Chapter 6. Lake Superior

Chapter 6. Lake Superior

6.1. Deer Lake AOC, Marquette County, MI

Deer Lake AOC is in Marquette County, MI. The Deer Lake AOC includes the Carp River watershed: Deer Lake, Carp Creek, and the Carp River downstream about 20 miles to Lake Superior in Marquette (see AOC map at end of chapter and in Appendix 2). In the 1880s, Deer Lake was polluted with mercury from the processing of gold ore and assaying tests conducted on ore samples from another facility. This led to high levels of mercury bioaccumulation in fish.

6.1.1. Hazardous Waste Sites Relevant to the Deer Lake AOC

ATSDR has evaluated the data for hazardous waste sites in Marquette County, MI, and reached conclusions regarding any public health threat posed by sites. Conclusions are summarized in Table 6.1-A for the one site categorized as an indeterminate public health hazard at some point during its assessment history, together with information regarding the type and location of the site and the date and type of assessment document.

Table 6.1-A. Hazardous Waste Sites in Marquette County, MI

Site Name, City, and CERCLIS ID	*ATSDR Document Type*	*Document Year*	*ATSDR Hazard Category*	*Site Type*	*Remedial Status*
Cliff/Dow Dump, Marquette MID980608970	HA	1988	3	Deleted From NPL	Completed

3 = Indeterminate Public Health Hazard, HA = Public Health Assessment

ATSDR conducted further evaluation of the data for this site in the public health assessment document listed in the table. This evaluation is discussed in the following section.

6.1.1.1 Cliff/Dow Dump

The 2-acre Cliff/Dow Dump in the City of Marquette (Marquette County) MI, received wastes from the Cliffs-Dow Chemical Company, which manufactured charcoal at a facility 2 miles from the site.

Demographic Data: The 2000 U.S. Census reported the following demographic profile for vulnerable populations living within 1 mile of this site:

Children 6 years and younger	137
Females aged 15-44	808
Adults 65 and older	157

ATSDR Conclusions: In 1988, ATSDR concluded that although inadequate site characterization prevented a determination regarding whether offsite exposure to contaminants had occurred, the presence of contaminants at levels of health concern meant the site nonetheless posed an *Indeterminate Public Health Hazard* (Category 3).

Since the time of ATSDR's assessment, the site has been remediated by the removal of waste and fill and the replacement of contaminated fill with clean fill.

U.S. EPA Update: In its September 2006 Fact Sheet for the Cliff/Dow Dump. U.S. EPA stated in part that

> Past studies indicated that natural attenuation is occurring and will effectively remediate the groundwater. In early December 1997, another sampling event was conducted at the site to demonstrate that the remaining groundwater contamination does not pose an unacceptable risk to human health or the environment. The results of this sampling round supported this. The site was deleted from the National Priorities List on October 18, 2000. Deed restrictions on the use of the site and groundwater have been removed.
>
> No five-year review is required, since all contamination was removed from the site.

Available at: http://www.epa.gov/region5superfund/npl/michigan/MID980608970.htm. 2006 Sep [cited 2008 Jul 14].

IJC-critical Pollutants Identified within ATSDR Documents: During ATSDR's assessment of exposure-related issues, the IJC-critical pollutants dibenzofurans and PAHs (including acenaphthalene, phenanthrene, and fluorene) were identified. For a more complete listing of the hazardous substances found at this site, please refer to www.epa.gov/superfund/sites/npl/npl.htm.

6.1.2. Summary and Conclusions for the Deer Lake AOC

6.1.2.1 Hazardous Waste Sites

The one hazardous waste site categorized by ATSDR as either an urgent public health hazard, a public health hazard, or an indeterminate public health hazard was contaminated with the IJC-critical pollutants dibenzofurans and PAHs. The site has since been completely remediated. In June, 2006, U.S. EPA reported that contamination of fish with mercury and problems with sewage were of concern at this site.

6.1.2.2 TRI Data

The TRI onsite chemical releases for Marquette County, MI in 2001 totaled 1,000,114 pounds, the majority of which were released to air, followed by releases to land. See Table 6.1-B. IJC-critical pollutants accounted for 3,214 pounds (0.3 %) of the total onsite releases. The IJC-critical pollutants released were PCDDs and PCDFs (to air), lead, and lead compounds (primarily to land) and mercury compounds (primarily to air and land). The largest release (400,000 pounds) of non-IJC chemicals was of hydrochloric acid aerosols to air. The next largest releases (150,000–299,999 pounds) were of barium compounds (primarily to land), and hydrogen fluoride (to air). See Table 6.1-C.

6.1.2.3 NPDES Data

The NPDES permitted discharges for Marquette County, MI are summarized in Table 6.1-D. The average annual permitted discharges in 2004 totaled 360,104 pounds, the majority of which was ammonia nitrogen.

The IJC-critical pollutant mercury (0.66 pounds) was permitted to be discharged. The facilities permitted to release this pollutant are listed in Table 6.1-E.

6.1.2.4 County Demographic Data

Vulnerable populations in Marquette County, MI totaled 27,610.

6.1.2.5 Beneficial Use Impairments (BUIs)

A fish consumption restriction in the Deer Lake AOC has been established because of mercury concentrations exceeding the 1.5mg/kg Do-Not-Eat threshold established by the Michigan Department of Community Health. Currently, all fish from Deer Lake are under a possession ban. Brook trout from Carp Creek and the Carp River may be consumed, but consumption of other species from these sources is not advised. Wildlife in the Deer Lake AOC are under no consumption advisories. Further information is available at the U.S. EPA Web site (http://www.epa.gov/glnpo/aoc/).

