloride	56235	5.6	110
Chloride	16887006	50,000	1.0E+6
Chloroethane	75003	170	3,400
Chromium (III)	16065831	120*	*
Cyanazine	21725462	2.0 (M); 0.93	200 (M); 40
1,2-Dichloroethane	107062	6.0	120
trans-1,2-Dichloroethylene	156605	470	9,400
1,2-Dichloropropane	78875	9.1	180
1,3-Dichloropropene	542756	3.3	100 (M); 66
N,N-Dimethylacetamide	127195	700	14,000
1,4-Dioxane	123911	34	680
Ethylene dibromide	106934	0.17	20 (M); 3.4
Ethylene glycol	107211	56,000	1.1E+6
Hexachloroethane	67721	5.3	310
Isophorone	78591	310	6,200
Isopropyl alcohol	67630	28,000	5.6E+5
Lead	7439921	14*	*
Manganese	7439965	1,300*	*
Methanol	67561	14,000	2.8E+5
Methyl-tert-butyl ether (MTBE)	1634044	100	2,000
Methylene chloride	75092	47	940
Molybdenum	7439987	120	2,400
Nitrobenzene	98953	4.7	330 (M); 94
Pentachlorophenol	87865	1.8*	*
Styrene	100425	20	530
1,2,4,5-Tetrachlorobenzene	95943	2.8	3,300
1,1,2,2-Tetrachloroethane	79345	3.2	64
Tetrachloroethylene	127184	11	220
Tetrahydrofuran	109999	350	7,000
Thallium	7440280	2.0 (M); 1.2	1,400
1,2,4-Trichlorobenzene	120821	80	4,700
1,1,2-Trichloroethane	79005	12	240
Trichloroethylene	79016	29	580
Vinyl chloride	75014	1.0 (M); 0.25	40 (M); 20

(Y) Source size modifiers shown in the following table shall be used to determine soil inhalation criteria for ambient air when the source size is not one-half acre. The modifier shall be multiplied by the generic soil inhalation criteria shown in the table of generic cleanup criteria to determine the applicable criterion. See Footnote (C).

Source Size sq. feet or acres	Modifier
400 sq feet	3.17
1000 sq feet	2.2
2000 sq feet	1.76
1/4 acre	1.15
1/2 acre	1
1 acre	0.87
2 acre	0.77
5 acre	0.66
10 acre	0.6
32 acre	0.5
100 acre	0.43

(Z) Mercury is typically measured as total mercury. The generic cleanup criteria, however, are based on data for different species of mercury. Specifically, data for elemental mercury, chemical abstract service (CAS) number 7439976, serve as the basis for the soil volatilization to indoor air criteria, groundwater volatilization to indoor air, and soil inhalation criteria. Data for methyl mercury, CAS number 22967926, serve as the basis for the GSI criterion; and data for mercuric chloride, CAS number 7487947, serve as the basis for the drinking water, groundwater contact, soil direct contact, and the groundwater protection criteria. Comparison to criteria shall be based on species-specific analytical data only if sufficient facility characterization has been conducted to rule out the presence of other species of mercury.

(AA) Use 10,000 ug/l where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 ug/l for all other uses.

(BB) The state drinking water standard for asbestos (fibers greater than 10 micrometers in length) is in units of a million fibers per liter of water (MFL). Soil concentrations of asbestos are determined by polarized light microscopy.

(CC) Groundwater: The generic GSI criteria are based on the toxicity of unionized ammonia (NH_3); the criteria are 29 ug/L and 53 ug/L for cold water and warm water surface water, respectively. As a result, the GSI criterion shall be compared to the percent of the total ammonia concentration in the groundwater that will become NH_3 in the surface water. This percent NH_3 is a function of the pH and temperature of the receiving surface water and can be estimated using the following table, taken from Emerson, et al., (Journal of the Fisheries Research Board of Canada, Volume 32(12):2382, 1975).

Percent NH_3 in Aqueous Ammonia Solutions for 0-30 °C and pH 6-10

Temp (°F)	Temp (°C)	pH 6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0
32.0	0	0.00827	0.0261	0.0826	0.261	0.820	2.55	7.64	20.7	45.3
33.8	1	0.00899	0.0284	0.0898	0.284	0.891	2.77	8.25	22.1	47.3
35.6	2	0.00977	0.0309	0.0977	0.308	0.968	3.00	8.90	23.6	49.4
37.4	3	0.0106	0.0336	0.106	0.335	1.05	3.25	9.60	25.1	51.5
39.2	4	0.0115	0.0364	0.115	0.363	1.14	3.52	10.3	26.7	53.5
41.0	5	0.0125	0.0395	0.125	0.394	1.23	3.80	11.1	28.3	55.6
42.8	6	0.0136	0.0429	0.135	0.427	1.34	4.11	11.9	30.0	57.6
44.6	7	0.0147	0.0464	0.147	0.462	1.45	4.44	12.8	31.7	59.5
46.4	8	0.0159	0.0503	0.159	0.501	1.57	4.79	13.7	33.5	61.4
48.2	9	0.0172	0.0544	0.172	0.542	1.69	5.16	14.7	35.3	63.3
50.0	10	0.0186	0.0589	0.186	0.586	1.83	5.56	15.7	37.1	65.1
51.8	11	0.0201	0.0637	0.201	0.633	1.97	5.99	16.8	38.9	66.8
53.6	12	0.0218	0.0688	0.217	0.684	2.13	6.44	17.9	40.8	68.5
55.4	13	0.0235	0.0743	0.235	0.738	2.30	6.92	19.0	42.6	70.2
57.2	14	0.0254	0.0802	0.253	0.796	2.48	7.43	20.2	44.5	71.7
59.0	15	0.0274	0.0865	0.273	0.859	2.67	7.97	21.5	46.4	73.3
60.8	16	0.0295	0.0933	0.294	0.925	2.87	8.54	22.8	48.3	74.7
62.6	17	0.0318	0.101	0.317	0.996	3.08	9.14	24.1	50.2	76.1
64.4	18	0.0343	0.108	0.342	1.07	3.31	9.78	25.5	52.0	77.4
66.2	19	0.0369	0.117	0.368	1.15	3.56	10.5	27.0	53.9	78.7
68.0	20	0.0397	0.125	0.396	1.24	3.82	11.2	28.4	55.7	79.9
69.8	21	0.0427	0.135	0.425	1.33	4.10	11.9	29.9	57.5	81.0
71.6	22	0.0459	0.145	0.457	1.43	4.39	12.7	31.5	59.2	82.1
73.4	23	0.0493	0.156	0.491	1.54	4.70	13.5	33.0	60.9	83.2
75.2	24	0.0530	0.167	0.527	1.65	5.03	14.4	34.6	62.6	84.1
77.0	25	0.0569	0.180	0.566	1.77	5.38	15.3	36.3	64.3	85.1
78.8	26	0.0610	0.193	0.607	1.89	5.75	16.2	37.9	65.9	85.9
80.6	27	0.0654	0.207	0.651	2.03	6.15	17.2	39.6	67.4	86.8
82.4	28	0.0701	0.221	0.697	2.17	6.56	18.2	41.2	68.9	87.3
84.2	29	0.0752	0.237	0.747	2.32	7.00	19.2	42.9	70.4	88.3
86.0	30	0.0805	0.254	0.799	2.48	7.46	20.3	44.6	71.8	89.0

The generic approach for estimating NH_3 assumes a default pH of 8 and default temperatures of 68°F and 85°F for cold water and warm water surface water, respectively. The resulting percent NH_3 is 3.8 percent and 7.2 percent for cold water and warm water, respectively. This default percentage shall be multiplied by the total ammonia-nitrogen (NH_3-N) concentration in the groundwater and the resulting NH_3 concentration compared to the applicable GSI criterion. As an

alternative, the maximum pH and temperature data from the specific receiving surface water can be used to estimate, from the table in this footnote, a lower percent unionized ammonia concentration for comparison to the generic GSI.

Soil: The generic soil GSI protection criteria for unionized ammonia are 580 ug/kg and 1,100 ug/kg for cold water and warm water surface water, respectively.

(DD) Hazardous substance causes developmental effects. Residential direct contact criteria are protective of both prenatal and postnatal exposure. Nonresidential direct contact criteria are protective for a pregnant adult receptor.

(EE) The following are applicable generic GSI criteria as required by Section 20120e of the NREPA.

Hazardous Substance	GSI (ug/L)	Notes
Phosphorus	1,000	Criteria applicable unless receiving water is a surface water that has a phosphorus waste load allocation or is an inland lake. In those cases, contact the department for applicable values.
Total dissolved solids (TDS)	5.0E+5	If TDS data are not available, the TDS criterion may be used a screening level for the sum of the concentrations of the following substances: calcium, chlorides, iron, magnesium, potassium, sodium, sulfate.
Dissolved Oxygen (DO): Cold receiving waters Warm receiving waters	 ≥ 7,000 ≥ 5,000	Since a low level of DO can be harmful to aquatic life, the criterion represents a minimum level that on-site samples must exceed. This is in contrast to other criteria which represent "not to exceed" concentrations. DO criteria are not applicable if groundwater Carbonaceous Biochemical Oxygen Demand (CBOD) is less than 10,000 ug/L and groundwater ammonia concentration is less than 2,000 ug/L.

(FF) The chloride GSI criterion shall be 125 mg/l when the discharge is to surface waters of the state designated as public water supply sources or 50 mg/l when the discharge is to the Great Lakes or connecting waters. Chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source, however, the total dissolved solids criterion is applicable.

(GG) Risk-based criteria are not available for methane due to insufficient toxicity data. An acceptable soil gas concentration (presented for both residential and nonresidential land uses) was derived utilizing 25 percent of the lower explosive level for methane. This equates to 1.25 percent or 8.4E+6 ug/m^3.

(HH) The residential criterion for sodium is 230,000 ug/l in accordance with the Sodium Advisory Council recommendation and revised Groundwater Discharge Standards.

"ID" means insufficient data to develop criterion.

"NA" means a criterion or value is not available or, in the case of background and CAS numbers, not applicable.

"NLL" means hazardous substance is not likely to leach under most soil conditions.

"NLV" means hazardous substance is not likely to volatilize under most conditions.

R 299.50 Toxicological and chemical-physical properties.

Rule 50. (1) The toxicological and chemical-physical properties used to calculate generic shall be as shown in table 4, except as provided in section 20120a(9) of the act, R 299.49(1)(l) and R 299.49(1)(o).

(2) Abbreviations used in table 4 have the following meanings when used in this rule:

(a) "NA" means not available.

(b) "NR" means not relevant.

Appendix G

Qualifications Statement

MICHIGAN CONSULTING & ENVIRONMENTAL

RAYMOND BREGE

STAFF SCIENTIST

PROFILE

Mr. Brege has over 10 years of experience related to environmental consulting, including conducting Phase I through III site investigations, environmental due diligence, and investigation and remediation of underground storage tanks (UST) releases and UST removal. He has a broad knowledge of regulatory requirements, sampling techniques, project planning, applying Risk Based Corrective Action and technical reporting. He also holds an accredited Asbestos Building Inspector (BI) license with the State of Michigan.

SKILLS & ABILITIES

Mr. Brege has completed Phase I site assessments and conducted initial site characterization, planning and implementing of Phase II site investigations for numerous industrial/commercial facilities including field reconnaissance and investigation, regulatory data investigation (ASTM Radius Research), data management and interpretation and preparation of project diagrams, tables and reports.

PROJECT EXPERIENCE

- Assisted in performing hydrogeologic monitoring services for large industrial sites. Work included groundwater monitoring to obtain analytical data requirements under Part 115, Part 201 and /or Part 213.
- Conducted asbestos inspections of residential, commercial, industrial facilities and bridges.
- Managed and/or operated with teams of field technicians collecting groundwater samples using low flow sampling methods at several large industrial sites.
- Conducted investigation and remediation of underground storage tank (UST) releases and removal. Responsibilities included oversite of soil and tank removal, collecting soil, groundwater, and air samples, NAPL monitoring and recovery, and O&M of air sparge systems.
- Provided drafting and/or finalization for project reports (including but not limited to Phase I and II ESAs, BEAs, Due Care Plans, IARs, FARs, Closure Reports and Hydrogeologic Monitoring Reports (HMRs) under Part 115).
- Created site sketches, diagrams and aerial overlays from data and project manager notes. Diagrams included but not limited to Conceptual Site Models (CSMs), groundwater flow maps, site specific diagrams and cross-sectional diagrams.

EDUCATION

- ALPENA COMMUNITY COLLEGE, ASSOCIATES DEGREE IN LIBERAL ARTS WITH AN EMPHASIS ON FINE ARTS
- OSHA 29 CFR 1910.120 40-HOUR HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE (HAZWOPER) TRAINING
- OSHA29 CFR 1910.120 8-HOUR ANNUAL REFRESHER SAFETY TRAINING
- STATE OF MICHIGAN ACCREDITED ASBESTOS BUILDING INSPECTOR, A52433
- ASTM RISK-BASED CORRECTIVE ACTION (RBCA) APPLIED AT PETROLEUM RELEASE SITES

MICHIGAN CONSULTING & ENVIRONMENTAL

MARK ERICKSON

SENIOR PROJECT MANAGER

PROFILE

Mr. Erickson is a results-oriented Environmental Professional with over 30 years' experience in procurement, budget preparation, project management and financial and technical management of a diverse portfolio of environmental projects.

SKILLS & ABILITIES

Mr. Erickson has supervised or managed over 2,000 environmental projects including tank removal, well installation, subsurface investigation, water treatment design, installation and operation, soil and groundwater remediation, facility decontamination, demolition, and emergency response. Mr. Erickson has completed many Phase I and Phase II ESA's. He has performed or managed over 650 hydrogeological investigations at retail petroleum, industrial and commercial environments. Additionally, Mr. Erickson has a strong working knowledge of state and local regulations as well as RCRA, CERCLA and TSCA. Mr. Erickson has completed Kleinfelder's project management qualification system certification process.

