6. LAKE SUPERIOR

6.1 DEER LAKE AOC, MARQUETTE COUNTY, MI

The Deer Lake AOC includes the Carp River watershed, which is composed of Deer Lake, Carp Creek, and the Carp River downstream about 20 miles to Lake Superior in Marquette (see AOC map in the appendix). Deer Lake was polluted with mercury from industrial activities (processing of gold ore in the 1880s and assaying test conducted on ore samples from another facility), leading to very high levels of mercury in the 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 the public health threat posed by these sites. These conclusions, along with information regarding the type and location of the site, and the date and type of assessment document, are summarized in Table 6.1-A, for the site that had a public health hazard category of 1-3 at some time during its assessment history.

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

Site Name	Public Health Hazard Category	EPA NPL Status	Site ID	City
Cliff/Dow Dump	3 (1988 HA)	Deleted Post SARA	MID980608970	Marquette

3 = Indeterminate Public Health Hazard
HA = Public Health Assessment

For this hazardous waste sites the number of contaminant records in HazDat that exceeded health based-screening values was 30, as shown in Table 6.1-B. Most of the records were for the soil and water media groups. None of the contaminants were IJC Great Lakes critical pollutants.

Further evaluation of the data for this site was conducted by ATSDR in the public health assessment document listed in the table. This evaluation is discussed in the following subsection.

6.1.1.1 Cliff/Dow Dump

The 2-acre Cliff/Dow Dump, located 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. Information regarding this site is taken from the 1988 ATSDR public health assessment and the 2003 EPA NPL fact sheet for the site.

Category of Public Health Hazard: This site was categorized as an *Indeterminate Public Health Hazard* (Category 3) by ATSDR because the site had not been characterized adequately to determine if offsite exposure to contaminants had occurred, particularly to contaminants in groundwater, and because contaminants were present at levels of health concern.

Contaminants of Concern in Completed Exposure Pathways: None. Contaminants of concern in groundwater were VOCs, and naphthalenes and phenanthrene. No IJC critical pollutants were discussed. Since the time of ATSDR's assessment, the site has been remediated by removal of waste and fill, replacement with clean fill, and vegetating the fill. Natural attenuation of the groundwater contamination resulted in acceptable levels by 1997. The site was deleted from the NPL in 2000 and deed restrictions on the use of the site and groundwater have been removed.

Demographics: Demographic profile, from the 2000 U.S. Census, for vulnerable populations living within one mile of this site:

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

Public Health Outcome Data: Not reported.

Conclusions: ATSDR's assessment of this site occurred in 1988; site data were not complete, but did not identify IJC critical pollutants as contaminants of concern. The site has been completely remediated since that time.

6.1.2 TRI Data for the Deer Lake AOC

The TRI onsite chemical releases for Marquette County, MI, are summarized in Table 6.1-C. Total onsite releases in 2001 were 1,000,114 pounds, the majority of which were released to air, followed by releases to land.

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 facilities that released these pollutants are listed in Table 6.1-D.

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).

6.1.3 NPDES Data for the Deer Lake AOC

The NPDES permitted discharges for Marquette County, MI are summarized in Table 6.1-E. The total average annual permitted discharges in 2004 were 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-F.

6.1.4 County Demographics and Health Status Data for the Deer Lake AOC

The demographic profiles, from the 2000 U.S. Census, for vulnerable populations living in Marquette County, MI, are as follows:

Children 6 years and younger	4,705
Females aged 15-44	14,166
Adults 65 years and older	8,739

According to the 2000 HRSA community health status reports, Marquette County health status indicators that compared unfavorably with those of the U.S. and also with the median of the peer counties were as follows (indicators that were above the upper limit of the peer county range are bolded):

Infant mortality (per 1000 births)

- neonatal infant mortality

Birth measures (as percent)

- none

Death measures (per 100,000 population)

- breast cancer (female)
- coronary heart disease
- **stroke**

6.1.5 Summary and Conclusions for the Deer Lake AOC

6.1.5.1 Hazardous Waste Sites

The only hazardous waste site categorized by ATSDR in public health hazard categories 1-3 did not appear to be associated with IJC critical pollutants and has been completely remediated.

At present, contamination of fish with mercury and problems with sewage are of concern at this site as reported by EPA (June 2004).

6.1.5.2 TRI Data

The TRI onsite chemical releases for Marquette County, MI, in 2001 were 1,000,114 pounds, the majority of which were released to air, followed by releases to land.

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).

6.1.5.3 NPDES Data

The NPDES permitted discharges for Marquette County, MI are summarized in Table 6.1-E. The total average annual permitted discharges in 2004 were 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-F.