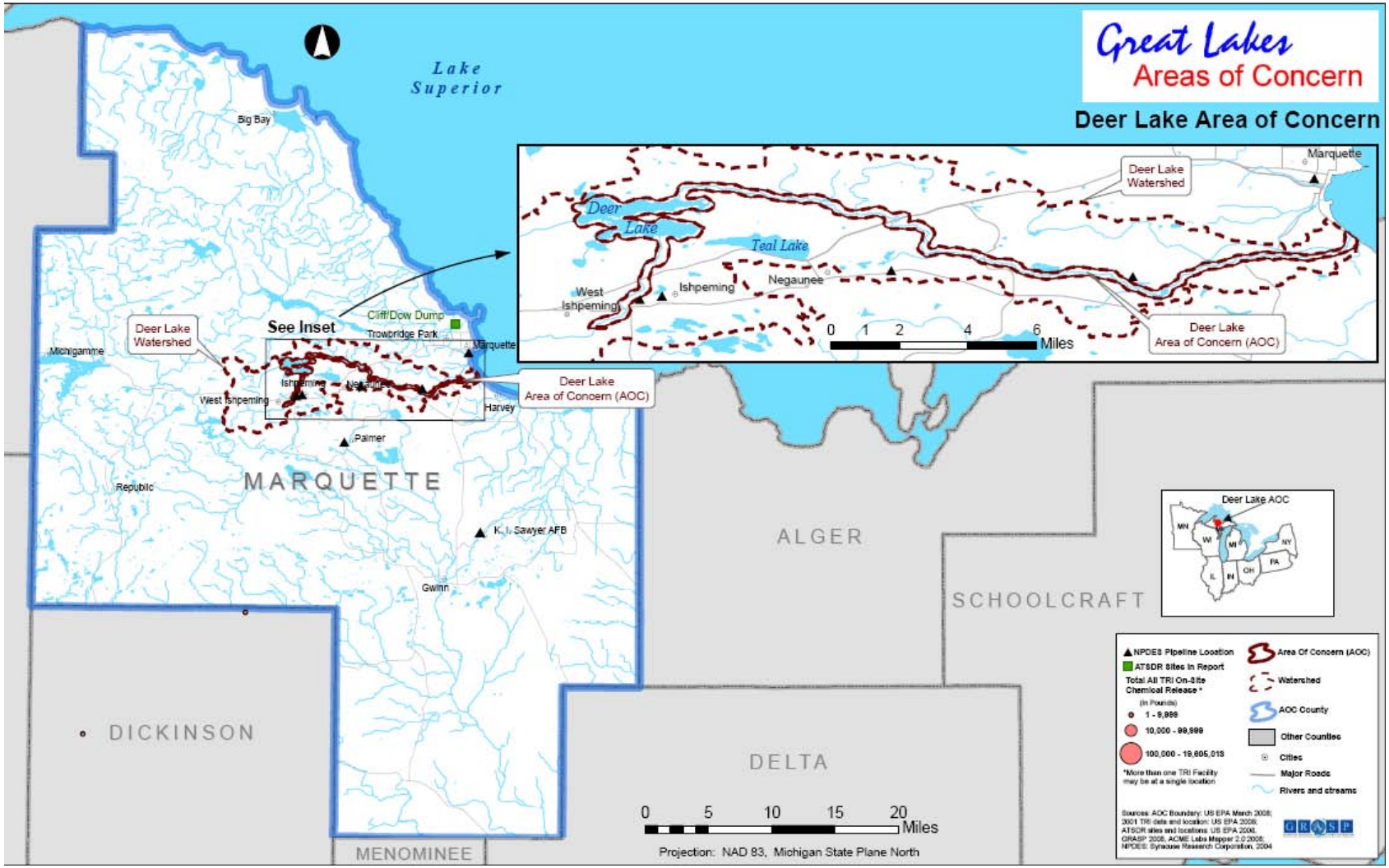
Great Lakes
Areas of Concern
Deer Lake Area of Concern
Lake Superior
Big Bay
Deer Lake Watershed
See Inset
Cliff/Dow Dump
Trowbridge Park
Marquette
Michigamme
Ishpeming
Negaunee
West Ishpeming
Harvey
Deer Lake Area of Concern (AOC)
Palmer
Republic
MARQUETTE
K. I. Sawyer AFB
Gwinn
ALGER
SCHOOLCRAFT
DICKINSON
DELTA
MENOMINEE
Deer Lake
Teal Lake
West Ishpeming
Ishpeming
Negaunee
Marquette
Deer Lake Watershed
Deer Lake Area of Concern (AOC)
0 1 2 4 6 Miles
0 5 10 15 20 Miles
Projection: NAD 83, Michigan State Plane North
Deer Lake AOC
MN
WI
MI
NY
PA
OH
IN
IL
NPDES Pipeline Location
ATSDR Sites in Report
Total All TRI On-Site Chemical Release *
(In Pounds)
1 - 9,999
10,000 - 99,999
100,000 - 19,805,013
*More than one TRI Facility may be at a single location
Area Of Concern (AOC)
Watershed
AOC County
Other Counties
Cities
Major Roads
Rivers and streams
Sources: AOC Boundary: US EPA March 2008;
2001 TRI data and location: US EPA 2008;
ATSDR sites and locations: US EPA 2008;
GRASP 2008, ACME Labs Mapper 2.0 2008;
NPDES: Syracuse Research Corporation, 2004
GLASP

Table 6.1-B. TRI Releases (in pounds, 2001) for the Deer Lake AOC

Chemical	IJC Tracking Number	Total Air Emissions	Surface Water Discharges	Under-ground Injection	Releases to Land	Total Onsite Releases	Total Offsite Releases	Total On- and Offsite Releases
DIOXIN AND DIOXIN-LIKE COMPOUNDS	2	0.00200214	No data	0	0	0.00200214	0	0.00200214
(PCDDs and PCDFs)	3							
LEAD	8	5.6	No data	0	0	5.6	0	5.6
LEAD COMPOUNDS	8	36.6	0	0	3012	3048.6	1084.3	4132.9
MERCURY COMPOUNDS	9	115.98	0.006	0	44.1	160.086	16.8	176.886
	Total IJC	158.1820021	0.006	0	3056.1	3214.288002	1101.1	4315.388002
BARIUM		0	No data	0	0	0	117000	117000
BARIUM COMPOUNDS		3000	30	0	260000	263030	0	263030
BENZO(G,H,I)PERYLENE		0	11	0	1.3	12.3	0	12.3
HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)		400000	No data	0	0	400000	0	400000
HYDROGEN FLUORIDE		190000	No data	0	0	190000	0	190000
MANGANESE COMPOUNDS		223	720	0	19000	19943	0	19943
NICKEL COMPOUNDS		130	0	0	8500	8630	0	8630
NITRATE COMPOUNDS		1000	No data	0	0	1000	0	1000
POLYCYCLIC AROMATIC COMPOUNDS		1.48	No data	0	7.546	9.026	0	9.026
SULFURIC ACID (1994 AND AFTER 'ACID AEROSOLS' ONLY)		62000	No data	0	0	62000	0	62000
VANADIUM COMPOUNDS		460	No data	0	44000	44460	0	44460
ZINC COMPOUNDS		86	230	0	7500	7816	118	7934

Chemical	IJC Tracking Number	Total Air Emissions	Surface Water Discharges	Under-ground Injection	Releases to Land	Total Onsite Releases	Total Offsite Releases	Total On- and Offsite Releases
	Total Non-IJC	656900.48	991	0	339008.846	996900.326	117118	1114018.326
	Total	657058.662	991.006	0	342064.946	1000114.614	118219.1	1118333.714

Table 6.1-C. TRI Facilities Releasing IJC-critical Pollutants Onsite for the Deer Lake AOC

IJC-critical Pollutant	*Number of Facilities*	*Facility Name*	*TRIF ID*	*City*
Dioxin and dioxin-like compounds *(PCDDs and PCDFs)*	1			
Marquette County, MI	1	PRESQUE ISLE POWER PLANT	49855PRSQS2701L	MARQUETTE
Lead and lead compounds	2			
Marquette County, MI	2	L-P GWINN STUDMILL	49841LPGWN650AA	GWINN
		PRESQUE ISLE POWER PLANT	49855PRSQS2701L	MARQUETTE
Mercury and mercury compounds	2			
Marquette County, MI	2	MARQUETTE BD OF LIGHT & POWER	49855MRQTTEHAMP	MARQUETTE
		PRESQUE ISLE POWER PLANT	49855PRSQS2701L	MARQUETTE

Table 6.1-D. NPDES Permitted Average Annual Discharges (in pounds, 2004) to Surface Water, Deer Lake AOC

Chemical	*IJC Tracking Number*	*Discharge*
MERCURY, TOTAL (AS HG)	9	0.66
	Total IJC	0.66
BERYLLIUM, TOTAL (AS BE)		12.78
NITROGEN, AMMONIA TOTAL (AS N)		332971.25
PHOSPHORUS, TOTAL (AS P)		26937
SELENIUM, TOTAL (AS SE)		73
VANADIUM, TOTAL (AS V)		109.50
	Total Non-IJC	360103.53
	Total	360104.19

