

DRAFT
PUBLIC HEALTH IMPLICATIONS OF HAZARDOUS
SUBSTANCES IN THE TWENTY-SIX U.S. GREAT LAKES
AREAS OF CONCERN

Prepared by:

Syracuse Research Corporation
Under Contract No. 205-1999-00024

Prepared for:

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry

April 2004

CONTRIBUTORS/AUTHORS

Agency for Toxic Substances and Disease Registry, Atlanta, GA:

William Cibulas, Ph.D.
Christopher De Rosa, Ph.D.
Heraline Hicks, Ph.D.
Larry Cseh, M.S.A.
Ira Hubert
Monty Howie, M.S.
William Henriques, Ph.D.
Andrew Dent, M.A., MBA
Annette Ashizawa, Ph.D.
Melissa Massaro, M.A.
Justin Bragg

Centers for Disease Control and Prevention, Atlanta, GA:

Janna Brooks, M.A.

Syracuse Research Corporation, Syracuse, NY:

Joan Colman, Ph.D.
D. Anthony Gray, Ph.D.

TABLE OF CONTENTS

CONTRIBUTORS/AUTHORS	ii
TABLE OF CONTENTS	iii
ALPHABETICAL LIST OF AOCs	x
LIST OF TABLES	xii
LIST OF TABLES	xii
LIST OF ACRONYMS	xv
1. INTRODUCTION	1
1.1 ATSDR PUBLIC HEALTH ASSESSMENTS FOR THE 26 GREAT LAKES AOCs	4
1.2 TRI DATA FOR THE 26 GREAT LAKES AOCs	5
1.3 COUNTY HEALTH OUTCOME DATA FOR THE 26 GREAT LAKES AOCs	5
2. LAKE ONTARIO	6
2.1 OSWEGO RIVER AOC, OSWEGO COUNTY, NY	6
2.1.1 Hazardous Waste Sites Relevant to the Oswego River AOC	6
2.1.1.1 Fulton Terminals	6
2.1.1.2 Pollution Abatement Services	7
2.1.1.3 Volney Municipal Landfill, Volney, Oswego County, NY	8
2.1.2 TRI Data for the Oswego River AOC	9
2.1.3 County Demographics and Health Status Data for the Oswego River AOC	10
2.1.4 Summary and Conclusions for the Oswego River AOC	10
2.1.4.1 Hazardous Waste Sites	10
2.1.4.2 TRI Data	10
2.1.4.3 County Health Data Indicators	11
2.2 ROCHESTER EMBAYMENT AOC, MONROE COUNTY, NY	16
2.2.1 Hazardous Waste Sites Relevant to the Rochester Embayment AOC	16
2.2.1.1 Rochester City of – APCO Site (Former APCO Property Brownfield Site)	16
2.2.2 TRI Data for the Rochester Embayment AOC	17
2.2.3 County Demographics and Health Status Data for the Rochester Embayment AOC	17
2.2.4 Summary and Conclusions for the Rochester Embayment AOC	18
2.2.4.1 Hazardous Waste Sites	18
2.2.4.2 TRI Data	18
2.2.4.3 County Demographics and Health Status Indicators	18
2.3 EIGHTEEN MILE CREEK AOC, NIAGARA COUNTY, NY	24
2.3.1 Hazardous Waste Sites Relevant to the Eighteen Mile Creek AOC	24
2.3.1.1 Barker Chemical	25
2.3.2 TRI Data for the Eighteen Mile Creek AOC	25
2.3.3 County Demographics and Health Status Data for the Eighteen Mile Creek AOC	26
2.3.4 Summary and Conclusions for the Eighteen Mile Creek AOC	26
2.3.4.1 Hazardous Waste Sites	26
2.3.4.2 TRI Data	27
2.3.4.3 County Demographics and Health Status Indicators	27
3. LAKE ERIE	32
3.1 BUFFALO RIVER AOC, ERIE COUNTY, NY	32
3.1.1 Hazardous Waste Sites Relevant to the Buffalo River AOC	32
3.1.1.1 Abby Street/Hickory Woods Subdivision	33
3.1.1.2 Diarsenol Company (Kingsley Park)	34
3.1.1.3 Ernst Steel Site	35
3.1.1.4 Newstead Site	35