PROJECT EXPERIENCE

- Managed due diligence activities associated with the purchase of 27 retail gasoline facilities. Managed and coordinated Phase I efforts on each of the 27 sites. Completed Phase II investigations on sites where existing site characterization data was not available. Managed and prepared Phase I and Phase II reports as well as developed a remedial strategy with associated cost for the project. Continued to work with the buyer after the purchase and developed a multi-year strategy to delineate the extent of petroleum affected soil and groundwater and remediated several of the sites during the UST upgrade phase of the project. Remedial options included excavation, soil vapor extraction and air sparge technologies.
- Managed sites for a major oil company. Projects typically involved the removal of out-of-date underground storage tanks (USTs) or the upgrading of out-of-compliance UST system components. If environmental impact was observed or documented using photoionization detectors or analytical laboratory data, the projects involved oversight and directing remedial activities to abate the source materials. Once the USTs were replaced, the projects involved the installation of monitoring wells was often completed to evaluate migration of impact. Remedial systems were designed (including pump and treat, air sparge and soil vapor extraction systems) and installed on the sites to address affected media.

EDUCATION

UNIVERSITY OF ARIZONA, BACHELOR OF SCIENCE IN GEOSCIENCES

BECKER JUNIOR COLLEGE, ASSOCIATE OF SCIENCE IN BUSINESS ADMINISTRATION

NORTHEASTERN UNIVERSITY, VARIOUS REGULATORY COURSES

Attachment VI

Limited Phase II ESA (1/2/2023)

McDowell & Associates

Geotechnical, Environmental & Hydrogeological Services • Materials Testing & Inspection

21355 Hatcher Avenue, Ferndale, MI 48220

Phone: (248) 399-2066 • Fax: (248) 399-2157

January 2, 2023

Ms. Bukurije Logu
1497 Walton Boulevard
Rochester Hills, Michigan 48309

Job No. 22-16348

Attention: Ms. Bukurije Logu

Subject: Limited Phase II Environmental Site Assessment
Approximate 32.49-Acre Parcel
1406 E. Avon Road
Rochester Hills, Oakland County, Michigan

Dear Ms. Logu,

Pursuant to your request, McDowell & Associates has completed a Limited Phase II Environmental Site Assessment (ESA) for the subject property. A Site Location Map, which shows the approximate location of the subject property, accompanies this report as Attachment I.

The purpose of this Limited Phase II ESA was to investigate fill on the subject property to support completion of a Baseline Environmental Assessment.

As part of this investigation, a total of six test pits were made and five soil samples, plus one duplicate soil sample, were obtained and submitted for chemical testing.

Results of chemical testing showed metals and PNAs in soil at concentrations above EGLE Generic Residential Criteria and EGLE Residential VIAP Screening Levels.

Test results indicate the subject property meets the definition of a "facility" under Part 201 of Michigan Public Act 451 and a Baseline Environmental Assessment could be performed. The "facility" owner and operator will have due care obligations. The scope of work for this Limited Phase II ESA was completed to support a new BEA. A supplemental investigation is required at the property to address due care.

This report was completed for the exclusive use of United Tech Construction LLC , and they may rely on its contents.

The results of our investigation are presented below.

Background

McDowell & Associates was retained on December 13, 2022 to complete a Phase II ESA for the subject property. It was indicated that a Phase I ESA was underway by others and anticipated to be completed on December 28, 2022.

Prior to completion of field work, McDowell & Associates reviewed in-house historical sources for the subject property including aerial photographs, topographic maps, the USDA Soil Survey, and a Baseline Environmental Assessment (BEA) for the west adjoining property. Also included in the BEA for the west adjoining property was a "Draft" Preliminary Soils Investigation prepared by McDowell & Associates for the subject property and the west adjoining property on April 6, 2004 (McDowell & Associates' Job No. 04-142).

As part of the "Draft" Preliminary Soils Investigation, McDowell & Associates witnessed 16 test pits and one hand auger boring on the property. Fourteen of the test pits (TP-1 through TP-7, TP-9 through TP-13, TP-16, and TP-17) were made on the subject property. The approximate locations in which test pits and soil borings were made are shown on the accompanying Soil Boring, Test Pit, and Sample Location Map.

Test pits made on the subject property encountered fill containing varying amounts of tree stumps and limbs, concrete, and general household refuse such as bottles to depths up to 12' underlain by brown, gray, and variegated sand with silt and gravel content. The Log of Test Pit Sheets from that investigation, are attached.

The scope of work for this Phase II ESA was completed to investigate fill on the subject property to support completion of a Baseline Environmental Assessment.

Previous Phase I ESA

McDowell & Associates was provided a copy of a Phase I ESA prepared by Michigan Consulting & Environmental, dated December 28, 2022. That Phase I ESA also referenced the BEA (including Phase I ESA and Phase II ESA) for the west adjoining property, the "Draft" Preliminary Soils Investigation by McDowell & Associates, and a Brownfield Redevelopment Assessment Report prepared by MDEQ [now EGLE] for the subject property and adjoining land to the west in 2011.

That report identified the following recognized environmental conditions in connection with the subject property:

1. "The listing of the Property as part of a parent parcel which was identified as a facility where contaminants above Part 201 CCRRA [cleanup criteria requirements for response activities] are known to exist from the Property's historical use as a woodfill, tree farm and reported dumping of household refuse …."

2. "The presence of a 55-gallon drum which was reported to have leaked an unknown liquid to the subsurface environment based on prior reports …."

3. "The listing of the east and southeast adjacent parcels as the former SOCRRA landfill and composting facility identified under multiple regulatory facility listings and their close proximity to the Property …."

4. "The listing of two LUST sites within the minimum prescribed search distance which were up gradient to the Property …."

5. "Due to the presence of several contaminants in the soil above multiple Part 201 CCRRA, a VEC [vapor encroachment condition] to future buildings and/or structures cannot be ruled out."

Field Work

On December 22, 2022, McDowell & Associates witnessed six test pits, designated 1 through 6, on the subject property. Test pit locations were biased to areas with known suspect fill. A Soil Boring, Test Pit, and Sample Location Map, which shows the approximate locations in which test pits were made, accompanies this report as Attachment II.

Subsurface conditions encountered in TP-2 through TP-6 generally consisted of sandy topsoil and sand fill with varying amounts of debris including glass, metal, brick, concrete, possible slag, tire, ceramic, and wood to depths up to 6' underlain by moist brown sand. No suspect fill was noted in TP-1. Subsurface conditions encountered at each test pit location are shown on the Log of Test Pit Sheets which are included as Attachment III.

Test pit spoils were screened with a MiniRAE 2000 photoionization detector (PID) to estimate the presence of volatile organic compound (VOC) vapors. No VOC vapors were detected with the PID.

Soil samples obtained as part of this assessment were placed in labeled, pre-cleaned jars and stored in an ice-chest until delivery to a representative of Merit Laboratories, Inc. of East Lansing, Michigan for chemical testing. Soil samples were preserved for VOC analyses in general accordance with EPA Method 5035A. Sample chain-of-custody documentation accompanies this report with chemical test results.

Chemical Testing Program

The following table summarizes sampling completed at the property as part of this Limited Phase II ESA.

Sample ID	Date	Matrix	Sample Depth	Chemical Testing Program
2a	12/22/2022	Soil	2'- 3'	10 MM, PNAs
2a-D	12/22/2022	Soil	Duplicate	10 MM, PNAs
3a	12/22/2022	Soil	2'- 3'	10MM, VOCs, PNAs, PCBs
3b	12/22/2022	Soil	5'- 6'	10MM, VOCs
4a	12/22/2022	Soil	1'- 2'	10MM, pesticides
5a	12/22/2022	Soil	0'- 1'	10MM, pesticides, PNAs, PCBs

VOCs- volatile organic compounds (Method 8260C- soil)
PNAs- polynuclear aromatic hydrocarbons (Method 8270D)

PCBs- polychlorinated biphenyls (Method 8082)
Pesticides- Method 8081
10MM- 10 Michigan Metals: arsenic, barium, cadmium chromium, copper, lead, selenium, silver, zinc (Method 6020) and mercury (Method 7471)

Chemical Test Results

The accompanying Tables 1 through 4 summarize chemical test results in comparison to current EGLE Generic Residential Criteria (December 2013) and EGLE Residential and Non-Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels (September 2020).

Individual chemical test results accompany this report as Attachment IV.

Metals

Arsenic was detected in 2a, 2a-D, 3a, and 4a and total lead was detected 2a-D, 3a, and 4a at concentrations above EGLE Statewide Default Background Levels and EGLE Generic Residential Direct Contact and Groundwater Protection Criteria. Fine and coarse fraction lead testing would be required to investigate total lead concentrations at 2a, 3b, and 5a.

Barium, cadmium, total chromium, copper, selenium, silver, and zinc were detected in some or all of soil samples 2a, 2a-D, 3a, 3b, and 4a above EGLE Statewide Default Background Levels and EGLE Generic Residential Groundwater Protection Criteria.

Total chromium was detected in 3a at a concentration above the EGLE Generic Residential Particulate Soil Inhalation Criterion for hexavalent chromium. Additional testing would be required to investigate the chromium type.

Mercury was detected in each of the soil samples above the Statewide Default Background Level, the EGLE Generic Residential GSI Groundwater Protection Criterion, and EGLE VIAP Screening Level.

Volatile Organic Compounds

2-Methylnaphthalene, naphthalene, toluene, and xylenes were detected in Soil Sample 3a at concentrations below EGLE Generic Residential Criteria. The detected concentration of naphthalene in 3a exceeds the EGLE Residential VIAP Screening Level.

p-Isopropyltoluene was detected in Soil Samples 3a and 3b at a concentration of 100 ug/kg. There are no published EGLE Generic Residential Criteria or EGLE VIAP Screening Levels for p-isopropyltoluene.

Polynuclear Aromatic Hydrocarbons

PNAs were detected in Soil Samples 2a, 2a-D, 3a, and 5a.

The detected concentrations of benzo(a)pyrene in 2a, 2a-D, and 3a exceed the EGLE Generic Residential Direct Contact Criterion.

The detected concentrations of fluoranthene in 2a and 3a exceed the EGLE Generic Residential Groundwater Surface Water Interface (GSI) Groundwater Protection Criterion.

The detected concentrations of phenanthene in 2a, 2a-D, and 3a exceed the EGLE Generic Residential GSI Groundwater Protection Criterion and the EGLE Residential VIAP Screening Level.

Polychlorinated Biphenyls

No PCBs were detected in Soil Sample 4a.

PCBs were detected in Soil Sample 4a, but at concentrations below EGLE Generic Residential Criteria. EGLE has not published Residential VIAP Screening Levels for PCBs. According to a Footnote, EGLE indicates insufficient physical chemical parameters to calculate a VIAP Screening Level for soil. "If detections are present in specified media, health-based soil vapor value should be used to evaluate risk."

Pesticides

The pesticides 4,4-DDD, 4,4-DDE, and/or 4,4-DDT were detected in Soil Samples 3a and 4a, but at concentrations below EGLE Generic Residential Criteria and EGLE Residential VIAP Screening Levels.

Limitations

McDowell & Associates was retained on December 13, 2022 to complete a Phase II ESA for the subject property. Work associated with this report was completed in a rapid manner with limited time to review existing data due to this late retention date. In order to meet the timeline for completion of a Baseline Environmental Assessment, field work was conducted prior to receipt of a Phase I ESA prepared by others on December 28, 2022. This timing had a negative effect on scope of work and data available from which to make recommendations.

No environmental assessment can eliminate uncertainty regarding the potential for recognized environmental conditions or the presence of contaminants in connection with a property. This environmental assessment is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with the property within reasonable limits of time and cost. The conclusions represent our professional opinion based upon information obtained during assessment procedures and may not represent those that would be made under other conditions.

Nothing in this report constitutes a legal opinion or legal advice. It is suggested that environmental counsel be retained to evaluate site conditions and transaction-related issues from a legal perspective.

Property lines shown on maps are estimates and are limited by scale inaccuracies. The approximate boundaries shown on report attachments are not intended to be exact, but rather approximations to assist with review.

Conclusions

McDowell & Associates has completed a Limited Phase II Environmental Site Assessment (ESA) for the subject property. The purpose of this Limited Phase II ESA was to investigate fill on the subject property to support completion of a Baseline Environmental Assessment.

As part of this investigation, a total of six test pits were made and five soil samples, plus one duplicate soil sample, were obtained and submitted for chemical testing.

Results of chemical testing showed metals and PNAs in soil at concentrations above EGLE Generic Residential Criteria and EGLE Residential VIAP Screening Levels.

Test results indicate the subject property meets the definition of a "facility" under Part 201 of Michigan Public Act 451 and a Baseline Environmental Assessment could be performed. The "facility" owner and operator will have due care obligations. The scope of work for this Limited Phase II ESA was completed to support a new BEA. A supplemental investigation is required at the property to address due care.

If you have any questions regarding the information contained in this report, or if we can be of further service, please do not hesitate to call.