Table 6.1-E. NPDES Facilities Permitted to Discharge IJC-critical Pollutants, Deer Lake AOC

IJC-critical Pollutant	*Number of Facilities*	*Facility Name*	*NPDES*	*City*
Mercury	2			
Marquette County, MI	2	MARQUETTE WWTP	MI0023531	MARQUETTE
		NEGAUNEE WWTP	MI0021296	NEGAUNEE

6.2. Torch Lake AOC, Houghton County, MI

Situated on Michigan's Keweenaw Peninsula, the Torch Lake AOC includes the Keweenaw Waterway (North Entry Harbor of Refuge, Portage Lake, and Torch Lake), its watershed, portions of two other watersheds (Trout River and the Eagle River Complex), and several miles of western Lake Superior shoreline. These areas share one contaminant problem: copper mining waste materials. The largest and only waste site within the AOC is the western shore of Torch Lake (see AOC map at end of chapter and in Appendix 2). Information regarding this site is from ATSDR's 1989 public health assessment, 1998 health consultation, and U.S. EPA's June 2008 NPL site Fact Sheet.

6.2.1. Hazardous Waste Sites Relevant to the Torch Lake AOC

ATSDR has evaluated the data for hazardous waste sites in Houghton County, MI, and reached conclusions regarding the public health threat posed by these sites. Table 6.2-A summarizes these conclusions for the one site categorized as either an urgent public health hazard, a public health hazard, or an indeterminate public health hazard at some time during its assessment history, together with information regarding the type and location of the site, and the date and type of assessment document.

Table 6.2-A. Hazardous Waste Sites in Houghton County, MI

Site Name, City, and CERCLIS ID	*ATSDR Document Type*	*Document Year*	*ATSDR Hazard Category*	*Site Type*	*Remedial Status*
Torch Lake, Houghton County	HA	1989	3	NPL	Ongoing
MID980901946	HC	1998	2		

3 = Indeterminate Public Health Hazard, 2= Public Health Hazard, HA = Public Health Assessment

HC= Health Consultation.

ATSDR conducted further evaluation of the data for this site in the document listed in the table, which evaluation is discussed in the following section.

6.2.1.1 Torch Lake

Torch Lake is a 2,700-acre lake in the Keweenaw Waterway. From the 1890s until 1969, the lake was heavily polluted by copper mining activities. Mill tailings (stamp sands) were dumped into the lake and along the shoreline. The tailings were dredged up and processed with flotation chemicals (creosotes and xanthates) to reclaim the copper. The wastes were then returned to the lake and to the shoreline. A high incidence of tumors were found in Torch Lake fish.

The Torch Lake site comprises three Operable Units (OU). OU1 includes stamp sands and tailings, slag, and drums along the western short of Torch Lake. OU2 includes groundwater, surface water and sediments associated with the site, and OU3 includes several other areas on the Keweenaw Peninsula contaminated with stamp sands. Information regarding this site is taken from the 1989 ATSDR public health assessment, the 1998 ATSDR health consultation, and the 2008 U.S. EPA NPL site Fact Sheet.

Demographic Data: The 2000 U.S. Census reported the following demographic profile for vulnerable populations living within 1 mile of this site:

Children 6 years and younger	259
Females aged 15-44	516
Adults 65 and older	559

Public Health Outcome Data: The 1989 health assessment concluded the incidence of cancer deaths from 1970 to 1981 indicated that all but stomach cancer were at or below the state average for age-adjusted cancer mortality. ATSDR suggested that stomach cancer in this locale may be higher because of the population's predominantly Scandinavian origin; Scandinavians have a high intake of salt and salted foods. Consumption of high levels of salt and salted foods is a risk factor for stomach cancer. The health assessment did not provide further details, however.

ATSDR Conclusions: In 1989, ATSDR categorized this site as an *Indeterminate Public Health Hazard* (Category 3). In 1998 ATSDR concluded that given the possibility of long-term exposure from incidental ingestion (arsenic) or pica behavior (lead) on the properties considered for residential development, levels of arsenic and the IJC-critical pollutant lead in the soil of some of the brownfields properties posed a *Public Health Hazard* (Category 2). In 2006, U.S. EPA reported, however, that since 1993, the Michigan Department of Natural Resources had not received any reports of fish tumors.

Remediation of the area included removal of drums buried in piles of tailings on the shore and in the lake, as well as the contaminated soil beneath the drums. A removal action is also underway to address asbestos at the Quincy Smelter. About 800 acres of tailings and slag piles are being covered with soil and vegetation. This process was to be completed in 2004. Long-term monitoring of Torch Lake is in place and further abatement measures are under consideration.

U.S. EPA Update: In its June 2008 Fact Sheet for the Torch Lake site, U.S. EPA stated in part that

> In 2007, U.S. EPA's Removal Program completed the Torch Lake Area Assessment, which consisted of a wide-ranging sampling effort of mining impacts in the Keweenaw Peninsula. A report summarizing the sampling effort was finalized in 2007, and the conclusions of the report are being considered by U.S. EPA and MDEQ. The Removal Program identified an area in Lake Linden with elevated levels of arsenic and lead in soils. In August 2007, approximately 1,010 cubic yards of contaminated soils were excavated from this area by Removal contractors. In 2008, U.S. EPA's Removal Program also began asbestos abatement activities at Quincy Smelter.
>
> A second five year review was completed in March 2008. This Five Year Review identified several issues that U.S. EPA and MDEQ plan to address, including implementation of institutional controls at certain properties, investigation of residential wells in the site area, further assessment of the Lake Linden and Mason Sands area, and completion of removal actions at Quincy Smelter.

Available at: http://www.epa.gov/region5superfund/npl/michigan/MID980901946.htm. 2008 Jun [cited 2008 14 Jul].

IJC-critical Pollutants Identified within ATSDR Documents: During ATSDR's assessment of exposure-related issues, the IJC-critical pollutants PAHs and lead were identified at this site. For a more complete listing of the hazardous substances found at this site please refer to www.epa.gov/superfund/sites/npl/npl.htm.

6.2.2. Summary and Conclusions for the Torch Lake AOC

6.2.2.1 Hazardous Waste Sites

The Torch Lake site was the only site in this AOC that ATSDR categorized as either an urgent public health hazard, a public health hazard, or an indeterminate public health hazard. The more recent assessment for this site focused on brownfields properties near the lake and concluded that if some of the properties were to be developed residentially, arsenic and possibly the IJC-critical pollutant lead were present at levels of concern. In June, 2004, however, U.S. EPA reported that many of the brownfields sites were remediated and no longer posed a threat.

In the past, Torch Lake was directly affected by tailings in the water and around the shoreline. Although the initial ATSDR health assessment noted the past, high incidence of fish tumors from an unknown etiologic agent, fish tumor incidence has since returned to normal.

Remediation has occurred, and monitoring has indicated that most contamination levels were within safety standards. In 2004, U.S. EPA reported the elimination of exposure risk to residents from onsite contaminants (e.g., pica ingestion behavior in children). U.S. EPA further reported (2006) that since 1999, when Superfund clean up began, almost 800 acres of the Torch Lake Superfund site have been remediated. Only a portion of those 800 acres (approximately 480 acres), however, is within the Torch Lake AOC boundaries.