3.1.1.5	Pfohl Brothers Landfill.....	36
3.1.2	TRI Data for the Buffalo River AOC.....	37
3.1.3	County Demographics and Health Status Data for the Buffalo River AOC.....	38
3.1.4	Summary and Conclusions for the Buffalo River AOC, Erie County, NY.....	38
3.1.4.1	Hazardous Waste Sites.....	38
3.1.4.2	TRI Data.....	39
3.1.4.2	County Demographics and Health Status Indicators.....	39
3.2	PRESQUE ISLE BAY AOC, ERIE COUNTY, PA.....	46
3.2.1	Hazardous Waste Sites Relevant to the Presque Isle Bay AOC.....	46
3.2.1.1	Foamex Products Site (Corry Area Middle-High School).....	46
3.2.1.2	Hammermill – Scott Run Site.....	47
3.2.1.3	Lord Shope Landfill.....	48
3.2.1.4	Mill Creek Dump.....	49
3.2.2	TRI Data for the Presque Isle Bay AOC, Erie County, PA.....	50
3.2.3	County Demographics and Health Status Data for the Presque Bay AOC.....	50
3.2.4	Summary and Conclusions for the Presque Isle Bay AOC, Erie County, PA.....	51
3.2.4.1	Hazardous Waste Sites.....	51
3.2.4.2	TRI Data.....	51
3.2.4.3	County Demographics and Health Status Indicators.....	51
3.3	ASHTABULA RIVER AOC, ASHTABULA COUNTY, OH.....	56
3.3.1	Hazardous Waste Sites Relevant to the Ashtabula River AOC.....	56
3.3.1.1	Big D Campground.....	57
3.3.1.2	Fields Brook.....	57
3.3.1.3	Laskin Poplar Oil.....	58
3.3.1.4	New Lyme Landfill.....	59
3.3.2	TRI Data for Ashtabula River AOC, Ashtabula County, OH.....	60
3.3.3	County Demographics and Health Status Data for the Ashtabula River AOC.....	60
3.3.4	Summary and Conclusions for the Ashtabula River AOC.....	61
3.3.4.1	Hazardous Waste Sites.....	61
3.3.4.2	TRI Data.....	61
3.3.4.3	County Demographics and Health Status Indicators.....	61
3.4	CUYAHOGA RIVER AOC, CUYAHOGA AND SUMMIT COUNTIES, OH.....	66
3.4.1	Hazardous Waste Sites Relevant to the Cuyahoga River AOC.....	66
3.4.1.1	Cady Road, Cuyahoga County, OH.....	66
3.4.2	TRI Data for the Cuyahoga AOC, Cuyahoga and Summit Counties, OH.....	67
3.4.3	County Demographics and Health Status Data for the Cuyahoga River AOC.....	68
3.4.4	Summary and Conclusions for the Cuyahoga River.....	69
3.4.4.1	Hazardous Waste Sites.....	69
3.4.4.2	TRI Data.....	69
3.4.4.3	County Demographics and Health Status Indicators.....	69
3.5	BLACK RIVER AOC, LORAIN COUNTY, OH.....	76
3.5.1	Hazardous Waste Sites Relevant to the Black River AOC, Lorain County OH.....	76
3.5.1.1	Ford Road Industrial Landfill.....	76
3.5.1.2	Republic Steel Corp. Quarry.....	77
3.5.2	TRI Data for the Black River AOC.....	78
3.5.3	County Demographic and Health Status Data for the Black River AOC.....	78
3.5.4	Summary and Conclusions for the Black River AOC, Lorain County, OH.....	79
3.5.4.1	Hazardous Waste Sites.....	79
3.5.4.2	TRI Data.....	80
3.5.4.3	County Demographics and Health Status Indicators.....	80