Very truly yours,

McDOWELL & ASSOCIATES

Jennifer Lagerbohm, M.S., CHMM
Senior Industrial Hygienist

Douglas M. McDowell, M.S., P.E.
Vice President

JL/jl

Attachments

Table 1: Summary of Metals Chemistry Results (Soil)
Table 2: Summary of Detected SVOCs Chemistry Results (Soil)
Table 3: Summary of Detected VOCs Chemistry Results (Soil)
Table 4: Summary of Pesticides and PCBs Chemistry Results (Soil)

Attachment I- Site Location Map
Attachment II- Test Pit and Sample Location Map
Attachment III- Log of Test Pit Sheets
Attachment IV- Chemical Test Results with Chain-of-Custody Documentation

Table 1

Summary of Metals Chemistry Results (Soil)

McDowell Job No. 22-16348

JL 1/2/2023

TABLE 1 - SUMMARY OF METALS CHEMISTRY RESULTS (Soil)

Sample	Date	Description	Arsenic 7440382	Barium 7440393	Cadmium 7440439	Total Chromium 18540299	Copper 7440508
2a	12/22/2022	2'- 3'	**13.3**	**844**	**4.71**	**22.2**	**131**
2a-D	12/22/2022	duplicate	**13.9**	**727**	**6.86**	**19.8**	**494**
3a	12/22/2022	2'- 3'	**24.5**	**862**	**7.64**	**303**	**1,710**
3b	12/22/2022	5'- 6'	**6.88**	**271**	0.92	**8.86**	**69.4**
4a	12/22/2022	1'- 2'	**17.3**	**598**	**6.50**	**24.6**	**167**
5a	12/22/2022	0'- 1'	4.65	63.5	0.50	14.2	31.6
EGLE Statewide Default Background Levels			**5.8**	**75**	**1.2**	**18**	**32**
EGLE Generic Residential Groundwater Protection Criteria			**4.6/4.6**	**1,300/440(7)**	**6.0/3.6(7)**	**30/3.3**	**5,800/75(7)**
EGLE Generic Residential Particulate Soil Inhalation Criteria			**720**	**330,000**	**1,700**	**260**	**130,000**
EGLE Generic Non-Residential Particulate Soil Inhalation Criteria			**910**	**150,000**	**2,200**	**240**	**59,000**
EGLE Generic Residential Volatile Soil Inhalation Criteria (VSIC)			**NLV**	**NLV**	**NLV**	**NLV**	**NLV**
EGLE Generic Residential Direct Contact Criteria			**7.6**	**37,000**	**550**	**2,500**	**20,000**
EGLE Generic Non-Residential Direct Contact Criteria			**37**	**130,000**	**2,100**	**9,200**	**73,000**

Sample	Date	Description	Total Lead 7439921	Mercury 7439976	Selenium 7782492	Silver 7440224	Zinc 7440666
2a	12/22/2022	2'- 3'	**322**	**0.357**	**0.63**	**1.13**	**489**
2a-D	12/22/2022	duplicate	**999**	**0.323**	**1.01**	**2.31**	**723**
3a	12/22/2022	2'- 3'	**1,370**	**0.812**	**1.67**	**4.95**	**1,050**
3b	12/22/2022	5'- 6'	**270**	**0.228**	**0.60**	**1.62**	**215**
4a	12/22/2022	1'- 2'	**966**	**1.014**	**1.11**	**1.33**	**2,220**
5a	12/22/2022	0'- 1'	**164**	**0.183**	<0.40	<0.20	**124**
EGLE Statewide Default Background Levels			**21**	**0.13**	**0.41**	**1.0**	**47**
EGLE Residential Volatilizataion to Indoor Air Pathway (VIAP) Screening Level				**0.022**			
EGLE Generic Residential Groundwater Protection Criteria			**700/5,100(7)**	**1.7/0.05**	**4.0/0.4**	**4.5/0.1**	**2,400/169(7)**
EGLE Generic Residential Particulate Soil Inhalation Criteria			**100,000**	**52 (48-indoor)**	**130,000**	**6,700**	**ID**
EGLE Generic Non-Residential Particulate Soil Inhalation Criteria			**44,000**	**62 (89- indoor)**	**59,000**	**2,900**	**ID**
EGLE Generic Residential Volatile Soil Inhalation Criteria (VSIC)			**NLV**	**0.52**	**NLV**	**NLV**	**NLV**
EGLE Generic Residential Direct Contact Criteria			**400**	**160**	**2,600**	**2,500**	**170,000**
EGLE Generic Non-Residential Direct Contact Criteria			**900**	**580**	**9,600**	**9,000**	**630,000**

NOTES:

1. All values expressed in mg/kg
2. Michigan Department of Environment, Great Lakes, and Energy (EGLE) Generic Criteria from Table 2. Soil: Residential, and Table 3. Soil: Nonresidential. Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels," dated December 30, 2013.
   EGLE Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels, dated September 4, 2020.
3. Most rigorous of Ambient Air Criteria presented.
4. Groundwater Protection Criteria presented as Drinking Water/Ground Water Surface Water Interface (GSI)
5. Chemical Abstract Service (CAS) Numbers are presented below chemicals as provided by EGLE.
6. "ID" = EGLE indicates inadequate data to develop criterion.
7. EGLE indicates that some chemical-specific GSI criteria are based upon the hardness of the receiving waters, and for the purpose of evaluating the potential need for remedial activities, EGLE allows an estimated hardness value of 150 mg/L to be used. Final determination of compliance with criteria must be based on site specific hardness. The estimated GSI value shown is not protective of surface water used as a drinking water source.
8. Boldface values exceed EGLE Statewide Default Background Levels or Facility-Specific Background Levels.
9. Values shown thus **[ ]** exceed Statewide Default and EGLE Generic Residential Groundwater Protection Criteria.
10. Values shown thus **[ ]** exceed Statewide Default and EGLE Generic Residential Direct Contact Criteria.
11. "NT" = not tested.
12. Distinctive testing would be required to determine the relative concentrarions of chromium III and VI. For the purposes of this table chromium VI comparative criteria are used.

Table 2

Summary of Detected SVOCs Chemistry Results (Soil)

McDowell Job No. 22-16348
JL 1/2/2023

TABLE 2 - SUMMARY OF PNAs CHEMISTRY RESULTS (Soil

Sample	Date	Description	Acenaphthene 83329	Acenaphthylene 208968	Anthracene 120127	Benzo(a)anthracene 56553	Benzo(a)pyrene 50328	Benzo(b)fluoranthene 205992
2a	12/22/2022	2'- 3'	<300	<300	1,100	2,800	2,500	3,300
2a-D	12/22/2022	duplicate	<300	<300	700	2,000	2,000	3,600
3a	12/22/2022	2'- 3'	400	<300	1,600	3,900	3,300	6,200
5a	12/22/2022	0'- 1'	<300	<300	<300	700	700	1,100
EGLE Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels			**200,000**	**DATA**	**13,000,000**	**160,000**	**NA**	**NA**
EGLE Non-Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels			**3,600,000**	**DATA**	**220,000,000**	**11,000,000**	**NA**	**NA**
EGLE Generic Residential Groundwater Protection Criteria			**300,000/8,700**	**5,900/ID**	**41,000/ID**	**NLL/NLL**	**NLL/NLL**	**NLL/NLL**
EGLE Generic Residential Indoor Air Inhalation Criteria			**190,000,000**	**1,600,000**	**1,000,000,000**	**NLV**	**NLV**	**ID**
EGLE Generic Non-Residential Indoor Air Inhalation Criteria			**350,000,000**	**3,000,000**	**1,000,000,000**	**NLV**	**NLV**	**ID**
EGLE Generic Residential Volatile Soil Inhalation Criteria (VSIC)			**81,000,000**	**2,200,000**	**1,400,000,000**	**NLV (ID)**	**1,500,000**	**ID**
EGLE Generic Residential Particulate Soil Inhalation Criteria			**14,000,000,000**	**2,300,000,000**	**67,000,000,000**	**ID**	**1,500,000**	**ID**
EGLE Generic Residential Direct Contact Criteria			**41,000,000**	**1,600,000**	**230,000,000**	**20,000**	**2,000**	**20,000**
EGLE Generic Non-Residential Direct Contact Criteria			**130,000,000**	**5,200,000**	**730,000,000**	**80,000**	**8,000**	**80,000**

Sample	Date	Description	Benzo(g,h,i)perylene 191242	Benzo(k)fluoranthene 207089	Chrysene 218019	Dibenzo(a,h)anthracene 53703	Fluoranthene 206440	Fluorene 86737
2a	12/22/2022	2'- 3'	1,300	3,700	2,800	<300	**6,100**	500
2a-D	12/22/2022	duplicate	1,200	4,000	2,200	500	4,500	<300
3a	12/22/2022	2'- 3'	1,700	6,900	4,200	600	**9,100**	500
5a	12/22/2022	0'- 1'	300	1,300	700	<300	1,300	<300
EGLE Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels			**NA**	**NA**	**NA**	**NA**	**NA**	**470,000**
EGLE Non-Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels			**NA**	**NA**	**NA**	**NA**	**NA**	**8,300,000**
EGLE Generic Residential Groundwater Protection Criteria			**NLL/NLL**	**NLL/NLL**	**NLL/NLL**	**NLL/NLL**	**730,000/5,500**	**390,000/5,300**
EGLE Generic Residential Indoor Air Inhalation Criteria			**NLV**	**NLV**	**ID**	**NLV**	**1,000,000,000**	**580,000,000**
EGLE Generic Non-Residential Indoor Air Inhalation Criteria			**NLV**	**NLV**	**ID**	**NLV**	**1,000,000,000**	**1,000,000,000**
EGLE Generic Residential Volatile Soil Inhalation Criteria (VSIC)			**NLV**	**NLV**	**ID**	**NLV**	**740,000,000**	**130,000,000**
EGLE Generic Residential Particulate Soil Inhalation Criteria			**800,000,000**	**NLV (ID)**	**ID**	**NLV (ID)**	**740,000,000**	**130,000,000**
EGLE Generic Residential Direct Contact Criteria			**2,500,000**	**200,000**	**2,000,000**	**2,000**	**46,000,000**	**27,000,000**
EGLE Generic Non-Residential Direct Contact Criteria			**7,000,000**	**800,000**	**8,000,000**	**8,000**	**130,000,000**	**87,000,000**

Sample	Date	Description	Indeno(1,2,3-cd)pyrene 193395	2-Methylnaphthalene 91576	Naphthalene 91203	Phenanthrene 85018	Pyrene 129000
2a	12/22/2022	2'- 3'	1,300	<300	<300	**4,200**	4,900
2a-D	12/22/2022	duplicate	1,100	<300	<300	**2,600**	3,800
3a	12/22/2022	2'- 3'	1,700	<300	<300	**5,800**	7,400
5a	12/22/2022	0'- 1'	300	<300	<300	700	1,100
EGLE Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels			**NA**	**1,700**	**67**	**1,700**	**25,000,000**
EGLE Non-Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels			**NA**	**30,000**	**1,900**	**29,000**	**440,000,000**
EGLE Generic Residential Groundwater Protection Criteria			**NLL/NLL**	**57,000/4,200**	**35,000/730**	**56,000/2,100**	**480,000/ID**
EGLE Generic Residential Indoor Air Inhalation Criteria			**NLV**	**2,700,000**	**250,000**	**2,800,000**	**1,000,000,000**
EGLE Generic Non-Residential Indoor Air Inhalation Criteria			**NLV**	**4,900,000**	**470,000**	**5,100,000**	**1,000,000,000**
EGLE Generic Residential Volatile Soil Inhalation Criteria (VSIC)			**NLV (ID)**	**1,500,000**	**300,000**	**160,000**	**650,000,000**
EGLE Generic Residential Particulate Soil Inhalation Criteria			**ID**	**670,000,000**	**200,000,000**	**6,700,000**	**6,700,000,000**
EGLE Generic Residential Direct Contact Criteria			**20,000**	**8,100,000**	**16,000,000**	**1,600,000**	**29,000,000**
EGLE Generic Non-Residential Direct Contact Criteria			**80,000**	**26,000,000**	**52,000,000**	**5,200,000**	**84,000,000**

NOTES:

1. All values expressed in µg/kg
2. Michigan Department of Environment, Great Lakes, and Energy (EGLE) Generic Criteria from Table 2. Soil: Residential, and Table 3. Soil: Nonresidential. Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels," dated December 30, 2013. EGLE VIAP Screening Levels dated September 4, 2020.
3. Most rigorous of Ambient Air Criteria presented.
4. Groundwater Protection Criteria presented as Drinking Water/Ground Water Surface Water Interface (GSI)
5. Chemical Abstract Service (CAS) Numbers are presented below chemicals as provided by EGLE.
6. "ID" = EGLE indicates inadequate data to develop criterion.
7. "NLL" = EGLE indicates not likely to leach.
8. "NLV" = EGLE indicates not likely to volatilize.
9. Boldfaced values exceed EGLE Generic Residential Groundwater Protection Criteria.
10. Values shown thus [ ] exceed EGLE Generic Residential Indoor Air Inhalation Criteri
11. Values shown thus [ ] exceed EGLE Generic Residential Direct Contact Criteria.
12. Values shown thus [ ] exceed EGLE Generic Residential Ambient Air Inhalation Criteria.
13. "*" = Value exceeds multiple EGLE Generic Residential Criteria.

Table 3

Summary of Detected VOCs Chemistry Results (Soil)

McDowell Job No. 22-16348

JL 1/2/2023

TABLE 3 - SUMMARY OF DETECTED VOLATILE ORGANICS CHEMISTRY RESULTS (Soil)

Sample	Date	Description	p-Isopropyltoluene	2-Methylnaphthalene 91576	Naphthalene 91203	Toluene 108883	Trichloroethene 79016	Xylenes 1330207
3a	12/22/2022	2'- 3'	100	200	300	200	<60	170
3b	12/22/2022	5'- 6'	100	<100	<300	<60	<60	<160
EGLE Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels			**NC**	**1,700**	**67**	**3,700**	**0.33**	**280**
EGLE Non-Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels			**NC**	**30,000**	**1,900**	**64,000**	**4.0**	**5,000**
EGLE Generic Residential Groundwater Protection Criteria			**NC**	**57,000/4,200**	**35,000/730**	**16,000/5,400**	**100/4,000**	**5,600/820**
EGLE Generic Non-Residential Groundwater Protection Criteria			**NC**	**170,000/4,200**	**100,000/730**	**16,000/5,400**	**100/4,000**	**5,600/820**
EGLE Generic Residential Indoor Air Inhalation Criteria			**NC**	**2,700,000**	**250,000**	**330,000**	**1,000**	**6,300,000**
EGLE Generic Non-Residential Indoor Air Inhalation Criteria			**NC**	**4,900,000**	**470,000**	**610,000**	**1,900**	**12,000,000**
EGLE Generic Residential Volatile Soil Inhalation Criteria (VSIC)			**NC**	**1,500,000**	**300,000**	**2,800,000**	**11,000**	**46,000,000**
EGLE Generic Non-Residential Volatile Soil Inhalation Criteria (VSIC)			**NC**	**1,800,000**	**350,000**	**3,300,000**	**14,000**	**54,000,000**
EGLE Generic Residential Particulate Soil Inhalation Criteria			**NC**	**670,000,000**	**200,000,000**	**27,000,000,000**	**130,000,000**	**290,000,000,000**
EGLE Generic Non-Residential Particulate Soil Inhalation Criteria			**NC**	**290,000,000**	**88,000,000**	**12,000,000,000**	**59,000,000**	**1.3E+11**
EGLE Generic Residential Direct Contact Criteria			**NC**	**8,100,000**	**16,000,000**	**50,000,000**	**110,000**	**410,000,000**
EGLE Generic Non-Residential Direct Contact Criteria			**NC**	**26,000,000**	**52,000,000**	**160,000,000**	**660,000**	**1,000,000,000**

NOTES:

1. All values expressed in µg/kg
2. Michigan Department of Environment, Great Lakes, and Energy (EGLE) Generic Criteria from Table 2. Soil: Residential, and Table 3. Soil: Nonresidential. Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels," dated December 30, 2013. EGLE VIAP Screening Levels dated September 4, 2020.
3. Most rigorous of Ambient Air Criteria presented.
4. Groundwater Protection Criteria presented as Drinking Water/Ground Water Surface Water Interface (GSI)
5. Chemical Abstract Service (CAS) Numbers are presented below chemicals as provided by EGLE.
6. Boldfaced values exceed EGLE Generic Residential Drinking Water Groundwater Protection Criteria.
7. Values shown thus [ ] exceed EGLE Generic Residential GSI Groundwater Protection Criteria
8. Values shown thus [ ] exceed EGLE Generic Residential Direct Contact Criteria.
9. Values shown thus [ ] exceed EGLE Residential VIAP Screening Levels.
10. NC- no published criteria or screening levels.