6.2.2.2 TRI Data

The TRI onsite chemical releases for Houghton County, MI in 2001 totaled 487,148 pounds, all of which were released to air. See Table 6.2-B.

IJC-critical pollutants accounted for 0.332 pounds of the total onsite releases. The IJC-critical pollutants released were lead and lead compounds (to air).

The largest release (408,000 pounds) of non-IJC chemicals was of ammonia (to air). No other chemicals were released in quantities as large as 150,000. See Table 6.2-C.

6.2.2.3 NPDES Data

The NPDES permitted discharges for Houghton County, MI are summarized in Table 6.2-D. The average annual permitted discharges in 2004 totaled 9,490 pounds, all of which was phosphorus. No IJC-critical pollutants were the subject of permitted (quantity average limit) discharge amounts.

6.2.2.4 Beneficial Use Impairments (BUIs)

The U.S. EPA Web site states that a restriction on fish and wildlife consumption was documented in the 1987 Remedial Action Plan but was not updated. The advisory was limited to

sauger and walleye in Torch Lake and announced April 1983. That advisory has since been discontinued *per* Michigan Department of Community Health, 2008 Jun 25.

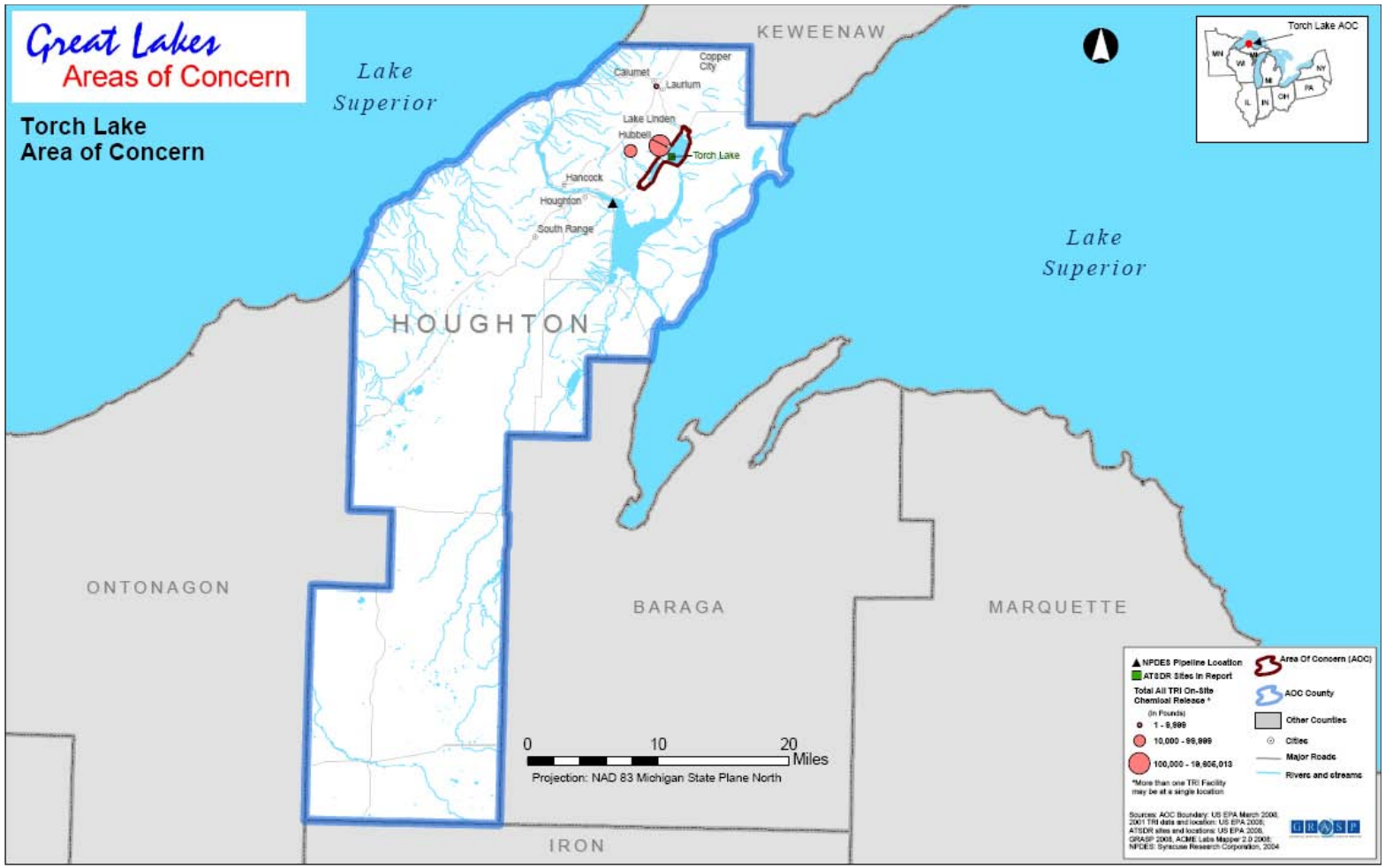
Great Lakes
Areas of Concern
Torch Lake
Area of Concern
Lake
Superior
KEWEENAW
Copper City
Calumet
Laurium
Lake Linden
Hubbell
Torch Lake
Hancock
Houghton
South Range
HOUGHTON
Lake
Superior
ONTONAGON
BARAGA
MARQUETTE
IRON
0
10
20
Miles
Projection: NAD 83 Michigan State Plane North
Torch Lake AOC
MN
WI
MI
NY
IL
IN
OH
PA
NPDES Pipeline Location
ATSDR Sites in Report
Total All TRI On-Site Chemical Release *
(in Pounds)
1 - 9,999
10,000 - 99,999
100,000 - 19,806,013
*More than one TRI Facility may be at a single location
Area Of Concern (AOC)
AOC County
Other Counties
Cities
Major Roads
Rivers and streams
Sources: AOC Boundary: US EPA March 2008.
2001 TRI data and location: US EPA 2008.
ATSDR sites and locations: US EPA 2008.
GRASP 2008, ACME Labs Mapper 2.0 2008.
NPDES: Syracuse Research Corporation, 2004
GLSLP

Table 6.2-B. TRI Releases (in pounds, 2001) for the Torch Lake AOC

Chemical	*IJC Tracking Number*	*Total Air Emissions*	*Surface Water Discharges*	*Under-ground Injection*	*Releases to Land*	*Total Onsite Releases*	*Total Offsite Releases*	*Total On- and Offsite Releases*
LEAD	8	0.3	No data	0	0	0.3	0	0.3
LEAD COMPOUNDS	8	0.032	No data	0	0	0.032	5.52	5.552
	Total IJC	0.332	No data	0	0	0.332	5.52	5.852
AMMONIA		408109	No data	0	0	408109	0	408109
COPPER COMPOUNDS		500	No data	0	0	500	59011	59511
METHYL METHACRYLATE		1398	No data	0	0	1398	0	1398
STYRENE		77141	No data	0	0	77141	0	77141
	Total Non-IJC	487148	No data	0	0	487148	59011	546159
	Total	487148.332	No data	0	0	487148.332	59016.52	546164.852

Table 6.2-C. TRI Facilities Releasing IJC-critical Pollutants Onsite for the Torch Lake AOC

IJC-critical Pollutant	*Number of Facilities*	*Facility Name*	*TRIF ID*	*City*
Lead and lead compounds	2			
Houghton County, MI	2	CALUMET ELECTRONICS CORP.	49913CLMTL25830	CALUMET

Table 6.2-D. NPDES Permitted Average Annual Discharges (in pounds, 2004) to Surface Water, Torch Lake AOC

Chemical	*Facility*	*IJC Tracking Number*	*Discharge*		*City*
PHOSPHORUS, TOTAL (AS P)	PENINSULA COPPER INDS. INC. ,	49934PNNSL1700D	0		HUBBELL
			Total IJC9	490	
			Total Non-IJC	9490	
			Total	9490	

6.3. St. Louis River and Bay AOC, St. Louis and Carlton Counties, MN and Douglas County, WI.

The 39 miles of the St. Louis River below Cloquet, MN, constitute the St. Louis River and Bay AOC[4] (see AOC map at end of chapter and in Appendix 2).