3.6	MAUMEE RIVER AOC, LUCAS, OTTAWA, AND WOOD COUNTIES, OH.....	86
3.6.1	Hazardous Waste Sites Relevant to the Maumee River AOC.....	86
3.6.2	TRI Data for the Maumee River AOC.....	86
3.6.3	County Demographics and Health Status Data for the Maumee River AOC	87
3.6.4	Summary and Conclusions for the Maumee River AOC	88
3.6.4.1	Hazardous Waste Sites	88
3.6.4.2	TRI Data.....	88
3.6.4.3	County Demographics and Health Status Indicators.....	88
3.7	RIVER RAISIN AOC, MONROE COUNTY, MI	92
3.7.1	Hazardous Waste Sites Relevant to the River Raisin AOC	92
3.7.1.1	Consolidated Packaging Corp.	92
3.7.2	TRI Data for the River Raisin AOC.....	93
3.7.3	County Demographics and Health Status Data for the River Raisin AOC	94
3.7.4	Summary and Conclusions for the River Raisin AOC, Monroe County, MI.....	94
3.7.4.1	Hazardous Waste Sites	94
3.7.4.2	TRI Data.....	95
3.7.4.3	County Demographics and Health Status Indicators.....	95
3.8	ROUGE RIVER AOC, WAYNE AND OAKLAND COUNTIES, MI.....	99
3.8.1	Hazardous Waste Sites Relevant to the Rouge River AOC	99
3.8.1.1	Carter Industrials, Inc.	100
3.8.1.2	Ford Motor Co. Allen Part Clay Mine.....	101
3.8.1.3	Gratiot Trailer Park.....	103
3.8.1.4	Joy Road Dump/Holiday Park/Holiday Nature Preserve	103
3.8.1.5	Lower Ecorse Creek Dump	104
3.8.1.6	Master Metals Inc. #2	105
3.8.1.7	Packard Plant.....	105
3.8.1.8	Proposed Beard Street School/New Beard Elementary School.....	106
3.8.1.9	Wholesale Russell/Mack	107
3.8.1.10	Old World Trade Center.....	107
3.8.1.11	Cemetery Dump.....	108
3.8.1.12	Continental Aluminum Company.....	108
3.8.1.13	Hi-Mill Manufacturing Company.....	109
3.8.1.14	J & L Landfill	110
3.8.1.15	Rose Township Dump	111
3.8.1.16	Springfield Township Dump	112
3.8.2	TRI Data for the Rouge River AOC.....	113
3.8.3	County Demographics and Health Status Data for the Rouge River AOC	113
3.8.4	Summary and Conclusions for the Rouge River AOC.....	114
3.8.4.1	Hazardous Waste Sites	114
3.8.4.2	TRI Data.....	115
3.8.4.3	County Demographics and Health Status Indicators.....	116
3.9	CLINTON RIVER AOC, OAKLAND AND MACOMB COUNTIES, MI.....	125
3.9.1	Hazardous Waste Sites Relevant to the Clinton River AOC.....	125
3.9.1.1	G & H Landfill	126
3.9.1.2	Liquid Disposal, Inc.	127
3.9.1.3	South Macomb Disposal Authority	128
3.9.2	TRI Data for the Clinton River AOC	129
3.9.3	County Demographics and Health Status Data for the Clinton River AOC	129
3.9.4	Summary and Conclusions for the Clinton River AOC.....	130
3.9.4.1	Hazardous Waste Sites	130
3.9.4.2	TRI Data.....	131

3.9.4.3	County Demographics and Health Status Indicators	131
4.	LAKE HURON.....	137
4.1	SAGINAW RIVER AND BAY AOC	137
4.1.1	Hazardous Waste Sites Relevant to the Saginaw River and Bay AOC.....	137
4.1.1.1	Bay City Middlegrounds	137
4.1.1.2	Keit Property	139
4.1.1.3	Clare Water Supply	140
4.1.1.4	Berlin and Farrow.....	141
4.1.1.5	Forest Waste Products	142
4.1.1.6	Gratiot County Landfill.....	143
4.1.1.7	Velsicol Chemical	143
4.1.1.8	Hedblum Industries	144
4.1.1.9	Metamora Landfill.....	145
4.1.1.10	Spiegelberg and Rasmussen Dump Sites.....	146
4.1.1.11	Shiawassee River.....	147
4.1.1.12	Dow Chemical Co., Michigan Division, Midland Location.....	148
4.1.1.13	Tittabawassee River.....	149
4.1.1.14	Lufkin Rule.....	150
4.1.1.15	Laingsburg.....	151
4.1.2	TRI Data for the Saginaw River and Bay AOC	151
4.1.3	County Demographics and Health Status Data for the Saginaw River and Bay AOC	152
4.1.4	Summary and Conclusions for the Saginaw River and Bay AOC	152
4.1.4.1	Hazardous Waste Sites	152
4.1.4.2	TRI Data	153
4.1.4.3	County Demographics and Health Status Indicators	153
5.	LAKE MICHIGAN	162
5.1	MUSKEGON LAKE AOC AND WHITE LAKE AOC, MUSKEGON COUNTY, MI ...	162
5.1.1	Hazardous Waste Sites Relevant to the Muskegon Lake and White Lake AOCs.....	162
5.1.1.1	Bofors Nobel Incorporated	162
5.1.1.2	Duell & Gardner Landfill	165
5.1.1.3	E.I. Du Pont De Nemours & Col., Inc., Montague Plant.....	166
5.1.1.4	Hooker (Montague Plant)	167
5.1.1.5	Muskegon Chemical Company	167
5.1.1.6	Ott/Story/Cordova Chemical Co.	168
5.1.1.7	Peerless Plating.....	169
5.1.1.8	Ruddiman Drain Area (Ruddiman Creek Area).....	170
5.1.1.9	SCA Independent Landfill.....	171
5.1.1.10	Thermo-Chem Incorporated	172
5.1.1.11	Whitehall Municipal Wells.....	173
5.1.2	TRI Data for the White Lake AOC and Muskegon AOC	173
5.1.3	County Demographics and Health Status Data for the Muskegon Lake and White Lake AOCs.....	174
5.1.4	Summary and Conclusions for the Muskegon Lake AOC and White Lake AOC	174
5.1.4.1	Hazardous Waste Sites	174
5.1.4.2	TRI Data	175
5.1.4.3	County Demographics and Health Status Indicators	175
5.2	KALAMAZOO RIVER AOC, ALLEGAN AND KALAMAZOO COUNTIES, MI.....	183
5.2.1	Hazardous Waste Sites Relevant to the Kalamazoo River AOC	183
5.2.1.1	Rockwell International Corp.	184
5.2.1.2	Allied Paper/Portage Creek/Kalamazoo River	185
5.2.1.3	Auto Ion Chemicals, Inc.....	185