Table 4

Summary of Pesticides and PCBs Chemistry Results (Soil)

McDowell Job No. 22-16348

JL 1/2/2023

TABLE 4 - SUMMARY OF PESTICIDES AND PCBs CHEMISTRY RESULTS (Soil)

Sample	Date	Description	4,4-DDD 72548	4,4-DDE 72559	4,4-DDT 50293	Chlordane 57749	Endosulfans 115297	Polychlorinated Biphenyls 1336363
3a	12/22/2022	2'- 3'	NT	NT	NT	NT	NT	<300
4a	12/22/2022	1'- 2'	<20	120	80	<100	<20	NT
5a	12/22/2022	0'- 1'	20	20	30	<100	<20	400
EGLE Residential Volatilization to Indoor Air Pathway (VIAP) Screening Levels			**NA**	**39,000**	**NA**	**13,000**	**TX**	**DATA**
EGLE Generic Residential Groundwater Protection Criteria			**NLL/NLL**	**NLL/NLL**	**NLL/NLL**	**NLL/NLL**	**NLL/NLL**	**NLL/NLL**
EGLE Generic Residential Indoor Air Inhalation Criteria			**NLV**	**NLV**	**NLV**	**11,000,000**	**ID**	**3,000,000**
EGLE Generic Residential Ambient Air Inhalation Criteria			**44,000,000**	**32,000,000**	**32,000,000**	**31,000,000**	**ID**	**240,000**
EGLE Generic Residential Direct Contact Criteria			**95,000**	**45,000**	**57,000**	**31,000**	**1,400,000**	**4,000**

NOTES:

1. All values expressed in µg/kg
2. Michigan Department of Environment, Great Lakes, and Energy (EGLE) Generic Criteria from Table 2. Soil: Residential, and Table 3. Soil: Nonresidential. Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Risk-Based Screening Levels," dated December 30, 2013.
3. Most rigorous of Ambient Air Criteria presented.
4. Groundwater Protection Criteria presented as Drinking Water/Ground Water Surface Water Interface (GSI)
5. Chemical Abstract Service (CAS) Numbers are presented below chemicals as provided by EGLE.
6. "NLL" = EGLE indicates not likely to leach.
7. "NLV" = EGLE indicates not likely to volatilize.
8. Boldfaced values exceed EGLE Generic Residential Drinking Water Groundwater Protection Criteria.
9. Values shown thus [ ] exceed EGLE Generic Residential Ambient Air Inhalation Criteria.
10. TX- EGLE indicates an inhalation toxicity value has not been identifed.
11. DATA- EGLE indicates insufficient chemical parameters have been identified to allow development of a VIAP Screening Level. If detections are identified, health-based soil vapor should be used to evaluate risk.

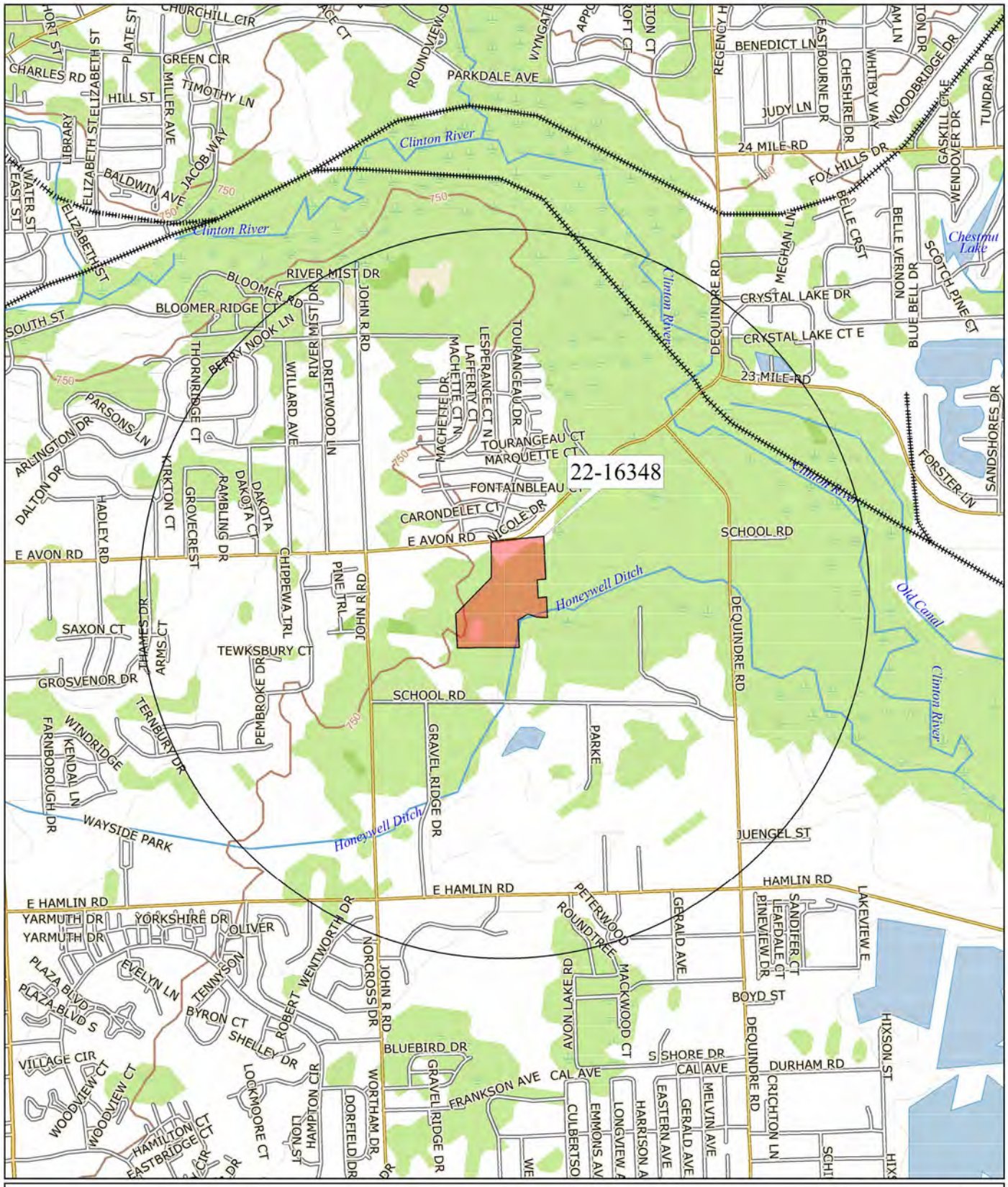
Attachment I

Site Location Map

McDowell & Associates

JOB NUMBER: 22-16348

SITE LOCATION MAP



SCALE 1 : 24,000

0 600 1200 1800 2400 3000 ft

0 200 400 600 800 1000 m

1" = 2,000' DATA ZOOM 13-0

N

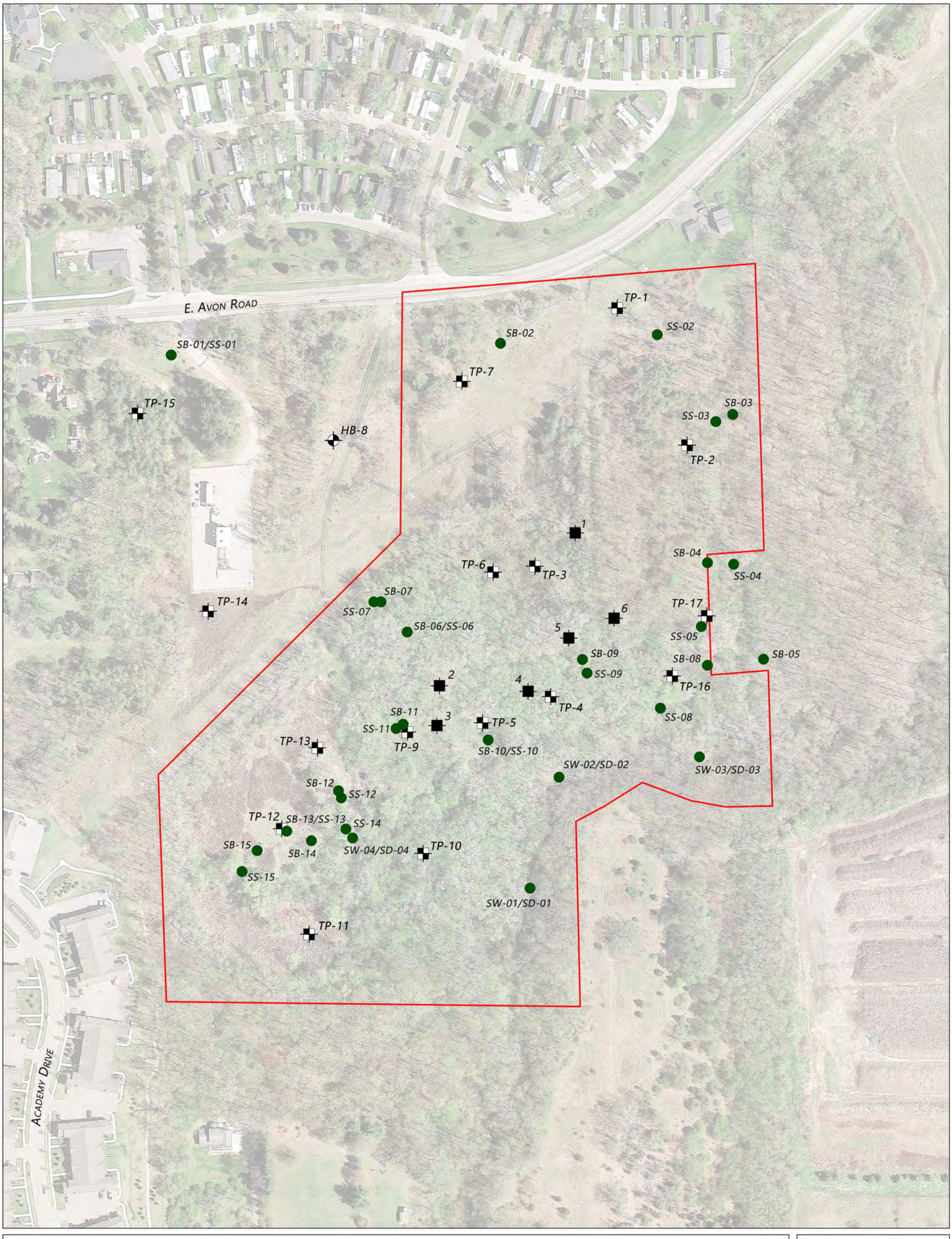
Attachment II

Test Pit, Soil Boring, and Sample Location Map

McDowell & Associates

JOB NUMBER: 22-16348

SOIL BORING, TEST PIT AND SAMPLE LOCATION MAP



LEGEND

- TEST PIT (M&A 2022)
- SOIL BORING (M&A 04-142)
- TEST PIT (M&A 04-142)
- SOIL BORING/SOIL, WATER OR SEDIMENT SAMPLE (2011 BY OTHERS)
- APPROXIMATE PROPERTY BOUNDARY

NOTES:

- 2022 AERIAL PHOTOGRAPH
- ALL LOCATIONS APPROXIMATE

N

1" = 200'

0 100' 200'

Attachment III

Log of Test Pit Sheets

McDOWELL & ASSOCIATES
Geotechnical, Environmental, & Hydrogeologic Services
21355 Hatcher Avenue • Ferndale, MI 48220
Phone: (248) 399-2066 • Fax: (248) 399-2157

Test Pit Log

PROJECT Environmental Site Assessment

JOB NO. 22-16348

LOCATION 1406 Avon Road

TEST PIT NO. 1

DATE 12/22/22

Rochester Hills, Oakland County, Michigan

DEPTH	SOIL	SOIL DESCRIPTION	PID
0'6"			
1'0"		Moist dark brown sandy TOPSOIL	ND
1'6"		1'6"	
2'0"			
2'6"			
3'0"		Moist brown silty SAND with pebbles	ND
3'6"			
4'0"			
4'6"		4'0" Moist light brown medium to coarse SAND with pebbles	
5'0"			ND
5'6"		5'0"	
6'0"			
6'6"			
7'0"			
7'6"			
8'0"			
8'6"			
9'0"			
9'6"			
10'0"			
10'6"		Notes:	
11'0"		PID Readings from MiniRAE 3000 photoionization detector as parts per million (ppm, calibrated to isobutylene).	
11'6"			
12'0"		ND = None Detected	
12'6"			
13'0"			

No groundwater encountered.

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Test Pit Log

PROJECT Environmental Site Assessment

JOB NO. 22-16348

LOCATION 1406 Avon Road

TEST PIT NO. 2

DATE 12/22/22

Rochester Hills, Oakland County, Michigan

DEPTH	SOIL	SOIL DESCRIPTION	PID
0'6"		Moist dark brown sandy TOPSOIL, fill	
1'0"			ND
1'6"			
2'0"			
2'6"			ND
3'0"		Moist brown to dark brown SAND with glass, metal, ceramic, brick and concrete, fill	
3'6"			
4'0"			ND
4'6"			
5'0"			
5'6"		Moist brown silty SAND	
6'0"			ND
6'6"		Moist brown clayey SAND	
7'0"			ND
7'6"			
8'0"			
8'6"			
9'0"			
9'6"			
10'0"			
10'6"		Notes:	
11'0"		PID Readings from MiniRAE 3000 photoionization detector as parts per million (ppm, calibrated to isobutylene).	
11'6"			
12'0"		ND = None Detected	
12'6"			
13'0"			

0'6"

5'0"

6'0"

7'0"

No groundwater encountered.