6.3.1. Hazardous Waste Sites Relevant to the St. Louis River and Bay AOC

ATSDR evaluated data for hazardous waste sites in the counties relevant to this AOC, and reached conclusions regarding any public health threat those sites might pose. Conclusions are summarized in Table 6.3-A for sites categorized as either an urgent public health hazard, a public health hazard, or an indeterminate public health hazard at some point during their assessment history, together with information regarding the type and location of the site and the date and type of assessment document. ATSDR did not assess any waste sites in Carlton County, MN.

Table 6.3-A. Hazardous Waste Sites in St. Louis and Carlton Counties, MN, and Douglas County, WI

Site Name, City, and CERCLIS ID	*ATSDR Document Type*	*Document Year*	*ATSDR Hazard Category*	*Site Type*	*Remedial Status*
American Linen, Hibbing, St. Louis MND022817308	HA	2001	3	Non NPL	Ongoing
Arrowhead Refinery Co., St. Louis, Hermantown MND980823975	HA HA	1986 1993	3 2	NPL	Ongoing
Koppers Co. Superior Plant, Douglas, Superior WID006179493	HC HC	2001 2003	2 3	Non NPL	To be Determined
St. Louis River site, St. Louis, St. Louis County[5] MND039045430	HA HC	1989 2001	3 2	NPL	Ongoing

2 =Public Health Hazard, 3 =Indeterminate Public Health Hazard,

HA = Public Health Assessment, HC =Health Consultation, SRU=Site Review and Update

6.3.1.1 American Linen

This Hibbing (St. Louis County) MN, site currently occupies a full city block, bordered on the north by railroad tracks, to the east by 6th Avenue East, to the south by 19th Street, and to the west by 5th Avenue East. Commercial and industrial buildings are to the east and north (e.g., the

[4] The St. Louis River site comprises two sites: the Interlake/Duluth Tar Site and the U.S. Steel site

Hibbing Public Utilities steam plant and warehouses). Private residences are to the south, across 19th Street.

AmeriPride began commercial laundry operations at the site in the early 1920s in the building on the southeastern corner of the block. In 1987, three underground storage tanks (USTs) were removed from the site: two containing fuel oil and one containing gasoline.

In 1994, geotechnical drilling on the northeast portion of the site uncovered petroleum-contaminated soil. Approximately 1,400 cubic yards of soil previously removed from the site for geotechnical reasons was also suspected of petroleum-product contamination.

Investigation results showed that low levels of petroleum products remained in soil in the site's central portion. Groundwater sample analysis also revealed detectable levels of petroleum products. And volatile organic compounds (VOCs), primarily tetrachloroethylene (also known as perchloroethylene, or PCE), were also detected in soil and in groundwater at levels in excess of the MDH Health Risk Limit (HRL).

Demographic Data: The City of Hibbing is in St. Louis County and has a population of 17,720, in an estimated 7,478 households (1998 estimates; MOP 2000). The American Linen site is in a mixed use area, with commercial and industrial buildings to the east, north, and west, and residences to the south.

U.S. EPA Update: This American Linen site is a state-lead investigation site and does not appear in CERCLIS.

Minnesota Department of Health Update: Levels of VOCs in soil significantly exceed the MPCA's soil evaluation criteria for direct human contact. The contaminated soil is, however, beneath the site building, where the likelihood of human contact is minimal. The shallow groundwater beneath the site is contaminated with PCE and its breakdown products are at levels significantly in excess of the HRLs. At some locations, levels of vinyl chloride, a known human carcinogen, are over 100 times its HRL. Since monitoring began in the late 1990s, concentrations of VOCs in the shallow groundwater beneath and near the AmeriPride building have not changed significantly and show no clear upward or downward trend. Petroleum related site analyses continue to detect VOCs, although analyses for GRO and DRO have not been conducted since 1997. In the summer of 2008, however, a pilot test was conducted for an active soil venting remediation system beneath the AmeriPride building. Active remediation of the PCE contamination beneath the building is planned for the fall of 2008 (Mark Elliot, MPCA, Duluth, MN, personal communication, August 6, 2008).

Indoor air samples collected using SUMMA canisters in the basements of the AmeriPride building and Hibbing Public Utilities plant also show detectable levels of VOCs. Actual exposure to these levels of VOCs for an entire work day is likely not occurring, given the reported and observed use of the basements. The source of some of the VOCs may be other processes or products in use at the two facilities. Routine indoor air monitoring conducted on the upper floors of these buildings over the past several years has shown similar, but more variable, concentrations of PCE and other VOCs. The potential migration of gaseous VOCs along utility lines or through soil into other neighboring businesses or residences is currently under evaluation by sampling permanent soil vapor probes installed along the south side of 19th Street. The homes are 100 feet from the VOC plume's estimated boundary—but results are not yet available. For

that reason the site continues as an *Indeterminate Public Health Hazard* (Category 3). (Mark Elliot, MPCA, Duluth, MN, personal communication, 2008 Aug 6).

IJC-critical Pollutants Identified within ATSDR Documents: During ATSDR's assessment of exposure-related issues, no IJC-critical pollutants were identified at this site.

6.3.1.2 Arrowhead Refinery Company

The 10-acre Arrowhead Refinery site is about 8 miles northwest of Duluth in Hermantown (St. Louis County) MN. Before 1945, the facility retinned milk cans. From 1945 to 1977, Arrowhead Refinery recycled waste oil. In 1977, Arrowhead was ordered to stop onsite dumping of waste sludge from the oil refining process. Information regarding this site was taken from the 1986 and 1993 ATSDR public health assessments and the 2007 U.S. EPA NPL site Fact Sheet.

Demographic Data: The 2000 U.S. Census reported the following demographic profile for vulnerable populations living within 1 mile of this site:

Children 6 years and younger	33
Females aged 15-44	82
Adults 65 and older	56

ATSDR Conclusions: Because of potential exposures to lead-contaminated soil and waste sludge, in 1986 ATSDR categorized this site as an *Indeterminate Public Health Hazard* (Category 3). In 1993, ATSDR again assessed site-related exposures and concluded that without remediation, the potential for health effects from future exposures rendered the site a *Public Health Hazard* (Category 2). ATSDR further concluded that processes resulting from onsite contamination provided a mechanism for the mobilization and transport of manganese by onsite groundwater. In the past, residents with downgradient private wells might have been exposed to manganese at levels of health concern, but municipal water was supplied to nearby residents downgradient of the site.