5.2.1.4	K & L Landfill.....	186
5.2.1.5	Michigan Disposal Service.....	187
5.2.1.6	Roto-Finish Company	188
5.2.2	TRI Data for the Kalamazoo River AOC.....	189
5.2.3	County Demographics and Health Status Data for the Kalamazoo River AOC	189
5.2.4	Summary and Conclusions for the Kalamazoo River AOC.....	190
5.2.4.1	Hazardous Waste Sites	190
5.2.4.2	TRI Data.....	191
5.3	GRAND CALUMET AOC, LAKE COUNTY, IN, AND COOK COUNTY, IL.....	196
5.3.1	Hazardous Waste Sites Relevant to the Grand Calumet AOC.....	196
5.3.1.1	American Chemical Services, Inc.	197
5.3.1.2	Sandy Jo Landfill.....	198
5.3.1.3	Midco I.....	199
5.3.1.4	Midco II.....	199
5.3.1.5	Ninth Avenue Dump.....	200
5.3.1.6	U.S. Smelter and Lead Refinery, Inc.....	201
5.3.1.7	Celotex Corp.....	202
5.3.1.8	Double A Metals.....	203
5.3.1.9	Electro Finishers.....	203
5.3.1.10	Elizabeth Street Foundry	204
5.3.1.11	Estech General Chemical Co.....	205
5.3.1.12	Hartz Construction.....	205
5.3.1.13	Stauffer Chemical Company	206
5.3.1.14	West Pullman Iron & Metal.....	206
5.3.2	TRI Data for the Grand Calumet AOC	207
5.3.3	County Demographics and Health Status Data for the Grand Calumet AOC.....	208
5.3.4	Summary and Conclusions for the Grand Calumet AOC	209
5.3.4.1	Hazardous Waste Sites	209
5.3.4.2	TRI Data	210
5.3.4.3	County Demographics and Health Status Indicators.....	210
5.4	WAUKEGAN HARBOR AOC, LAKE COUNTY, IL.....	220
5.4.1	Hazardous Waste Sites Relevant to the Waukegan Harbor AOC.....	220
5.4.1.1	Diamond Scrap Yard	221
5.4.1.2	H.O.D. Landfill.....	221
5.4.1.3	Johns-Manville Disposal Area.....	222
5.4.1.4	Outboard Marine Corp.	223
5.4.1.5	Precision Chrome, Inc.	224
5.4.1.6	Yeoman Creek Landfill	225
5.4.2	TRI Data for the Waukegan Harbor AOC.....	226
5.4.3	County Demographics and Health Status Data for the Waukegan Harbor AOC.....	226
5.4.4	Summary and Conclusions for the Waukegan Harbor AOC.....	227
5.4.4.1	Hazardous Waste Sites	227
5.4.4.2	TRI Data.....	227
5.4.4.3	County Demographics and Health Status Indicators.....	228
5.5	MILWAUKEE ESTUARY AOC, MILWAUKEE COUNTY, WI.....	235
5.5.1	Hazardous Waste Sites Relevant to the Milwaukee Estuary AOC	235
5.5.1.1	Boerke Property.....	236
5.5.1.2	Fadrowski Drum Disposal	236
5.5.1.3	Former Tannery	237
5.5.1.4	Moss-American Co., Inc. (Kerr-McGee Oil Co.).....	238
5.5.1.5	Northwestern Barrel (Former), (Marina Cliffs).....	239