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Test Pit Log

PROJECT Environmental Site Assessment

JOB NO. 22-16348

LOCATION 1406 Avon Road

TEST PIT NO. 3

DATE 12/22/22

Rochester Hills, Oakland County, Michigan

DEPTH	SOIL	SOIL DESCRIPTION	PID
0'6"			
1'0"			
1'6"			
2'0"			ND
2'6"			
3'0"		Moist brown to dark brown SAND with metal, slag, tire, brick, glass, organics, concrete and bottles, fill	
3'6"			
4'0"			ND
4'6"			
5'0"			
5'6"			
6'0"			ND
6'6"		6'0" Moist brown silty SAND	
7'0"		7'0"	ND
7'6"			
8'0"			
8'6"			
9'0"			
9'6"			
10'0"			
10'6"		Notes:	
11'0"		PID Readings from MiniRAE 3000 photoionization detector as parts per million (ppm, calibrated to isobutylene).	
11'6"			
12'0"		ND = None Detected	
12'6"			
13'0"			

No groundwater encountered.

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Test Pit Log

PROJECT Environmental Site Assessment

LOCATION 1406 Avon Road

Rochester Hills, Oakland County, Michigan

JOB NO. 22-16348

TEST PIT NO. 4

DATE 12/22/22

DEPTH	SOIL	SOIL DESCRIPTION	PID
0'6"		Moist dark brown sandy TOPSOIL, fill	
1'0"			ND
1'6"		Moist brown to dark brown sandy TOPSOIL with wood and trace of ceramic pieces, fill	
2'0"			
2'6"			
3'0"			ND
3'6"			
4'0"		Moist dark brown SAND with metal, glass, ceramic and wood, fill	
4'6"			
5'0"			ND
5'6"			
6'0"		Moist brown silty SAND	ND
6'6"			
7'0"			
7'6"			
8'0"			
8'6"			
9'0"			
9'6"			
10'0"			
10'6"		Notes:	
11'0"		PID Readings from MiniRAE 3000 photoionization detector as parts per million (ppm, calibrated to isobutylene).	
11'6"			
12'0"		ND = None Detected	
12'6"			
13'0"			

0'6"
2'0"
5'6"
6'6"

No groundwater encountered.

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Test Pit Log

PROJECT Environmental Site Assessment

JOB NO. 22-16348

LOCATION 1406 Avon Road

TEST PIT NO. 5

DATE 12/22/22

Rochester Hills, Oakland County, Michigan

DEPTH	SOIL	SOIL DESCRIPTION	PID
0'6"			
1'0"		Moist dark brown clayey sandy TOPSOIL with trace of brick, fill	ND
		1'0"	
1'6"		Moist brown to dark brown clayey SAND with topsoil and wood, fill	
2'0"			
		2'0"	
2'6"			ND
3'0"		Moist brown silty SAND, fill	
3'6"			ND
		3'6"	
4'0"			
4'6"		Moist brown to dark brown clayey SAND with trace of concrete and brick, fill	
5'0"			ND
5'6"			
		5'6"	
6'0"			
6'6"		Moist brown silty fine SAND	ND
7'0"			
		7'0"	
7'6"			
8'0"			
8'6"			
9'0"			
9'6"			
10'0"			
10'6"		Notes:	
11'0"		PID Readings from MiniRAE 3000 photoionization detector as parts per million (ppm, calibrated to isobutylene).	
11'6"			
12'0"		ND = None Detected	
12'6"			
13'0"			

No groundwater encountered.

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Test Pit Log

PROJECT Environmental Site Assessment

JOB NO. 22-16348

LOCATION 1406 Avon Road

TEST PIT NO. 6

DATE 12/22/22

Rochester Hills, Oakland County, Michigan

DEPTH	SOIL	SOIL DESCRIPTION	PID
0'6"		Moist dark brown sandy TOPSOIL with trace of brick, fill	
1'0"			ND
1'6"		Moist brown clayey SAND with gravel and brick, fill	
2'0"			
2'6"			
3'0"		Moist dark brown sandy TOPSOIL	ND
3'6"			
4'0"		Moist brown silty fine SAND	
4'6"			
5'0"			ND
5'6"			
6'0"			
6'6"			
7'0"			
7'6"			
8'0"			
8'6"			
9'0"			
9'6"			
10'0"			
10'6"		Notes:	
11'0"		PID Readings from MiniRAE 3000 photoionization detector as parts per million (ppm, calibrated to isobutylene).	
11'6"			
12'0"		ND = None Detected	
12'6"			
13'0"			

0'6"
2'6"
3'0"
5'0"

No groundwater encountered.

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LOG OF TEST PIT NO. TP-1

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Moist dark brown silty sandy TOPSOIL, VEGETATION & ROOTS, fill						
	2		2'0" Moist brown silty CLAY						
	3		2'8" Wet brown silty fine SAND with pebbles and occasional stones						
	4		4'0"						
	5								
	6		Wet brown fine to medium SAND with gravel						
	7		7'3"						
	8		Wet gray fine to medium SAND with gravel						
	9		8'4"						
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	2	FT.	6	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	4	FT.	10	INS.
G.W. AFTER	7½ HRS.	3	FT.	0	INS.

G.W. VOLUMES heavy cave in @ 3'±

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LOG OF TEST PIT NO. TP-2

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Moist dark brown silty sandy TOPSOIL 1'0"						
	2								
	3		Moist to wet brown silty fine to medium SAND with gravel						
	4								
	5								
	6		6'0"						
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19		Note: Adjacent excavation (tree planting hole) had water level at 1'6" below existing ground surface.						
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D.- - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test • Driving 2" OD Sampler 1" With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	3	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	3	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.

G.W. VOLUMES heavy cave in @ 2'±

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LOG OF TEST PIT NO. TP-3

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Moist dark brown and black silty sandy TOPSOIL & VEGETATION, fill						
			1'4"						
	2								
	3		Moist to wet brown silty fine to medium SAND with gravel						
	4								
	5								
	6		6'0"						
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	2	FT.	4	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION		FT.		INS.
G.W. AFTER	5 HRS.	2	FT.	2	INS.

G.W. VOLUMES heavy cave in @ 2'±

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LOG OF TEST PIT NO. TP-4

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Sp. %
	1		Moist brown and dark brown fine sandy TOPSOIL & VEGETATION, fill						
			1'0"						
	2		STUMPS, TREE LIMBS and moist brown oxidized silty SAND, fill						
	3		2'6"						
	4		Moist oxidized fine SAND mixed with broken glass, fill						
	5		5'0"						
	6		Wet brown silty fine SAND						
	7								
	8		8'0"						
	9		Wet gray sandy SILT						
			9'6"						
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	5	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	5	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.

G.W. VOLUMES heavy cave in @ 5'±

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LOG OF TEST PIT NO. TP-5

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Silt %
	1		Moist brown oxidized sandy silty clayey TOPSOIL						
			1'0"						
	2								
	3								
	4		STUMPS, TREE LIMBS (6" to 12" diameter 5' to 6' in length) oxidized clayey silty SAND & BROKEN CONCRETE, fill						
	5								
	6								
	7								
	8								
			8'0" Wet gray sandy SILT mixed with decomposed wood, fill						
	9		9'0"						
	10								
	11		Wet decomposed WOOD, fill						
	12								
			12'0"						
	13		Wet gray clayey SILT (P.P. = 1,000 psf)						
			13'0"						
	14								
	15								
	16								
	17								
	18								
	19		Note: Stumps as large as 6' to 7' long, 18" to 24" diameter.						
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	8	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	8	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES heavy cave in @ 2'±				

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LOG OF TEST PIT NO. TP-6

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Moist dark brown and black silty fine sandy TOPSOIL & VEGETATION, fill						
			1'6"						
	2		Moist to wet brown fine SAND with occasional pebbles and bottles, fill						
	3								
			3'6"						
	4		Wet brown fine to medium SAND with gravel						
	5								
			5'5"						
	6								
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	1	FT.	10	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	1	FT.	10	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES heavy cave in @ 1'±				

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LOG OF TEST PIT NO. TP-7

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
			Moist dark brown silty sandy TOPSOIL &						
	1		0'10" VEGETATION, fill						
	2								
	3		Wet brown fine SAND						
	4								
	5		5'3"						
	6		Wet gray fine to medium SAND with gravel						
	7		6'6"						
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	0	FT.	10	ING.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	0	FT.	10	INS.
G.W. AFTER HRS.		FT.		INS.

G.W. VOLUMES heavy cave in @ 0'10"

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Geotechnical, Environmental, & Hydrogeologic Services
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Phone: (248) 399-2066 • Fax: (248) 399-2157

LOG OF TEST PIT NO. TP-9

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
			0'6" Moist brown oxidized silty sandy TOPSOIL & VEGETATION, fill						
	1								
	2								
	3		TREE STUMPS, METAL DEBRIS, BROKEN CONCRETE mixed with discolored sand						
	4								
	5		5'0"						
	6		Moist brown oxidized silty fine SAND, fill						
	7								
	8		8'0"						
	9		Wet brown and gray fine to medium SAND with gravel						
	10								
	11		10'6"						
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	8	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	8	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES heavy cave in @ 8'±				

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LOG OF TEST PIT NO. TP-10

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Moist dark brown silty sandy TOPSOIL & VEGETATION, fill						
			1'2"						
	2		Moist brown fine SAND with some silt content						
	3		2'9"						
	4		Moist to wet brown fine to medium SAND with gravel and slight silt content						
	5		5'0"						
	6		Wet gray clayey SILT						
			5'10"						
	7		Moist blue silty CLAY						
	8		8'6"						
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	5	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	5	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES	Medium			

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LOG OF TEST PIT NO. TP-11

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Moist brown and black silty sandy TOPSOIL & VEGETATION, fill						
	2		2'0"						
	3		Moist brown fine SAND with some silty content						
	4								
	5								
	6		5'9" Moist to wet brown fine to medium SAND with gravel						
	7		7'0"						
	8		Wet gray sandy SILT						
	9		8'6"						
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	7	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	7	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.

G.W. VOLUMES heavy cave in @ 3'±

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LOG OF TEST PIT NO. TP-12

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Moist brown sandy CLAY with vegetation, fill						
			0'8"						
	2								
	3		Moist oxidized clayey SAND mixed with asphalt, gravel and trace of vegetation, fill						
	4								
	5								
	6		6'0"						
	7		TREE STUMPS AND LIMBS, fill						
	8								
	9		9'0"						
	10		Wet gray silty fine SAND						
	11		10'6"						
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19		Note: Stumps as large as 3' diameter.						
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.I. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	9	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	9	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.
G.W. VOLUMES heavy	cave in @ 6'±			

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LOG OF TEST PIT NO. TP-13

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
			0'7" Moist brown clayey TOPSOIL & VEGETATION, fill						
	1								
	2		Moist brown oxidized silty sandy gravelly CLAY with some decomposed wood, fill						
	3								
	4								
			4'0" Wet brown fine to medium SAND & GRAVEL with some stumps and limbs, fill						
	5								
			5'6"						
	6		6'6" Wet gray sandy clayey SILT						
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT	4	FT.	0	INS.
G.W. ENCOUNTERED AT		FT.		INS.
G.W. AFTER COMPLETION	4	FT.	0	INS.
G.W. AFTER HRS.		FT.		INS.

G.W. VOLUMES heavy cave in @ 2'+

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LOG OF TEST PIT NO. TP-16

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	1		Moist dark brown and black silty fine sandy TOPSOIL & VEGETATION with trace of plastic sheeting, fill						
	2								
			2'0"						
	3		Moist brown clayey silty fine SAND with pebbles and occasional stones, fill						
			3'0"						
	4								
	5								
	6		Moist variegated very silty fine SAND with seams and layers of moist brown sandy silt						
	7								
	8								
	9								
	10								
			10'6"						
	11								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19		Note: Gas vents in place.						
	20								
	21								
	22								
	23								
	24								
	25								

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1" With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT		FT.	INS.
G.W. ENCOUNTERED AT		FT.	INS.
G.W. AFTER COMPLETION	none	FT.	INS.
G.W. AFTER	HRS.	FT.	INS.
G.W. VOLUMES			

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LOG OF TEST PIT NO. TP-17

PROJECT Highland Park Site

JOB NO. 04-142

LOCATION Avon and John R Roads

SURFACE ELEV. _____ DATE 4-02-04

Rochester Hills, Michigan

Sample & Type	Depth	Legend	SOIL DESCRIPTION	Penetration Blows for 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Sr. %
			Moist black silty fine sandy TOPSOIL & VEGETATION, fill						
	2'0"		Concrete Slab at 2'0"						

Notes:
TP-17 excavated adjacent to old asphalt pavement, unable to find limits of slab. Small diameter trees in and around TP-17.

20' long trench approximately 1.5' to 2' deep, excavated with backhoe.