U.S. EPA Update: In its December 2007 Fact Sheet for the Arrowhead Refinery company site, U.S. EPA stated in part that

> A third five-year review completed in September 2007 determined that all of the issues from the second five-year review were addressed with the exception of the finalization of the property restrictive covenants. Restrictive covenants are one of several legal or administrative controls which help to minimize exposure to contaminants and are generally referred to as institutional controls. The third five-year review determined that the remedy is expected to be or is protective of human health and the environment, and in the interim, exposure pathways that could result in unacceptable risks are being controlled. However, in order for the remedy to be protective in the long-term, the following actions need to be taken. A trial shut-down of the groundwater extraction system has been started and ground water monitoring will be performed for several more years to verify that groundwater clean up goals have been achieved. Groundwater will also be monitored to determine if surface water is being impacted by the site. An evaluation will also be performed to assure that institutional

controls have been implemented and that the institutional controls ensure long-term stewardship of the site.

Available at: http://www.epa.gov/region5superfund/npl/minnesota/MND980823975.htm. 2007 Dec [cited 2008 Jul 14].

IJC-critical Pollutants Identified within ATSDR Documents: During ATSDR's assessment of exposure-related issues, the IJC-critical pollutant lead, mercury, DDT, DDD, B[a]A, B[a]P, and chrysene were identified at this site. For a more complete listing of the hazardous substances found at this site, please refer to www.epa.gov/superfund/sites/npl/npl.htm.

6.3.1.3 Koppers Company Superior Plant

The Koppers facility in the Town of Superior, (Douglas County) WI, contaminated the Crawford Creek basin soils and sediments with wood-treatment chemicals. Information regarding this site is from ATSDR's 2001 and 2003 health consultations.

ATSDR Conclusions: In 2001, ATSDR concluded that creosote wastes and PAHs in the soils and sediments of lower Crawford Creek posed a *Public Health Hazard* (Category 2). In 2003, ATSDR categorized the site as an *Indeterminate Public Health Hazard* (Category 3) for PCDD and PCDF contamination of fish. The Koppers facility contaminated the Crawford Creek basin with PAHs at levels of public health concern.

U.S. EPA Update: The Koppers Company Superior Plant site is a non-NPL site.

Wisconsin Department of Health and Family Services Update: Impacted flood plain soils along portions of Crawford Creek remain a public health hazard, but warning signs are annually inspected and maintained (Field & Technical Services, September 10, 2007, Summary of 2007 Sign Inspection Activities, Carnegie, PA). State and federal agencies and Beazer (Responsible Party) are discussing the details of the offsite human health risk assessment, which will be used to establish health-based cleanup goals and subsequent remedial actions. Fish surveyed and sampled during 2005 were limited to nonsport, forage fish in the creek. Subsequent laboratory tests found contaminant levels in these fish posed a no apparent human health hazard (BBL, Syracuse NY, Koppers Inc. Off-Property Investigation, 2006 Feb).

IJC-critical Pollutants Identified within ATSDR Documents: During ATSDR's assessment of exposure-related issues, the IJC-critical dioxins, furans, B[a]A, B[a]P, B[b]F, chrysene, DB[a,h]A, and I[123cd]P were identified at the site.

6.3.1.4 St. Louis River Site

St. Louis River comprises two sites: the 255-acre St. Louis River/Interlake/Duluth Tar site and the 640-acre U.S. Steel site, both within western Duluth on the St. Louis River. From about 1915 to 1979, U.S. Steel operated an integrated steel mill on the site. Soil, surface water, and groundwater are extensively contaminated with coke and tar products, which contain high concentrations of PAHs. From the late 1800s until about 1960, several companies used the Interlake Duluth Tar site for iron, steel, and tar manufacturing. This site was also extensively contaminated with PAHs. ATSDR's 1989 public health assessment, 2001 health consultation, and the U.S. EPA 2008 NPL site Fact Sheet supplied the information regarding both sites.

Demographic Data: The 2000 U.S. Census reported the following demographic profile for vulnerable populations living within 1 mile of this site:

Children 6 years and younger	417
Females aged 15-44	934
Adults 65 and older	756

ATSDR Conclusions: In 1989, because of the risk to human health from possible exposure to hazardous substances through dermal contact, ingestion, or inhalation of contaminated soil or sediments, ATSDR categorized this site as an *Indeterminate Public Health Hazard* (Category 3). In the 2001 health consultation, because of the possibility of exposure to contaminated sediments, ATSDR concluded the site was a *Public Health Hazard* (Category 2).

U.S. EPA Update: In its April 2008 Fact Sheet for the St Louis River/US Steel site, U.S. EPA stated in part with regard to the U. S. Steel site that

> ***U.S. Steel Site***
> The result of this five-year review indicated that the remedies are generally functioning as intended by the decision documents and are protective of human health and the environment in the short term. A protectiveness statement was developed for each OU and the two other response actions that were identified in the ROD with the exception of OU N and R. Protectiveness determinations were not developed for OU-N and R during this 5-year review because these areas are being evaluated as a component of an on-going sediment investigation.
>
> In order to assure the long-term protectiveness of the site, most of the remedial areas require follow-up activities. The ROD did not establish Target Clean-up Levels for soils. Therefore, the remedial actions that included removal of contaminated soil require an ecological and human health risk-based screening in order to assure long protectiveness. The operable units that had soil excavation as a component include OUs A, D, E, H and the Soil Contaminated by Above and Below Ground Petroleum Storage Tanks.
>
> With regard to the St Louis River Site, U.S. EPA stated in part that
>
> ***St. Louis River/Interlake/Duluth Tar Site***
> This Site is comprised of three Operable Units (OUs). The Tar Seep OU (TSOU), the Soil OU (SOU), and the Sediment OU (SedOU). Remedial actions have been completed at the TSOU and the SOU. A remedy has not yet been selected for the SedOU.
>
> The result of this five-year review indicated the TSOU remedy is protective of human health and the environment. The tar seeps identified in the TSOU ROD were location specific and have been removed. No further review of this remedy is recommended.
>
> The SOU remedy is protective of human health and the environment in the short term because soil above direct exposure cleanup levels for industrial land use and construction workers has been removed. However the

remedy currently is not protective in the long term. The evaluation of soil contaminant transport to ground water has not been determined and ground water monitoring over time has not been performed as specified in the SOU ROD/ESD. Ground water sampling results in support of the Sediment OU (SedOU) investigation indicate the presence of low-level contamination but there is insufficient data to establish trends. Also preventing a long-term protectiveness determination are incomplete or missing restrictive covenants, evidence of recreational trespassing, and the placement of fill in violation of the water well code. In order for the soil remedy to be protective in the long term, the institutional control issues and evaluation of contaminant migration from soil to ground water must be addressed.

A comprehensive site-wide protectiveness statement cannot be developed until the selection and implementation of the SedOU remedy.

U. S. Steel and SLRIDT Overall Protectiveness Statement
A comprehensive site-wide protectiveness statement cannot be made until the Sediment Operable Units for U. S. Steel and SLRIDT remedies have been selected and constructed. Another 5-year Review is currently underway and will be completed by September 2008.

Available at: http://www.epa.gov/region5superfund/npl/minnesota/MND039045430.htm. 2008 Apr [cited 2008 Jul 14].