5.5.1.6	P&G School Bus Service.....	240
5.5.1.7	Robert Betz Trust Co. (Betz, Robert G. Property)	241
5.5.1.8	St. Francis Auto Wreckers.....	241
5.5.1.9	Try Chemical Corp.	242
5.5.2	TRI Data for the Milwaukee Estuary AOC.....	243
5.5.3	County Demographics and Health Status Data for the Milwaukee Estuary AOC	243
5.5.4	Summary and Conclusions for the Milwaukee Estuary AOC.....	244
5.5.4.1	Hazardous Waste Sites	244
5.5.4.2	TRI Data	244
5.5.4.3	County Demographics and Health Status Indicators.....	245
5.6	SHEBOYGAN RIVER AOC, SHEBOYGAN COUNTY, WI	253
5.6.1	Hazardous Waste Sites Relevant to the Sheboygan River AOC.....	253
5.6.1.1	Kohler Company Landfill.....	253
5.6.1.2	Sheboygan Harbor & River	255
5.6.2	TRI Data for the Sheboygan River AOC	256
5.6.3	County Demographics and Health Status Data for the Sheboygan River AOC.....	256
5.6.4	Summary and Conclusions for the Sheboygan River AOC	256
5.6.4.1	Hazardous Waste Sites	256
5.6.4.2	TRI Data	257
5.6.4.3	County Demographics and Health Status Indicators.....	257
5.7	LOWER GREEN BAY AND FOX RIVER AOC (FOX RIVER/SOUTHERN GREEN BAY AOC), BROWN COUNTY, WI.....	262
5.7.1	Hazardous Waste Sites Relevant to the Sheboygan River AOC.....	262
5.7.1.1	Better Brite Plating Co.	262
5.7.1.2	Fox River NRDA/PCB Releases	263
5.7.2	TRI Data for the Lower Green Bay and Fox River AOC	264
5.7.3	County Demographics and Health Status Data for the Lower Green Bay and Fox River AOC	264
5.7.4	Summary and Conclusions for the Lower Green Bay and Fox River AOC	265
5.7.4.1	Hazardous Waste Sites	265
5.7.4.2	TRI Data	265
5.7.4.3	County Demographics and Health Status Indicators.....	266
5.8	MENOMINEE RIVER AOC, MENOMINEE COUNTY, MI AND MARINETTE COUNTY, WI.....	270
5.8.1	Hazardous Waste Sites Relevant to the Menominee River AOC.....	270
5.8.2	TRI Data for the Menominee River AOC.....	270
5.8.3	County Demographics and Health Status Data for the Menominee River AOC	270
5.8.4	Summary and Conclusions for the Menominee River AOC	271
5.8.4.1	Hazardous Waste Sites	271
5.8.4.2	TRI Data	271
5.8.4.3	County Demographics and Health Status Indicators.....	271
5.9	MANISTIQUE RIVER AOC, SCHOOLCRAFT COUNTY, MI	274
5.9.1	Hazardous Waste Sites Relevant to the Manistique River AOC.....	274
5.9.2	TRI Data for the Manistique River AOC	274
5.9.3	County Demographics and Health Status Data for the Manistique River AOC	274
5.9.4	Summary and Conclusions for the Manistique River AOC	275
5.9.4.1	Hazardous Waste Sites	275
5.9.4.2	TRI Data	275
5.9.4.3	County Demographics and Health Status Indicators.....	275
6.	LAKE SUPERIOR.....	276
6.1	DEER LAKE AOC, MARQUETTE COUNTY, MI	276

6.1.1	Hazardous Waste Sites Relevant to the Deer Lake AOC.....	276
6.1.1.1	Cliff/Dow Dump.....	276
6.1.2	TRI Data for the Deer Lake AOC	277
6.1.3	County Demographics and Health Status Data for the Deer Lake AOC	277
6.1.4	Summary and Conclusions for the Deer Lake AOC	278
6.1.4.1	Hazardous Waste Sites	278
6.1.4.2	TRI Data.....	278
6.1.4.3	County Demographics and Health Status Indicators.....	278
6.2	TORCH LAKE AOC, HOUGHTON COUNTY, MI.....	282
6.2.1	Hazardous Waste Sites Relevant to the Torch Lake AOC.....	282
6.2.1.1	Torch Lake.....	282
6.2.2	TRI Data for the Torch Lake AOC	283
6.2.3	County Demographics and Health Status Data for the Torch Lake AOC.....	284
6.2.4	Summary and Conclusions for the Torch Lake AOC	284
6.2.4.1	Hazardous Waste Sites	284
6.2.4.2	TRI Data.....	284
6.2.4.3	County Demographics and Health Status Indicators.....	285
6.3	ST. LOUIS RIVER AND BAY AOC, ST. LOUIS AND CARLTON COUNTIES, MN AND DOUGLAS COUNTY, WI.....	289
6.3.1	Hazardous Waste Sites Relevant to the St. Louis River and Bay AOC.....	289
6.3.1.1	Arrowhead Refinery Company.....	289
6.3.1.2	St. Louis River Site.....	290
6.3.1.1	Koppers Company Superior Plant.....	291
6.3.2	TRI Data for the St. Louis River and Bay AOC	292
6.3.3	County Demographics and Health Status Data for the St. Louis River and Bay AOC.....	292
6.3.4	Summary and Conclusions for the St. Louis River and Bay AOC	293
6.3.4.1	Hazardous Waste Sites	293
6.3.4.2	TRI Data.....	294
6.3.4.3	County Demographics and Health Status Indicators.....	294
7.	CONCLUSIONS.....	300
7.1	ATSDR PUBLIC HEALTH ASSESSMENTS FOR THE 26 GREAT LAKES AOCs	300
7.2	TRI DATA FOR THE 26 U.S. GREAT LAKES AOCs	302
7.3	POSSIBLE ASSOCIATIONS	303
8.	SOURCES OF INFORMATION.....	305