TYPE OF SAMPLE
D. - DISTURBED
U.L. - UNDIST. LINER
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS:

Standard Penetration Test - Driving 2" OD Sampler 1' With 140# Hammer Falling 30": Count Made at 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT		FT.	INS.
G.W. ENCOUNTERED AT		FT.	INS.
G.W. AFTER COMPLETION	none	FT.	INS.
G.W. AFTER	HRS.	FT.	INS.
G.W. VOLUMES			

Attachment IV

Chemical Test Results with Chain-of-Custody Documentation

Analytical Laboratory Report

Supplemental Report

Report ID: S43774.01(02)
Generated on 12/30/2022
Replaces report S43774.01(01) generated on 12/30/2022

Report to

Attention: Jennifer Lagerbohm
McDowell & Associates
21355 Hatcher Avenue
Ferndale, MI 48220

Phone: O:248-399-2066 C:248-514-6950 FAX:
Email: jennifer.lagerbohm@mcdowasc.com

Addtional Contacts: John Kemp, Melanie McDowell

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S43774.01-S43774.06
Project: 22-16348
Collected Date(s): 12/22/2022
Submitted Date/Time: 12/22/2022 11:55
Sampled by: Jen L
P.O. #:

Table of Contents

Maya Murshak
Technical Director

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.
Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

All analyses completed

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
SM2540B	Standard Method 2540 B 2015
SW3050B	SW 846 Method 3050B Revision 2 December 1996
SW3546	SW 846 Method 3546 Revision 0 February 2007
SW5035A	SW 846 Method 5035A Revision 1 July 2002
SW5035A/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5035A Revision 1 July 2002
SW6020A	SW 846 Method 6020A Revision 1 February 2007
SW7471B	SW 846 Method 7471B Revision 2 February 2007
SW8081B	SW 846 Method 8081B Revision 2 February 2007
SW8082A	SW 846 Method 8082A Revision 1 February 2007
SW8270D	SW 846 Method 8270D Revision 4 February 2007

Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S43774.01	2a	Soil	12/22/22 08:00
S43774.02	2a-D	Soil	12/22/22 08:00
S43774.03	3a	Soil	12/22/22 08:00
S43774.04	3b	Soil	12/22/22 08:00
S43774.05	4a	Soil	12/22/22 08:00
S43774.06	5a	Soil	12/22/22 10:00

Lab Sample ID: S43774.01
Sample Tag: 2a
Collected Date/Time: 12/22/2022 08:00
Matrix: Soil
COC Reference: 151452

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	5.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	12/27/22 10:45	JRH	
PNA Extraction*	Completed	SW3546	12/30/22 12:20	JGH	
Mercury Digestion	Completed	SW7471B	12/29/22 13:56	CTV	

Inorganics

Method: SM2540B, Run Date: 12/22/22 16:12, Analyst: MAM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	89	1		%	1		

Metals

Method: SW6020A, Run Date: 12/27/22 12:52, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	13.3	0.20		mg/kg	256	7440-38-2	
Barium	844	1.0		mg/kg	256	7440-39-3	
Cadmium	4.71	0.20		mg/kg	256	7440-43-9	
Chromium	22.2	0.50		mg/kg	256	7440-47-3	
Copper	131	0.50		mg/kg	256	7440-50-8	
Lead	322	0.30		mg/kg	256	7439-92-1	
Selenium	0.63	0.40		mg/kg	256	7782-49-2	
Silver	1.13	0.20		mg/kg	256	7440-22-4	
Zinc	489	0.50		mg/kg	256	7440-66-6	

Method: SW7471B, Run Date: 12/29/22 15:01, Analyst: CTV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	0.357	0.050		mg/kg	68	7439-97-6	

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/30/22 15:49, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	6	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	6	208-96-8	
Anthracene	1,100	300		ug/kg	6	120-12-7	
Benzo(a)anthracene	2,800	300		ug/kg	6	56-55-3	
Benzo(a)pyrene	2,500	300		ug/kg	6	50-32-8	
Benzo(b)fluoranthene	3,300	300		ug/kg	6	205-99-2	p
Benzo(k)fluoranthene	3,700	300		ug/kg	6	207-08-9	p
Benzo(ghi)perylene	1,300	300		ug/kg	6	191-24-2	
Chrysene	2,800	300		ug/kg	6	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	6	53-70-3	
Fluoranthene	6,100	300		ug/kg	6	206-44-0	
Fluorene	500	300		ug/kg	6	86-73-7	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.

Lab Sample ID: S43774.01 (continued)

Sample Tag: 2a

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/30/22 15:49, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Indeno(1,2,3-cd)pyrene	1,300	300		ug/kg	6	193-39-5	
Naphthalene	Not detected	300		ug/kg	6	91-20-3	
Phenanthrene	4,200	300		ug/kg	6	85-01-8	
Pyrene	4,900	300		ug/kg	6	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	6	91-57-6	

Lab Sample ID: S43774.02
Sample Tag: 2a-D
Collected Date/Time: 12/22/2022 08:00
Matrix: Soil
COC Reference: 151452

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	5.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	12/27/22 10:45	JRH	
PNA Extraction*	Completed	SW3546	12/30/22 12:20	JGH	
Mercury Digestion	Completed	SW7471B	12/29/22 13:56	CTV	

Inorganics

Method: SM2540B, Run Date: 12/22/22 16:12, Analyst: MAM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	89	1		%	1		

Metals

Method: SW6020A, Run Date: 12/27/22 12:54, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	13.9	0.20		mg/kg	266	7440-38-2	
Barium	727	1.0		mg/kg	266	7440-39-3	
Cadmium	6.86	0.20		mg/kg	266	7440-43-9	
Chromium	19.8	0.50		mg/kg	266	7440-47-3	
Copper	494	0.50		mg/kg	266	7440-50-8	
Lead	999	0.30		mg/kg	266	7439-92-1	
Selenium	1.01	0.40		mg/kg	266	7782-49-2	
Silver	2.31	0.20		mg/kg	266	7440-22-4	
Zinc	723	0.50		mg/kg	266	7440-66-6	

Method: SW7471B, Run Date: 12/29/22 15:04, Analyst: CTV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	0.323	0.050		mg/kg	66	7439-97-6	

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/30/22 16:13, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	6	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	6	208-96-8	
Anthracene	700	300		ug/kg	6	120-12-7	
Benzo(a)anthracene	2,000	300		ug/kg	6	56-55-3	
Benzo(a)pyrene	2,000	300		ug/kg	6	50-32-8	
Benzo(b)fluoranthene	3,600	300		ug/kg	6	205-99-2	p
Benzo(k)fluoranthene	4,000	300		ug/kg	6	207-08-9	p
Benzo(ghi)perylene	1,200	300		ug/kg	6	191-24-2	
Chrysene	2,200	300		ug/kg	6	218-01-9	
Dibenzo(ah)anthracene	500	300		ug/kg	6	53-70-3	
Fluoranthene	4,500	300		ug/kg	6	206-44-0	
Fluorene	Not detected	300		ug/kg	6	86-73-7	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.

Lab Sample ID: S43774.02 (continued)

Sample Tag: 2a-D

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/30/22 16:13, Analyst: JGH (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Indeno(1,2,3-cd)pyrene	1,100	300		ug/kg	6	193-39-5	
Naphthalene	Not detected	300		ug/kg	6	91-20-3	
Phenanthrene	2,600	300		ug/kg	6	85-01-8	
Pyrene	3,800	300		ug/kg	6	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	6	91-57-6	

Lab Sample ID: S43774.03
Sample Tag: 3a
Collected Date/Time: 12/22/2022 08:00
Matrix: Soil
COC Reference: 151452

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	5.1	IR
1	40ml Glass	MeOH	Yes	5.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	12/27/22 10:45	JRH	
Extraction, PCB*	Completed	SW3546	12/27/22 13:00	TAW	
PNA Extraction*	Completed	SW3546	12/30/22 12:20	JGH	
Sample wt. (g) / Methanol (ml)*	9.851/10	SW5035A	12/27/22 12:20	BDO	
Mercury Digestion	Completed	SW7471B	12/29/22 13:56	CTV	

Inorganics

Method: SM2540B, Run Date: 12/22/22 16:12, Analyst: MAM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	89	1		%	1		

Metals

Method: SW6020A, Run Date: 12/27/22 12:56, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	24.5	0.20		mg/kg	262	7440-38-2	
Barium	862	1.0		mg/kg	262	7440-39-3	
Cadmium	7.64	0.20		mg/kg	262	7440-43-9	
Chromium	303	0.50		mg/kg	262	7440-47-3	
Copper	1,710	0.50		mg/kg	262	7440-50-8	
Lead	1,370	0.30		mg/kg	262	7439-92-1	
Selenium	1.67	0.40		mg/kg	262	7782-49-2	
Silver	4.95	0.20		mg/kg	262	7440-22-4	
Zinc	1,050	0.50		mg/kg	262	7440-66-6	

Method: SW7471B, Run Date: 12/29/22 15:07, Analyst: CTV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	0.812	0.050		mg/kg	64	7439-97-6	

Organics - PCBs/Pesticides

PCB List, Method: SW8082A, Run Date: 12/28/22 13:54, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PCB-1016	Not detected	330		ug/kg	10	12674-11-2	
PCB-1242	Not detected	330		ug/kg	10	53469-21-9	
PCB-1221	Not detected	330		ug/kg	10	11104-28-2	
PCB-1232	Not detected	330		ug/kg	10	11141-16-5	
PCB-1248	Not detected	330		ug/kg	10	12672-29-6	
PCB-1254	Not detected	330		ug/kg	10	11097-69-1	
PCB-1260	Not detected	330		ug/kg	10	11096-82-5	

Lab Sample ID: S43774.03 (continued)
Sample Tag: 3a

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/30/22 16:36, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	400	300		ug/kg	6	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	6	208-96-8	
Anthracene	1,600	300		ug/kg	6	120-12-7	
Benzo(a)anthracene	3,900	300		ug/kg	6	56-55-3	
Benzo(a)pyrene	3,300	300		ug/kg	6	50-32-8	
Benzo(b)fluoranthene	6,200	300		ug/kg	6	205-99-2	p
Benzo(k)fluoranthene	6,900	300		ug/kg	6	207-08-9	p
Benzo(ghi)perylene	1,700	300		ug/kg	6	191-24-2	
Chrysene	4,200	300		ug/kg	6	218-01-9	
Dibenzo(ah)anthracene	600	300		ug/kg	6	53-70-3	
Fluoranthene	9,100	300		ug/kg	6	206-44-0	
Fluorene	500	300		ug/kg	6	86-73-7	
Indeno(1,2,3-cd)pyrene	1,700	300		ug/kg	6	193-39-5	
Naphthalene	Not detected	300		ug/kg	6	91-20-3	
Phenanthrene	5,800	300		ug/kg	6	85-01-8	
Pyrene	7,400	300		ug/kg	6	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	6	91-57-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/28/22 23:12, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	300		ug/kg	63.2	60-29-7	
Acetone	Not detected	1,000		ug/kg	63.2	67-64-1	
Methyl iodide	Not detected	100		ug/kg	63.2	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	63.2	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	300		ug/kg	63.2	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	63.2	107-13-1	
2-Butanone (MEK)	Not detected	950		ug/kg	63.2	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	63.2	75-71-8	
Chloromethane	Not detected	300		ug/kg	63.2	74-87-3	
Vinyl chloride	Not detected	60		ug/kg	63.2	75-01-4	
Bromomethane	Not detected	300		ug/kg	63.2	74-83-9	
Chloroethane	Not detected	300		ug/kg	63.2	75-00-3	
Trichlorofluoromethane	Not detected	100		ug/kg	63.2	75-69-4	
1,1-Dichloroethene	Not detected	60		ug/kg	63.2	75-35-4	
Methylene chloride	Not detected	100		ug/kg	63.2	75-09-2	
trans-1,2-Dichloroethene	Not detected	60		ug/kg	63.2	156-60-5	
1,1-Dichloroethane	Not detected	60		ug/kg	63.2	75-34-3	
cis-1,2-Dichloroethene	Not detected	60		ug/kg	63.2	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	63.2	109-99-9	
Chloroform	Not detected	60		ug/kg	63.2	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	63.2	74-97-5	
1,1,1-Trichloroethane	Not detected	60		ug/kg	63.2	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	63.2	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	63.2	591-78-6	
Carbon tetrachloride	Not detected	60		ug/kg	63.2	56-23-5	
Benzene	Not detected	60		ug/kg	63.2	71-43-2	
1,2-Dichloroethane	Not detected	60		ug/kg	63.2	107-06-2	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.

Lab Sample ID: S43774.03 (continued)

Sample Tag: 3a

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/28/22 23:12, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Trichloroethene	Not detected	60		ug/kg	63.2	79-01-6	
1,2-Dichloropropane	Not detected	60		ug/kg	63.2	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	63.2	75-27-4	
Dibromomethane	Not detected	300		ug/kg	63.2	74-95-3	
cis-1,3-Dichloropropene	Not detected	60		ug/kg	63.2	10061-01-5	
Toluene	200	60		ug/kg	63.2	108-88-3	
trans-1,3-Dichloropropene	Not detected	60		ug/kg	63.2	10061-02-6	
1,1,2-Trichloroethane	Not detected	60		ug/kg	63.2	79-00-5	
Tetrachloroethene	Not detected	60		ug/kg	63.2	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	60		ug/kg	63.2	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	63.2	124-48-1	
1,2-Dibromoethane	Not detected	30		ug/kg	63.2	106-93-4	M
Chlorobenzene	Not detected	60		ug/kg	63.2	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	63.2	630-20-6	
Ethylbenzene	Not detected	60		ug/kg	63.2	100-41-4	
p,m-Xylene	100	100		ug/kg	63.2		
o-Xylene	70	60		ug/kg	63.2	95-47-6	
Styrene	Not detected	60		ug/kg	63.2	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	63.2	98-82-8	
Bromoform	Not detected	100		ug/kg	63.2	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	60		ug/kg	63.2	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	63.2	96-18-4	
n-Propylbenzene	Not detected	60		ug/kg	63.2	103-65-1	
Bromobenzene	Not detected	100		ug/kg	63.2	108-86-1	
1,3,5-Trimethylbenzene	Not detected	60		ug/kg	63.2	108-67-8	
tert-Butylbenzene	Not detected	60		ug/kg	63.2	98-06-6	
1,2,4-Trimethylbenzene	Not detected	60		ug/kg	63.2	95-63-6	
sec-Butylbenzene	Not detected	60		ug/kg	63.2	135-98-8	
p-Isopropyltoluene	100	100		ug/kg	63.2	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	63.2	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	63.2	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	63.2	95-50-1	
1,2,3-Trimethylbenzene	Not detected	60		ug/kg	63.2	526-73-8	
n-Butylbenzene	Not detected	60		ug/kg	63.2	104-51-8	
Hexachloroethane	Not detected	400		ug/kg	63.2	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	63.2	96-12-8	
1,2,4-Trichlorobenzene	Not detected	420		ug/kg	63.2	120-82-1	
1,2,3-Trichlorobenzene	Not detected	420		ug/kg	63.2	87-61-6	
Naphthalene	300	300		ug/kg	63.2	91-20-3	
2-Methylnaphthalene	200	100		ug/kg	63.2	91-57-6	

M-Result reported to MDL not RDL

Lab Sample ID: S43774.04
Sample Tag: 3b
Collected Date/Time: 12/22/2022 08:00
Matrix: Soil
COC Reference: 151452

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	5.1	IR
1	40ml Glass	MeOH	Yes	5.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	12/27/22 10:45	JRH	
Sample wt. (g) / Methanol (ml)*	12.519/12	SW5035A	12/27/22 12:20	BDO	
Mercury Digestion	Completed	SW7471B	12/29/22 13:56	CTV	