IJC-critical Pollutants Identified within ATSDR Documents: During ATSDR's assessment of exposure-related issues, the IJC-critical pollutants B[a]A, B[a]P, I[1233cd]P, DB[ah]A, chrysene, furans, dioxin, mercury, and hexachlorobenzene were identified at this site. For a more complete listing of the hazardous substances found at this site, please refer to www.epa.gov/superfund/sites/npl/npl.htm.

6.3.2. Summary and Conclusions for the St. Louis River and Bay AOC

6.3.2.1 Hazardous Waste Sites

ATSDR categorized five hazardous waste sites relevant to this AOC as either an urgent public health hazard, a public health hazard, or an indeterminate public health hazard. As of the date of this report, four sites were under remediation, and the remediation status of the remaining site was as yet to be determined.

St. Louis River Site: This site (comprising two sites on the river) has not been completely remediated and appears to have contributed significantly to the river's contaminant burden, including B(a)P.

Koppers Co. Superior Plant: ATSDR was concerned that the levels of PCDDs and PCDFs in sediment of the nearby creek could bioaccumulate to levels of concern in fish. Although as of the 2003 ATSDR health consultation, none of the site-related contaminants in the creek soil and

sediments had been cleaned up, the State of Wisconsin reports that as of the date of this report remediation discussions are active and ongoing.

6.3.2.2 TRI Data

In 2001, the TRI onsite chemical releases for St. Louis and Carlton Counties, MN, and Douglas County, WI, in 2001 totaled 1,253,524 pounds, the majority of which were released to air, followed by releases to land. St. Louis County accounted for 37%, Carlton County accounted for 46%, and Douglas County accounted for 17% of the total onsite releases.

IJC-critical pollutants accounted for 4,417 pounds (0.4 %) of the total onsite releases. The IJC-critical pollutants released were PCDDs and PCDFs (to air and land), lead and lead compounds (to air and land), and mercury compounds (primarily to air).

The largest release (300,000–499,999 pounds) of non-IJC-critical chemicals was of methanol (to air). The next largest release category (150,000–299,999 pounds) also had one chemical, barium compounds (primarily to land). See Table 6.3-B. Facilities that released these pollutants are listed in Table 6.3-C.

6.3.2.3 NPDES Data

The NPDES permitted discharges for St. Louis and Carlton Counties, MN and Douglas County, WI are summarized in Table 6.3-D. The average annual permitted discharges in 2004 totaled 3,468 pounds, the majority of which was phosphorus. No IJC-critical pollutants were the subject of permitted (quantity average limit) discharge amounts.

6.3.2.4 Beneficial Use Impairments (BUIs)

Restrictions of fish consumption in Lake Superior and the St. Louis River have been issued by both Minnesota and Wisconsin based on mercury and polychlorinated biphenyl levels in fish tissue. Further information is available at the U.S. EPA Web site (http://www.epa.gov/glnpo/aoc/).

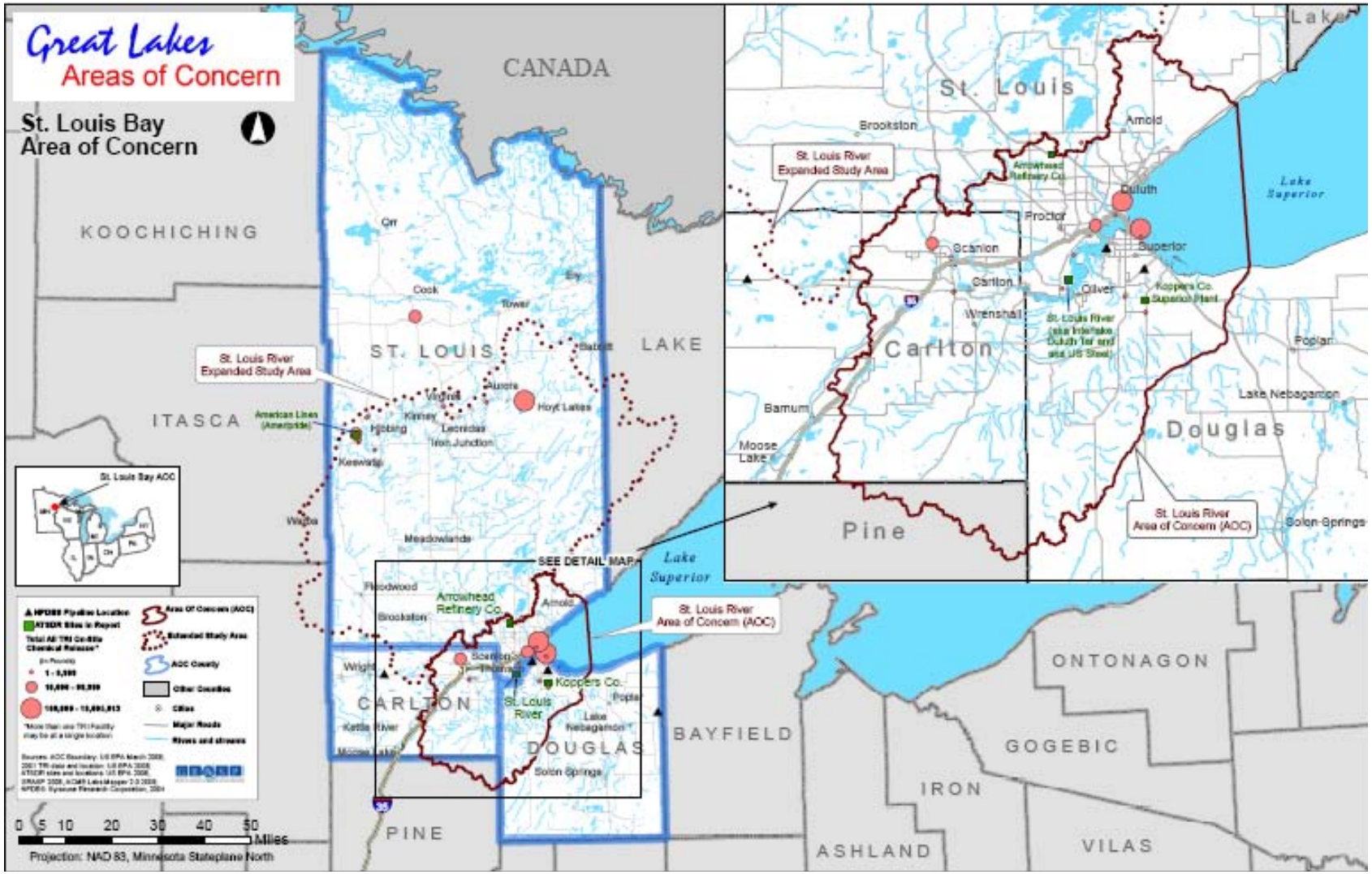
Great Lakes
Areas of Concern
St. Louis Bay
Area of Concern
CANADA
KOOCHICHING
ITASCA
ST. LOUIS
LAKE
CARLTON
DOUGLAS
PINE
BAYFIELD
ONTONAGON
GOGEBIC
IRON
ASHLAND
VILAS
St. Louis River
Expanded Study Area
St. Louis River
Area of Concern (AOC)
SEE DETAIL MAP
Arrowhead
Refinery Co.
Koppers Co.
St. Louis River
Lake Superior
Duluth
Superior
Proctor
Scanlon
Carlton
Oliver
Wrenshall
Barnum
Moose Lake
Lake Nebagamon
Poplar
Solon Springs
Brookston
Arnold
Cook
Orr
Tower
Aurora
Hoyt Lakes
Virginia
Kinney
Hibbing
American Lines
(Ameripride)
Leonidas
Iron Junction
Keewatin
Wagba
Meadowlands
Floodwood
Wright
Kettle River
Moose Lake
0 5 10 20 30 40 50
Miles
Projection: NAD 83, Minnesota Stateplane North