ALPHABETICAL LIST OF AOCs

ASHTABULA RIVER AOC, ASHTABULA COUNTY, OH	56
BLACK RIVER AOC, LORAIN COUNTY, OH	76
BUFFALO RIVER AOC, ERIE COUNTY, NY	32
CLINTON RIVER AOC, OAKLAND AND MACOMB COUNTIES, MI.....	125
CUYAHOGA RIVER AOC, CUYAHOGA AND SUMMIT COUNTIES, OH	66
DEER LAKE AOC, MARQUETTE COUNTY, MI.....	276
EIGHTEEN MILE CREEK AOC, NIAGARA COUNTY, NY	24
GRAND CALUMET AOC, LAKE COUNTY, IN, AND COOK COUNTY, IL.....	196
KALAMAZOO RIVER AOC, ALLEGAN AND KALAMAZOO COUNTIES, MI.....	183
LOWER GREEN BAY AND FOX RIVER AOC (FOX RIVER/SOUTHERN GREEN BAY AOC), BROWN COUNTY, WI.....	262
MANISTIQUE RIVER AOC, SCHOOLCRAFT COUNTY, MI	274
MAUMEE RIVER AOC, LUCAS, OTTAWA, AND WOOD COUNTIES, OH.....	86
MENOMINEE RIVER AOC, MENOMINEE COUNTY, MI AND MARINETTE COUNTY, WI.....	270
MILWAUKEE ESTUARY AOC, MILWAUKEE COUNTY, WI.....	235
MUSKEGON LAKE AOC AND WHITE LAKE AOC, MUSKEGON COUNTY, MI	162
OSWEGO RIVER AOC, OSWEGO COUNTY, NY	6
PRESQUE ISLE BAY AOC, ERIE COUNTY, PA	46
RIVER RAISIN AOC, MONROE COUNTY, MI	92
ROCHESTER EMBAYMENT AOC, MONROE COUNTY, NY	16
ROUGE RIVER AOC, WAYNE AND OAKLAND COUNTIES, MI.....	99
SAGINAW RIVER AND BAY AOC	137
SHEBOYGAN RIVER AOC, SHEBOYGAN COUNTY, WI	253
ST. LOUIS RIVER AND BAY AOC, ST. LOUIS AND CARLTON COUNTIES, MN AND DOUGLAS COUNTY WI.....	289

TORCH LAKE AOC, HOUGHTON COUNTY, MI..... 282

WAUKEGAN HARBOR AOC, LAKE COUNTY, IL..... 220

WHITE LAKE AOC, MUSKEGON COUNTY, MI..... 160

LIST OF TABLES

1-1. International Joint Commission (IJC) Great Lakes 11 Critical Pollutants	1
1-2. Public Health Hazard Conclusion Categories.....	4
2-1. Hazardous Waste Sites in Oswego County, NY.....	6
2-2. Waste Site Contaminants that Exceeded Health-Based Screening Values—Oswego River AOC	12
2-3. TRI Releases (in pounds, 2001) for the Oswego River AOC.....	14
2-4. TRI Facilities Releasing IJC Critical Pollutants On-site for the Oswego River AOC	15
2-5. Hazardous Waste Sites in Monroe County, NY	16
2-6. Waste site Contaminants that Exceeded Health-Based Screening Values—Rochester Embayment AOC	20
2-7. TRI Releases (in pounds, 2001) for the Rochester Embayment AOC	21
2-8. TRI Facilities Releasing IJC Critical Pollutants On-site for the Rochester Embayment AOC	23
2-9. Hazardous Waste Sites in Niagara County, NY, Relevant to Eighteen Mile Creek AOC	24
2-10. Waste Site Contaminants that Exceeded Health-Based Screening Values—Eighteen Mile Creek AOC	28
2-11. TRI Releases (in pounds, 2001) for the Eighteen Mile Creek AOC	29
2-12. TRI Facilities Releasing IJC Critical Pollutants On-site for the Eighteen Mile Creek AOC	31
3-1. Hazardous Waste Sites in Erie County, NY	32
3-2. Waste Sites Contaminants that Exceeded Health-Based Screening Values—Buffalo River AOC....	40
3-3. TRI Releases (in pounds, 2001) for the Buffalo River AOC.....	43
3-4. TRI Facilities Releasing IJC Critical Pollutants On-site for the Buffalo River AOC	45
3-5. Hazardous Waste Sites in Erie County, PA.....	46
3-6. Waste Site Contaminants that Exceeded Health-Based Screening Values—Presque Isle Bay AOC.....	52
3-7. TRI Releases (in pounds, 2001) for Presque Isle Bay AOC.....	53
3-8. TRI Facilities Releasing IJC Critical Pollutants On-site for the Presque Isle Bay AOC.....	55
3-9. Hazardous Waste Sites in Ashtabula County, OH.....	56
3-10. Waste Site Contaminants that Exceeded Health-Based Screening Values—Ashtabula River AOC	62
3-11. TRI Releases (in pounds, 2001) for the Ashtabula River AOC.....	64
3-12. TRI Facilities Releasing IJC Critical Pollutants On-site for the Ashtabula River AOC	65
3-13. Hazardous Waste Sites in Cuyahoga and Summit Counties, OH.....	66
3-14. Waste Site Contaminants that Exceeded Health-Based Screening Values—Cuyahoga River AOC	70
3-15. TRI Releases (in pounds, 2001) for the Cuyahoga River AOC.....	72
3-16. TRI Facilities Releasing IJC Critical Pollutants On-site for the Cuyahoga River AOC	74
3-17. County Demographic Profiles for the Cuyahoga River AOC	68
3-18. Hazardous Waste Sites in Lorain County, OH	76
3-19. Waste Site Contaminants that Exceeded Health-Based Screening Values—Black River AOC	81
3-20. TRI Releases (in pounds, 2001) for the Black River AOC	83
3-21. TRI Facilities Releasing IJC Critical Pollutants On-site for the Black River AOC	85
3-22. Hazardous Waste Sites in Lucas, Ottawa, and Wood Counties, OH.....	86
3-23. TRI Releases (in pounds, 2001) for the Maumee River AOC.....	89
3-24. TRI Facilities Releasing IJC Critical Pollutants On-site for the Maumee River AOC.....	91
3-25. County Demographic Profiles for the Maumee River AOC.....	87
3-26. Hazardous Waste Sites in Monroe County, MI	92
3-27. Waste Site Contaminants that Exceeded Health-Based Screening Values—River Raisin AOC	96
3-28. TRI Releases (in pounds, 2001) for the River Raisin AOC.....	97
3-29. TRI Facilities Releasing IJC Critical Pollutants On-site for the River Raisin AOC	98
3-30. Hazardous Waste Sites in Wayne County, MI	99