Inorganics

Method: SM2540B, Run Date: 12/22/22 16:12, Analyst: MAM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	92	1		%	1		

Metals

Method: SW6020A, Run Date: 12/27/22 12:58, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	6.88	0.20		mg/kg	243	7440-38-2	
Barium	271	1.0		mg/kg	243	7440-39-3	
Cadmium	0.92	0.20		mg/kg	243	7440-43-9	
Chromium	8.86	0.50		mg/kg	243	7440-47-3	
Copper	69.4	0.50		mg/kg	243	7440-50-8	
Lead	270	0.30		mg/kg	243	7439-92-1	
Selenium	0.60	0.40		mg/kg	243	7782-49-2	
Silver	1.62	0.20		mg/kg	243	7440-22-4	
Zinc	215	0.50		mg/kg	243	7440-66-6	

Method: SW7471B, Run Date: 12/29/22 15:11, Analyst: CTV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	0.228	0.050		mg/kg	61	7439-97-6	

Organics - Volatiles

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/28/22 23:37, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	200		ug/kg	56.4	60-29-7	
Acetone	Not detected	1,000		ug/kg	56.4	67-64-1	
Methyl iodide	Not detected	100		ug/kg	56.4	74-88-4	
Carbon disulfide	Not detected	300		ug/kg	56.4	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	200		ug/kg	56.4	1634-04-4	
Acrylonitrile	Not detected	100		ug/kg	56.4	107-13-1	
2-Butanone (MEK)	Not detected	850		ug/kg	56.4	78-93-3	
Dichlorodifluoromethane	Not detected	300		ug/kg	56.4	75-71-8	
Chloromethane	Not detected	300		ug/kg	56.4	74-87-3	
Vinyl chloride	Not detected	60		ug/kg	56.4	75-01-4	
Bromomethane	Not detected	200		ug/kg	56.4	74-83-9	
Chloroethane	Not detected	300		ug/kg	56.4	75-00-3	

Lab Sample ID: S43774.04 (continued)
Sample Tag: 3b

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/28/22 23:37, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Trichlorofluoromethane	Not detected	100		ug/kg	56.4	75-69-4	
1,1-Dichloroethene	Not detected	60		ug/kg	56.4	75-35-4	
Methylene chloride	Not detected	100		ug/kg	56.4	75-09-2	
trans-1,2-Dichloroethene	Not detected	60		ug/kg	56.4	156-60-5	
1,1-Dichloroethane	Not detected	60		ug/kg	56.4	75-34-3	
cis-1,2-Dichloroethene	Not detected	60		ug/kg	56.4	156-59-2	
Tetrahydrofuran*	Not detected	1,000		ug/kg	56.4	109-99-9	
Chloroform	Not detected	60		ug/kg	56.4	67-66-3	
Bromochloromethane	Not detected	100		ug/kg	56.4	74-97-5	
1,1,1-Trichloroethane	Not detected	60		ug/kg	56.4	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	3,000		ug/kg	56.4	108-10-1	
2-Hexanone	Not detected	3,000		ug/kg	56.4	591-78-6	
Carbon tetrachloride	Not detected	60		ug/kg	56.4	56-23-5	
Benzene	Not detected	60		ug/kg	56.4	71-43-2	
1,2-Dichloroethane	Not detected	60		ug/kg	56.4	107-06-2	
Trichloroethene	Not detected	60		ug/kg	56.4	79-01-6	
1,2-Dichloropropane	Not detected	60		ug/kg	56.4	78-87-5	
Bromodichloromethane	Not detected	100		ug/kg	56.4	75-27-4	
Dibromomethane	Not detected	300		ug/kg	56.4	74-95-3	
cis-1,3-Dichloropropene	Not detected	60		ug/kg	56.4	10061-01-5	
Toluene	Not detected	60		ug/kg	56.4	108-88-3	
trans-1,3-Dichloropropene	Not detected	60		ug/kg	56.4	10061-02-6	
1,1,2-Trichloroethane	Not detected	60		ug/kg	56.4	79-00-5	
Tetrachloroethene	Not detected	60		ug/kg	56.4	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	60		ug/kg	56.4	110-57-6	
Dibromochloromethane	Not detected	100		ug/kg	56.4	124-48-1	
1,2-Dibromoethane	Not detected	20		ug/kg	56.4	106-93-4	M
Chlorobenzene	Not detected	60		ug/kg	56.4	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	100		ug/kg	56.4	630-20-6	
Ethylbenzene	Not detected	60		ug/kg	56.4	100-41-4	
p,m-Xylene	Not detected	100		ug/kg	56.4		
o-Xylene	Not detected	60		ug/kg	56.4	95-47-6	
Styrene	Not detected	60		ug/kg	56.4	100-42-5	
Isopropylbenzene	Not detected	300		ug/kg	56.4	98-82-8	
Bromoform	Not detected	100		ug/kg	56.4	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	60		ug/kg	56.4	79-34-5	
1,2,3-Trichloropropane	Not detected	100		ug/kg	56.4	96-18-4	
n-Propylbenzene	Not detected	60		ug/kg	56.4	103-65-1	
Bromobenzene	Not detected	100		ug/kg	56.4	108-86-1	
1,3,5-Trimethylbenzene	Not detected	60		ug/kg	56.4	108-67-8	
tert-Butylbenzene	Not detected	60		ug/kg	56.4	98-06-6	
1,2,4-Trimethylbenzene	Not detected	60		ug/kg	56.4	95-63-6	
sec-Butylbenzene	Not detected	60		ug/kg	56.4	135-98-8	
p-Isopropyltoluene	100	100		ug/kg	56.4	99-87-6	
1,3-Dichlorobenzene	Not detected	100		ug/kg	56.4	541-73-1	
1,4-Dichlorobenzene	Not detected	100		ug/kg	56.4	106-46-7	
1,2-Dichlorobenzene	Not detected	100		ug/kg	56.4	95-50-1	
1,2,3-Trimethylbenzene	Not detected	60		ug/kg	56.4	526-73-8	
n-Butylbenzene	Not detected	60		ug/kg	56.4	104-51-8	

M-Result reported to MDL not RDL

Lab Sample ID: S43774.04 (continued)

Sample Tag: 3b

Volatile Organics 5035, Method: SW5035A/8260C, Run Date: 12/28/22 23:37, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hexachloroethane	Not detected	300		ug/kg	56.4	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	300		ug/kg	56.4	96-12-8	
1,2,4-Trichlorobenzene	Not detected	370		ug/kg	56.4	120-82-1	
1,2,3-Trichlorobenzene	Not detected	370		ug/kg	56.4	87-61-6	
Naphthalene	Not detected	300		ug/kg	56.4	91-20-3	
2-Methylnaphthalene	Not detected	100		ug/kg	56.4	91-57-6	

Lab Sample ID: S43774.05
Sample Tag: 4a
Collected Date/Time: 12/22/2022 08:00
Matrix: Soil
COC Reference: 151452

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	5.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	12/27/22 10:45	JRH	
Pesticides Extraction*	Completed	SW3546	12/27/22 13:00	TAW	
Mercury Digestion	Completed	SW7471B	12/29/22 13:56	CTV	

Inorganics

Method: SM2540B, Run Date: 12/22/22 16:12, Analyst: MAM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	83	1		%	1		

Metals

Method: SW6020A, Run Date: 12/27/22 13:00, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	17.3	0.20		mg/kg	272	7440-38-2	
Barium	598	1.0		mg/kg	272	7440-39-3	
Cadmium	6.50	0.20		mg/kg	272	7440-43-9	
Chromium	24.6	0.50		mg/kg	272	7440-47-3	
Copper	167	0.50		mg/kg	272	7440-50-8	
Lead	966	0.30		mg/kg	272	7439-92-1	
Selenium	1.11	0.40		mg/kg	272	7782-49-2	
Silver	1.33	0.20		mg/kg	272	7440-22-4	
Zinc	2,220	0.50		mg/kg	272	7440-66-6	

Method: SW7471B, Run Date: 12/29/22 15:14, Analyst: CTV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	1.014	0.050		mg/kg	73	7439-97-6	

Organics - PCBs/Pesticides

Organochlorine Pesticides, Method: SW8081B, Run Date: 12/27/22 17:50, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Aldrin	Not detected	20		ug/kg	10	309-00-2	
a-BHC	Not detected	20		ug/kg	10	319-84-6	
b-BHC	Not detected	20		ug/kg	10	319-85-7	
d-BHC	Not detected	20		ug/kg	10	319-86-8	
g-BHC (Lindane)	Not detected	20		ug/kg	10	58-89-9	
Chlordane	Not detected	100		ug/kg	10	57-74-9	
4,4'-DDD	Not detected	20		ug/kg	10	72-54-8	
4,4'-DDE	120	20		ug/kg	10	72-55-9	
4,4'-DDT	80	20		ug/kg	10	50-29-3	
Dieldrin	Not detected	20		ug/kg	10	60-57-1	
Endosulfan I	Not detected	20		ug/kg	10	959-98-8	
Endosulfan II	Not detected	20		ug/kg	10	33213-65-9	
Endosulfan sulfate	Not detected	20		ug/kg	10	1031-07-8	

Lab Sample ID: S43774.05 (continued)

Sample Tag: 4a

Organochlorine Pesticides, Method: SW8081B, Run Date: 12/27/22 17:50, Analyst: JANB (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Endrin	Not detected	20		ug/kg	10	72-20-8	
Endrin aldehyde	Not detected	20		ug/kg	10	7421-93-4	
Heptachlor	Not detected	20		ug/kg	10	76-44-8	
Heptachlor epoxide	Not detected	20		ug/kg	10	1024-57-3	
Methoxychlor	Not detected	50		ug/kg	10	72-43-5	
Toxaphene	Not detected	170		ug/kg	10	8001-35-2	
Endrin Ketone	Not detected	20		ug/kg	10	53494-70-5	

Lab Sample ID: S43774.06
Sample Tag: 5a
Collected Date/Time: 12/22/2022 10:00
Matrix: Soil
COC Reference: 151452

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	4oz Glass	None	Yes	5.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3050B	12/27/22 10:45	JRH	
Extraction, PCB*	Completed	SW3546	12/27/22 13:00	TAW	
Pesticides Extraction*	Completed	SW3546	12/27/22 13:00	TAW	
PNA Extraction*	Completed	SW3546	12/30/22 12:20	JGH	
Mercury Digestion	Completed	SW7471B	12/29/22 13:56	CTV	

Inorganics

Method: SM2540B, Run Date: 12/22/22 16:12, Analyst: MAM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	85	1		%	1		

Metals

Method: SW6020A, Run Date: 12/27/22 13:02, Analyst: JRH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Arsenic	4.65	0.20		mg/kg	248	7440-38-2	
Barium	63.5	1.0		mg/kg	248	7440-39-3	
Cadmium	0.50	0.20		mg/kg	248	7440-43-9	
Chromium	14.2	0.50		mg/kg	248	7440-47-3	
Copper	31.6	0.50		mg/kg	248	7440-50-8	
Lead	164	0.30		mg/kg	248	7439-92-1	
Selenium	Not detected	0.40		mg/kg	248	7782-49-2	
Silver	Not detected	0.20		mg/kg	248	7440-22-4	
Zinc	124	0.50		mg/kg	248	7440-66-6	

Method: SW7471B, Run Date: 12/29/22 15:17, Analyst: CTV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Mercury	0.183	0.050		mg/kg	72	7439-97-6	

Organics - PCBs/Pesticides

Organochlorine Pesticides, Method: SW8081B, Run Date: 12/27/22 18:06, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Aldrin	Not detected	20		ug/kg	10	309-00-2	
a-BHC	Not detected	20		ug/kg	10	319-84-6	
b-BHC	Not detected	20		ug/kg	10	319-85-7	
d-BHC	Not detected	20		ug/kg	10	319-86-8	
g-BHC (Lindane)	Not detected	20		ug/kg	10	58-89-9	
Chlordane	Not detected	100		ug/kg	10	57-74-9	
4,4'-DDD	20	20		ug/kg	10	72-54-8	
4,4'-DDE	20	20		ug/kg	10	72-55-9	
4,4'-DDT	30	20		ug/kg	10	50-29-3	
Dieldrin	Not detected	20		ug/kg	10	60-57-1	
Endosulfan I	Not detected	20		ug/kg	10	959-98-8	

Lab Sample ID: S43774.06 (continued)
Sample Tag: 5a

Organochlorine Pesticides, Method: SW8081B, Run Date: 12/27/22 18:06, Analyst: JANB (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Endosulfan II	20	20		ug/kg	10	33213-65-9	
Endosulfan sulfate	Not detected	20		ug/kg	10	1031-07-8	
Endrin	Not detected	20		ug/kg	10	72-20-8	
Endrin aldehyde	Not detected	20		ug/kg	10	7421-93-4	
Heptachlor	Not detected	20		ug/kg	10	76-44-8	
Heptachlor epoxide	Not detected	20		ug/kg	10	1024-57-3	
Methoxychlor	Not detected	50		ug/kg	10	72-43-5	
Toxaphene	Not detected	170		ug/kg	10	8001-35-2	
Endrin Ketone	Not detected	20		ug/kg	10	53494-70-5	

PCB List, Method: SW8082A, Run Date: 12/27/22 20:12, Analyst: JANB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PCB-1016	Not detected	330		ug/kg	10	12674-11-2	
PCB-1242	Not detected	330		ug/kg	10	53469-21-9	
PCB-1221	Not detected	330		ug/kg	10	11104-28-2	
PCB-1232	Not detected	330		ug/kg	10	11141-16-5	
PCB-1248	Not detected	330		ug/kg	10	12672-29-6	
PCB-1254	Not detected	330		ug/kg	10	11097-69-1	
PCB-1260	400	330		ug/kg	10	11096-82-5	

Organics - Semi-Volatiles

Polynuclear Aromatics, Method: SW8270D, Run Date: 12/30/22 17:00, Analyst: JGH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	300		ug/kg	6	83-32-9	
Acenaphthylene	Not detected	300		ug/kg	6	208-96-8	
Anthracene	Not detected	300		ug/kg	6	120-12-7	
Benzo(a)anthracene	700	300		ug/kg	6	56-55-3	
Benzo(a)pyrene	700	300		ug/kg	6	50-32-8	
Benzo(b)fluoranthene	1,100	300		ug/kg	6	205-99-2	p
Benzo(k)fluoranthene	1,300	300		ug/kg	6	207-08-9	p
Benzo(ghi)perylene	300	300		ug/kg	6	191-24-2	
Chrysene	700	300		ug/kg	6	218-01-9	
Dibenzo(ah)anthracene	Not detected	300		ug/kg	6	53-70-3	
Fluoranthene	1,300	300		ug/kg	6	206-44-0	
Fluorene	Not detected	300		ug/kg	6	86-73-7	
Indeno(1,2,3-cd)pyrene	300	300		ug/kg	6	193-39-5	
Naphthalene	Not detected	300		ug/kg	6	91-20-3	
Phenanthrene	700	300		ug/kg	6	85-01-8	
Pyrene	1,100	300		ug/kg	6	129-00-0	
2-Methylnaphthalene	Not detected	300		ug/kg	6	91-57-6	

p-Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.