Table 6.3-B. TRI Releases (in pounds, 2001) for the St. Louis River and Bay AOC

Chemical	IJC Tracking Number	Total Air Emissions	Surface Water Discharges	Under-ground Injection	Releases to Land	Total Onsite Releases	Total Offsite Releases	Total On- and Offsite Releases
DIOXIN AND DIOXIN-LIKE COMPOUNDS	2	0.002014709	0	0	0.001554525	0.003569234	0	0.003569234
(PCDDs and PCDFs)	3							
LEAD	8	355.3	0	0	17	372.3	16.9	389.2
LEAD COMPOUNDS	8	224.21	0.1	0	3785	4009.31	3372.65	7381.96
MERCURY	9	1.59	0	0	0	1.59	0	1.59
MERCURY COMPOUNDS	9	28.6	0	0	5.1	33.7	9.6	43.3
	Total IJC	609.7020147	0.1	0	3807.101555	4416.903569	3399.15	7816.053569
CHROMIUM		0	0	0	0	0	12189	12189
NICKEL COMPOUNDS		0	0	0	0	0	696	696
BENZO(G,H,I)PERYLENE		0.03	0	0	0.65	0.68	0.4	1.08
COPPER		1	0	0	0	1	21	22
CATECHOL		0	0	0	5	5	0	5
HYDROGEN FLUORIDE		5	0	0	0	5	0	5
BARIUM		10	5	0	0	15	1850	1865
CHROMIUM COMPOUNDS (EXCEPT CHROMITE ORE MINED IN THE TRANSVAAL REGION)		10	5	0	0	15	4104	4119
MOLYBDENUM TRIOXIDE		10	5	0	0	15	100	115
NICKEL		10	5	0	0	15	150	165
MALEIC ANHYDRIDE		66	0	0	0	66	0	66

Chemical	IJC Tracking Number	Total Air Emissions	Surface Water Discharges	Under-ground Injection	Releases to Land	Total Onsite Releases	Total Offsite Releases	Total On- and Offsite Releases
ETHYLENE		68	0	0	0	68	0	68
1,2,4-TRIMETHYLBENZENE		140	0	0	0	140	0	140
POLYCYCLIC AROMATIC COMPOUNDS		90.2	0.1	0	52	142.3	29.7	172
PHENOL		250	0	0	0	250	0	250
CYCLOHEXANE		267	0	0	0	267	0	267
CHLORINE		500	0	0	0	500	0	500
NAPHTHALENE		500	0	0	0	500	0	500
PROPYLENE OXIDE		500	0	0	0	500	0	500
CRESOL (MIXED ISOMERS)		755	0	0	5	760	0	760
TRICHLOROETHYLENE		889	0	0	0	889	0	889
NITRATE COMPOUNDS		0	0	0	1072	1072	0	1072
CREOSOTE		1280	1	0	0	1281	320	1601
TOLUENE		1302	0	0	0	1302	0	1302
BENZENE		1303	0	0	0	1303	0	1303
PROPYLENE		2088	0	0	0	2088	0	2088
METHYL ETHYL KETONE		2346	0	0	5	2351	0	2351
N-HEXANE		2485	0	0	0	2485	0	2485
ACROLEIN		13700	0	0	0	13700	0	13700
CHLORINE DIOXIDE		17124	0	0	0	17124	0	17124
ETHYLBENZENE		26588	0	0	0	26588	0	26588

Chemical	IJC Tracking Number	Total Air Emissions	Surface Water Discharges	Under-ground Injection	Releases to Land	Total Onsite Releases	Total Offsite Releases	Total On- and Offsite Releases
ACETALDEHYDE		44146	0	0	5	44151	0	44151
HYDROCHLORIC ACID (1995 AND AFTER 'ACID AEROSOLS' ONLY)		47557	0	0	0	47557	0	47557
FORMALDEHYDE		49963	0	0	5	49968	0	49968
MANGANESE COMPOUNDS		1461	15	0	89526	91002	41375	132377
XYLENE (MIXED ISOMERS)		114886	0	0	0	114886	0	114886
AMMONIA		123042	0	0	259	123301	0	123301
BARIUM COMPOUNDS		9441	12000	0	243059	264500	24599	289099
METHANOL		440294	0	0	0	440294	2033	442327
	Total Non-IJC	903077.23	12036.1	0	333993.65	1249106.98	87467.1	1336574.08
	Total	903686.932	12036.2	0	337800.7516	1253523.884	90866.25	1344390.134

Table 6.3-C. TRI Facilities Releasing IJC-critical Pollutants Onsite for the St. Louis River and Bay AOC

IJC-critical Pollutant	*Number of Facilities*	*Facility Name*	*TRIF ID*	*City*
Dioxin and dioxin-like compounds *(PCDDs and PCDFs)*	1			
Carlton County, MN	1	Sappi Cloquet LLC (Formerly POTLATCH CORP.)	55720PTLTCNORTH	CLOQUET
Lead and lead compounds	11			
Carlton County, MN	1	POTLATCH CORP. MN P & P DIV.	55720PTLTCNORTH	CLOQUET
Douglas County, MN	2	CLM CORP.	54880CLMCRHILLA	SUPERIOR
		GEORGIA-PACIFIC CORP.	54880SPRRFNORTH	SUPERIOR
St. Louis County, MN	8	GEORGIA-PACIFIC CORP.	55816SPRWD14THA	DULUTH
		HIBBING PUBLIC UTILITIES COMMISSION	55749HBBNG1832S	HIBBING
		L & M RADIATOR INC.	55746LMRDT1414E	HIBBING
		LASKIN ENERGY CENTER	55705LSKNN5699C	HOYT LAKES
		ME GLOBAL INC.	55808MNTRN200EA	DULUTH
		NOBLE INDS. LTD.	55746HBBNG3430E	HIBBING
		NORTHERN CASTINGS CORP.	55746NRTHR555WE	HIBBING
		POTLATCH CORP.	55723PTLTCPOBOX	COOK
Mercury and mercury compounds	5			
Douglas County, MN	2	CLM CORP.	54880CLMCRHILLA	SUPERIOR
		MURPHY OIL USA INC.	54880MRPHY24THA	SUPERIOR
St. Louis County, MN	3	HIBBING PUBLIC UTILITIES COMMISSION	55749HBBNG1832S	HIBBING
		LASKIN ENERGY CENTER	55705LSKNN5699C	HOYT LAKES
		POTLATCH CORP.	55723PTLTCPOBOX	COOK

Table 6.3-D. NPDES Permitted Average Annual Discharges (in pounds, 2004) to Surface Water, St. Louis River and Bay AOC

Chemical	*IJC Tracking Number*	*Discharge*
	Total IJC	0
CHROMIUM, HEXAVALENT TOT RECOVERABLE		47.45
CHROMIUM, TRIVALENT (AS CR)		573.05
PHENOLS		489.10
PHOSPHORUS, TOTAL (AS P)		1770.62
SULFITE (AS S)		587.65
	Total Non-IJC	3467.87
	Total	3467.87