3-31. Hazardous Waste Sites in Oakland County, MI	100
3-32. Waste Site Contaminants that Exceeded Health-Based Screening Values—Rouge River AOC ...	117
3-33. TRI Releases (in pounds, 2001) for the Rouge River AOC	120
3-34. TRI Facilities Releasing IJC Critical Pollutants On-site for the Rouge River AOC	123
3-35. County Demographic Profiles for the Rouge River AOC	113
3-36. Hazardous Waste Sites in Oakland County, MI	125
3-37. Hazardous Waste Sites in Macomb County, MI.....	126
3-38. Waste Site Contaminants that Exceeded Health-Based Screening Values—Clinton River AOC	132
3-39. TRI Releases (in pounds, 2001) for the Clinton River AOC.....	134
3-40. TRI Facilities Releasing IJC Critical Pollutants On-site for the Clinton River AOC.....	136
3-41. County Demographic Profiles for the Maumee River AOC.....	130
4-1. Hazardous Waste Sites in Counties Relevant to the Saginaw River and Bay AOC.....	138
4-2. Waste Site Contaminants that Exceeded Health-Based Screening Values—Saginaw River and Bay AOC.....	154
4-3. TRI Releases (in pounds, 2001) for the Saginaw River and Bay AOC.....	157
4-4. TRI Facilities Releasing IJC Critical Pollutants On-site for the Saginaw River and Bay AOC.....	159
4-5. County Health Status Indicators that Compared Unfavorably with U.S. Indicators and with the Median of the Peer Counties—Saginaw River and Bay AOC.....	160
5-1. Hazardous Waste Sites in Muskegon County, MI.....	163
5-2. Waste Site Contaminants that Exceeded Health-Based Screening Values—Muskegon Lake and White Lake AOCs.....	177
5-3. TRI Releases (in pounds, 2001) for Muskegon Lake and White Lake AOCs.....	180
5-4. TRI Facilities Releasing IJC Critical Pollutants On-site for the Muskegon Lake and White Lake AOCs	182
5-5. Hazardous Waste Sites in Allegan and Kalamazoo Counties, MI.....	183
5-6. Waste Site Contaminants that Exceeded Health-Based Screening Values—Kalamazoo River AOC	192
5-7. TRI Releases (in pounds, 2001) for the Kalamazoo River AOC.....	194
5-8. TRI Facilities Releasing IJC Critical Pollutants On-site for the Kalamazoo River AOC	195
5-9. County Demographic Profiles for the Kalamazoo River AOC	189
5-10. Hazardous Waste Sites in Lake County, IN, and Cook County, IL.....	196
5-11. Waste Site Contaminants that Exceeded Health-Based Screening Values—Grand Calumet AOC.....	211
5-12. TRI Releases (in pounds, 2001) for the Grand Calumet AOC	214
5-13. TRI Facilities Releasing IJC Critical Pollutants On-site for the Grand Calumet AOC.....	217
5-14. County Demographic Profiles for the Grand Calumet AOC	208
5-15. Hazardous Waste Sites in Lake County, IL.....	220
5-16. Waste Site Contaminants that Exceeded Health-Based Screening Values—Waukegan Harbor AOC.....	229
5-17. TRI Releases (in pounds, 2001) for the Waukegan Harbor AOC	232
5-18. TRI Facilities Releasing IJC Critical Pollutants On-site for the Waukegan Harbor AOC	234
5-19. Hazardous Waste Sites in Milwaukee County, WI.....	235
5-20. Waste Site Contaminants that Exceeded Health-Based Screening Values—Milwaukee Estuary AOC.....	246
5-21. TRI Releases (in pounds, 2001) for the Milwaukee Estuary AOC.....	250
5-22. TRI Facilities Releasing IJC Critical Pollutants On-site for the Milwaukee Estuary AOC	252
5-23. Hazardous Waste Sites in Sheboygan County, WI.....	253
5-24. Waste Site Contaminants that Exceeded Health-Based Screening Values—Sheboygan River AOC	258
5-25. TRI Releases (in pounds, 2001) for the Sheboygan River AOC	260