Merit Laboratories Login Checklist

Lab Set ID: S43774
Client: MCDOWELL (McDowell & Associates)
Project: 22-16348
Submitted: 12/22/2022 11:55 Login User: MMC

Attention: Jennifer Lagerbohm
Address: McDowell & Associates
21355 Hatcher Avenue
Ferndale, MI 48220

Phone: O:248-399-2066 FAX:
Email: jennifer.lagerbohm@mcdowasc.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.1
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

Merit Laboratories, Inc.
2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1 151452

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Jennifer Lagerbohm
COMPANY: McDowell & Associates
ADDRESS: 21355 Hatcher Ave
CITY: Ferndale STATE: MI ZIP CODE: 48220
PHONE NO.: 248 544-6050 CELL NO.:
E-MAIL ADDRESS: jennifer.lagerbohm@mcdowellassoc.com
P.O. NO.:
QUOTE NO.:
PROJECT NO./NAME: 22-16348
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Jennifer Lagerbohm

INVOICE TO

CONTACT NAME: X SAME
COMPANY:
ADDRESS:
CITY: STATE: ZIP CODE:
PHONE NO.: E-MAIL ADDRESS:

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☒ 3 DAYS ☐ STANDARD ☐ OTHER
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER

MATRIX CODE: W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	10HH	Pesticides	VOCs	PNAs	PCBs
43774.01	12/22/22	0800	2a	S	1	1							X			X	
.02	↓	1000	2a-D	S	1	1							X			X	
.03			3a	S	2	1					1		X		X	X	X
.04			3D	S	2	1					1		X		X		
.05			4a	S	1	1							X	X			
.06	↓	↓	5a	S	1	1							X	X		X	X

RELINQUISHED BY: SIGNATURE/ORGANIZATION	☐ Sampler	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

RELINQUISHED BY: SIGNATURE/ORGANIZATION	DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION	DATE	TIME

SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS
SEAL NO. SEAL INTACT YES ☐ NO ☐ INITIALS

NOTES: TEMP. ON ARRIVAL 5.1

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 1.26.22

Attachment VII

Résumés

Jennifer Lagerbohm, M.S., CHMM
Senior Industrial Hygienist

PROFESSIONAL EXPERIENCE

2001-October 2012; May 2013- Present
McDOWELL & ASSOCIATES, INC.
Senior Industrial Hygienist/Environmental Professional

Current responsibilities include subsurface investigation work plans, sampling soil vapor, soil, and groundwater, interpretation of data, recommendations, and written reports. Also completes Asbestos Surveys, Operations & Maintenance Plans, Lead-Based Paint Investigations, Phase I and Phase II Environmental Site Assessments, Baseline Environmental Assessments, Due Care Plans, remedial and underground storage tank consulting. Responsibilities include overall program management of projects including cost estimates, schedule, reporting, and performance tracking. Responsibilities include soil, soil vapor, sediment, air, and groundwater sampling, interpreting analytical results, compiling data, statistical evaluation of data, and completion of reports.

October 2012 - May 2013
CARDNO ATC
Project Manager/ Environmental Professional

Responsibilities included review and preparation of Phase I Environmental Site Assessments, scope of work development for Phase II Environmental Site Assessments, and due diligence consulting.

EDUCATION

B.S., Environmental Health
Oakland University, College of Arts & Sciences
Rochester Hills, Michigan

M.S., Industrial Hygiene
Wayne State University, Department of Fundamental Sciences
Detroit, Michigan

CERTIFICATIONS

Certified Hazardous Materials Manager (CHMM)- Institute for Hazardous Materials Management
OSHA 29 CFR 1910.120 – Forty-Hour Hazardous Waste Operations and Emergency Response (HAZWOPER)
Certified Lead Inspector/Risk Assessor, Michigan Department of Community Health
Certified Asbestos Building Inspector, Michigan Department of Labor and Economic Growth
Certified Radon Measurement Specialist- National Radon Proficiency Program

Jennifer Lagerbohm, M.S., CHMM
Senior Industrial Hygienist

TRAINING

MAEP & MDEQ Vapor Intrusion Presentation (March 2017)
MDEQ Petroleum Vapor Intrusion Workshop (2013)
PSMJ Project Manager Bootcamp- 2-Day Classroom Training (2012)
Zweig-White Leadership 2011- 1 Day Classroom Training (2011)
ITRC Vapor Intrusion Pathway 2-Day Classroom Training (2011)
ITRC Non-Aqueous Phase Liquid (NAPL) 2-Day Training (2012)
ASTM Vapor Encroachment Screening (E2600-10)
Evaluation of Indoor Inhalation Pathway- Risk Assessment and Management Group, Inc.
Integrated Site Remediation & Vapor Intrusion- Regenesis
MDEQ RRD Cleanup Criteria Training (2007)
Niton X-Ray Fluorescence (XRF) Operations & Radiation Safety
ASTM Risk-Based Corrective Action at Petroleum Sites
Nielsen Environmental Field School- Environmental Sampling
NGWA- Groundwater Flow, Transport, and Remediation
US Department of Transportation Pipeline Emergency Response
Troxler Nuclear Gauge Operations & Radiation Safety
Excavation Competent Person

PROFESSIONAL AFFILIATIONS

Board of Directors (2014- present)- Michigan Association of Environmental Professionals
American Industrial Hygiene Association
American Institute of Professional Geologists

SAMPLE PROJECTS

Existing Drycleaners, Shelby Township, Michigan- Performed coring and hand auger borings for soil sampling. Installed vapor pins to collect soil gas samples for testing to investigate vapor intrusion. Following review of analytical testing, an active soil vapor venting system was designed and installed to facilitate financing for the property owner.

Residential Redevelopment, Novi, Michigan- Performed field screening during soil excavation activities at a former petroleum release. Installed sub-slab vapor pins in nearby buildings to address vapor intrusion. Quarterly sampling of soil gas was conducted and No Further Action (NFA) Reports were submitted to MDEQ for approval of unrestricted residential use.

City of Southfield NSP Program- Asbestos, Lead, Mold, and Radon-assessments for single-family homes throughout the City.

Brush Park, Detroit, Michigan- Completion of multiple Phase I ESAs, Phase II ESAs, remedial consulting, underground storage tank (UST) consulting, asbestos and lead surveys for historic structures.

Apartment Buildings, Southeast Michigan- completion of Phase I ESAs, asbestos surveys, asbestos abatement plans, and operations and maintenance plans for eleven apartment complexes across southeast Michigan.

DOUGLAS M. McDOWELL, M.S., P.E.

DM 2-1-2022

VICE PRESIDENT:

McDowell & Associates, Ferndale, MI
1993 to Present

EDUCATION:

M.S. - Environmental Engineering -
Wayne State University, 1996

United States Military Academy
B.S. General Engineering
West Point, New York, 1986

CERTIFICATIONS and AWARDS:

Licensed Professional Engineer, State of Michigan

OSHA 29 CFR 1910.120 - Forty hour Hazardous Site
Worker Protection and Supervisor

Certified Asbestos Building Inspector, State of Michigan

Certified Storm Water Operator (Industrial),
State of Michigan

Recognized by Dow Chemical Company for Outstanding Contribution to the Contractor Owner Safety Team

Recognized by the West Point Society of Michigan as its Distinguished Graduate in 2016 for contributions to West Point Outreach Efforts through development and implementation of the Urban Leadership Initiative

EXPERIENCE:

1993 to Present — McDowell & Associates, Ferndale, Michigan
Vice President. Direct responsibility for environmental department that completes over 200 Phase I's, 100 Phase II's and 12 BEA's per year. Has completed or supervised completion of over 4000 Phase I's, 1,000 Phase II's, 200 BEA's, and 350 NFAs, Cleanups, Closures, and/or Documentation of Due Care. Oversite of Midland Office.

1992 to 1993 — International Tire Recyclers, Inc., Croswell, MI
Evaluated Pyrolysis and potential for development of tire storage and recycling facility.

1990 to 1992 — Proctor & Gamble, Green Bay, WI
Customer Services
Direct Supervisor of 44 technicians at two plant sites. Responsible for Total Quality Management and development, hazardous chemical management, cost, shipped timeliness, inventory accuracy, productivity, and training. Also responsible for maintenance of a fleet of over 200 vehicles, fuel storage, and site interaction with key customers.

1986 to 1990 — U.S. ARMY - West Germany
Executive Officer, Platoon Leader

PROFESSIONAL MEMBERSHIPS:

ASTM
Michigan Association of Environmental Professionals
Engineering Society of Detroit
American Chemical Society

COMMUNITY SERVICE:

Waza Track Club founder and Director of Coaching – 2006 – present – Nationally competitive AAU and USATF Track Club based in Novi, MI. Multiple national champions.

West Point Society of Michigan - Outreach – 2010 – present – Develop strategy and implement efforts to assist West Point with its Outreach efforts in Detroit and other urban and underprivileged areas in the State of Michigan. Coordinate local West Point Science, Technology, Engineering and Math (STEM) programs, and Leadership and Ethics conferences for Detroit and other Michigan youth. Recognized as the top West Point Outreach programs in the nation. Program has inspired Detroit students to apply for and attend West Point. Leadership Ethics alumni include one Schwarzman Scholar and one Rhodes Scholar each from the City of Detroit.

West Point Field Force – Former Senator Levin and Senator Stabenaw Academy Nomination Review Boards – SE Michigan Congressional Districts - 2010 – 2014. Interview military academy candidates and provide recommendations for nominations to Michigan Senators. Assist West Point Candidates with the academy application process.

West Point Society of Michigan Board Member – Outreach - 2013 – 2015

St. John Lutheran Church – Building Committee, Resource Group Leader – 2003 – 2006

MILITARY SCHOOLING:

1990 Armor Officer Advanced Course
Fort Knox, KY
Sponsor for Kuwaiti Officer under co-op program between U.S. and Kuwait.

1986 Chemical Officer's Course
Fort McClellan, AL
Focused on the hazards associated with radioactive materials and multiple chemical and biological agents, transport mechanisms, characteristics, modelling, and appropriate Personal Protective Equipment.

1986 Airborne School
Fort Benning, GA

1984 Northern Warfare Training Center
Fort Greely, AK
Arctic terrain analysis and navigation

Douglas M. McDowell - Sample Projects

Cul-Mac Industries – Wayne, MI. Operating chemical manufacturing plant with former industrial uses dating to the 1940's. Phase I, Phase II, Limited Asbestos Survey, BEA, Interim Due Care Compliance report, TSCA PCB Remedial Investigation and Cleanup Plan. Work underway to document soil remediation.

Pullman Parc Residential Development – Detroit, MI. Former Pullman Rail Car factory site and former Friend's School site. Phase I's, Phase II's, Asbestos Survey, Geotechnical Investigations, Brownfield Work Plan for State of Michigan Grant Application, witness and document soil remediation, Construction Testing Services, No Further Action Reports. Site awarded $1 Million Grant to conduct remedial activities. No Further Action letter received from EGLE for portion of property. No Further Action letter under review for remainder of property.

Metro International Trade Services / RB Properties – Multiple historic industrial locations, SE Michigan. Phase Is, Phase IIs, BEAs, Documentation of Due Care Reports, Asbestos Surveys, Geotechnical Investigations, Industrial Storm Water consulting, Response Activity Documentation and related reports for multiple remedial projects, Brownfield Plan, Sub-Slab Depressurization System Design, oversee install, verification monitoring.

Golling Dealership Purchases – Multiple locations, SE Michigan. Phase Is, Phase IIs, BEAs, Documentation of Due Care Reports, Sub-Slab Depressurization System Design, oversee install, verification monitoring,

St. Clair River Coastal Wetland Project, Port Huron, MI – St. Clair County Parks and Recreation Commission, Smith Group JJR – Site with industrial history. McDowell & Associates provided environmental consulting to St. Clair County representatives undergoing the acquisition of the property and redevelopment into an interpretive wetlands with nature trails and scenic overlooks.

McDowell responsible to project team to provide environmental consulting including evaluation of existing contaminants and likely impact to future construction plans and future users. Work included Documentation of Due Care Compliance submitted to Michigan Department of Environmental Quality for review.

Wayne County Child Development Center Redevelopment, Northville Township, MI – Toll Brothers, Biltmore Properties, Robertson Brothers - Commercial, Single Family and Multifamily Residential, and Arnold Palmer designed Golf Course. Supervised demolition and clean-up work completed by Wayne County prior to purchase by several developers. Phase I and II Environmental Assessments and Closure Reports. Firm provided Geotechnical Engineering as well as Construction Testing and Quality Control during construction.

Presbyterian Village - Brush Park Redevelopment, Detroit, MI – Presbyterian Villages of Michigan – Phase I, II, and Baseline Environmental Assessments. Firm provided Geotechnical Engineering as well as Construction Testing and Quality Control during construction.

Gem Theatre Relocation and Redevelopment, Detroit, MI – Forbes Management - Phase I, II, and Baseline Environmental Assessments. Firm provided Geotechnical Engineering for evaluation of new foundation and for parking structure as well as Construction Testing and Quality Control during move and construction.

Former Packard and Ford Test Track - Proposed Residential Redevelopment, Shelby Township, MI – Pulte Homes, The Lombardo Companies – Phase I and II Environmental Site Assessments. Firm provided Geotechnical and Hydrogeological Engineering.

International Gospel Center Redevelopment, Ecorse, MI – International Gospel Center – Phase I and II Environmental Assessments, Baseline Environmental Assessments, and Closure Reports. Firm provided Geotechnical Engineering as well as Construction Testing and Quality Control during construction.