5-26. TRI Facilities Releasing IJC Critical Pollutants On-site for the Sheboygan River AOC.....	261
5-27. Hazardous Waste Sites in Muskegon County, MI.....	262
5-28. Waste Site Contaminants that Exceeded Health-Based Screening Values—Lower Green Bay and Fox River AOC	267
5-29. TRI Releases (in pounds, 2001) for the Lower Green Bay and Fox River AOC	268
5-30. TRI Facilities Releasing IJC Critical Pollutants On-site for the Lower Green Bay and Fox River AOC	269
5-31. TRI Releases (in pounds, 2001) for the Menominee River AOC.....	272
5-32. TRI Facilities Releasing IJC Critical Pollutants On-site for the Menominee River AOC	273
5-33. County Demographic Profiles for the Menominee River AOC.....	270
6-1. Hazardous Waste Sites in Marquette County, MI	276
6-2. Waste Site Contaminants that Exceeded Health-Based Screening Values—Deer Lake AOC.....	279
6-3. TRI Releases (in pounds, 2001) for the Deer Lake AOC.....	280
6-4. TRI Facilities Releasing IJC Critical Pollutants On-site for the Deer Lake AOC.....	281
6-5. Hazardous Waste Sites in Houghton County, MI.....	282
6-6. Waste Site Contaminants that Exceeded Health-Based Screening Values—Torch Lake AOC.....	286
6-7. TRI Releases (in pounds, 2001) for the Torch Lake AOC	287
6-8. TRI Facilities Releasing IJC Critical Pollutants On-site for the Torch Lake AOC.....	288
6-9. Hazardous Waste Sites in St. Louis and Carlton Counties, MN, and Douglas County, WI.....	289
6-10. Waste Site Contaminants that Exceeded Health-Based Screening Values—St. Louis River and Bay AOC.....	295
6-11. TRI Releases (in pounds, 2001) for the St. Louis River and Bay AOC	298
6-12. TRI Facilities Releasing IJC Critical Pollutants On-site for the St. Louis River and Bay AOC....	299
6-13. County Demographic Profiles for the St. Louis River and Bay AOC	292
7-1. TRI Releases of IJC Critical Pollutants in the 26 U.S. AOCs	304
8-1. Cited ATSDR Health Assessments and Consultations and EPA Fact Sheets and RODs by Section in Document.....	306
8-2. Alphabetical List of Hazardous Waste Sites with Location in Document and Cited ATSDR Health Assessments and Consultations and EPA Fact Sheets and RODs	311

LIST OF ACRONYMS

B(a)P	Benzo(a)pyrene
BTEX	benzene, toluene, ethylbenzene, xylenes
CDC	Centers for Disease Control and Prevention
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
DDT	dichlorodiphenyltrichloroethane
DOH	Department of Health
EPA	Environmental Protection Agency
FDA	Food and Drug Administration
GIS	Geographical Information Systems
HazDat	ATSDR's Hazardous Substance Release and Health Effects Database
HRSA	Health Resources & Services Administration
IJC	International Joint Commission
MCL	maximum contaminant level
MRLs	Minimal Risk Levels
NPL	National Priorities List
NPDES	National Pollution Discharge Elimination System
NRDA	Natural Resources Damage Assessment
PAHs	polycyclicaromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCDDs	polychlorinated dibenzo-p-dioxins
PCDFs	polychlorinated dibenzofurans
PBBs	polybrominated biphenyls
ppm	parts per million
ppt	parts per trillion
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
SARA	Superfund Amendments & Reauthorization Act
SVOCs	semivolatile organic compounds
TCDD	tetrachlorodibenzo-p-dioxin
TEQs	toxicity equivalent
TRI	Toxics Release Inventory
VOCs	volatile organic compounds