6.1.5.4 County Demographics and Health Status Indicators

Vulnerable populations in Marquette County, MI, totaled 27,610. A few Marquette County health status indicators compared unfavorably with both U.S. indicators and with the median of peer county indicators. These health status indicators were neonatal infant mortality, and deaths from breast cancer, coronary heart disease, and **stroke**. Indicators that exceeded the peer county range are bolded.

6.1.5.5 Beneficial Use Impairments (BUIs)

Of the three health-related BUIs, restrictions on fish and wildlife consumption was the only BUI listed as impaired at this AOC site. Further information is available at the EPA web site (http://www.epa.gov/glnpo/aoc/).

Table 6.1-B Waste Site Contaminants that Exceeded Health-Based Screening Values
Deer Lake AOC

			Number of Records						
CAS No.	**Chemical Name**	**IJC Tracking Number**	**Air**	**Biota**	**Human Material**	**Other Media**	**Soil**	**Water**	**Total**
		Total IJC	**0**	**0**	**0**	**0**	**0**	**0**	**0**
000105-67-9	2,4-DIMETHYLPHENOL						1	1	2
000091-57-6	2-METHYLNAPHTHALENE						1	1	2
000208-96-8	ACENAPHTHYLENE						1		1
000071-43-2	BENZENE						1	1	2
000095-48-7	CRESOL, ORTHO-						1	1	2
000106-44-5	CRESOL, PARA-						1	1	2
000100-41-4	ETHYLBENZENE						1	1	2
000086-73-7	FLUORENE							1	1
000091-20-3	NAPHTHALENE						1	1	2
000085-01-8	PHENANTHRENE						1		1
000108-95-2	PHENOL							1	1
000127-18-4	TETRACHLOROETHYLENE						1		1
000108-88-3	TOLUENE						1	1	2
001330-20-7	XYLENES, TOTAL						1	1	2
000132-64-9	DIBENZOFURAN						1	1	2
MEDEXP-00-0			1			1	1	2	5
		Total Non-IJC	**1**	**0**	**0**	**1**	**14**	**14**	**30**
		Total	**1**	**0**	**0**	**1**	**14**	**14**	**30**

Table 6.1-C 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
	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-D 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-E 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-F 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

The Torch Lake AOC and its immediate environs, located on the Keweenaw Peninsula (Michigan's upper peninsula), 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. The contaminant problem shared by these areas is copper mining waste materials. The largest and only waste site within the AOC is the western shore of Torch Lake. Information regarding this site is taken from the 1989 ATSDR public health assessment, the 1998 ATSDR health consultation, and the 2003 EPA NPL fact sheet for the site.

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. These conclusions, along with information regarding the type and location of the site, and the date and type of assessment document, are summarized in Table 6.2-A, for the site that had a public health hazard category of 1-3 at some time during its assessment history.

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

Site Name	Public Health Hazard Category	EPA NPL Status	Site ID	City
Torch Lake	3 (1989 HA) 2 (1998 HC)	Final	MID980901946	Houghton County

3 = Indeterminate Public Health Hazard
2= Public Health Hazard
HA = Public Health Assessment
HC= Health Consultation

For this hazardous waste site, the number of contaminant records in HazDat that exceeded health based-screening values was 124, as shown in Table 6.2-B. Most of the records were for the soil media group.

The IJC Great Lakes critical pollutants accounted for 6 (5 %) of these records, all for the soil media group. The IJC critical pollutants that have been found at Houghton County hazardous waste sites at concentrations exceeding health-based screening values are: B(a)P, lead, and mercury. Details are provided in Table 6.2-C.

Further evaluation of the data for this site was conducted by ATSDR in the documents listed in the table. These evaluations are discussed in the following subsection.

6.2.1.1 Torch Lake

Torch Lake, a 2,700 acre lake located in the Keweenaw Waterway, was heavily polluted by copper mining activities from the 1890s until 1969. These activities resulted in mill tailings (stamp sands) being dumped into the lake and on the shoreline. The tailings were then dredged up and processed with flotation chemicals (creosotes and xanthates) to reclaim the copper, after

which the wastes were returned to the lake and the shoreline. Fish in the lake had a high incidence of tumors. The causative agent has not been identified. Information regarding this site is taken from the 1989 ATSDR public health assessment, the 1998 ATSDR health consultation, and the 2003 EPA NPL fact sheet for the site.

Category of Public Health Hazard: This site was categorized as an *Indeterminate Public Health Hazard* (Category 3) in 1989 by ATSDR because the site was of potential public health concern because of the risk that could result from the possible exposure to unknown etiologic agents (for cancer) at levels that may result in adverse health effects over time. In 1998, ATSDR concluded that some of the Torch Lake Area Brownfield properties posed a *Public Health Hazard* (Category 2) under long-term exposure from the metals in the soil. By this time, the incidence of tumors in Torch Lake fish had declined to normal. EPA reported (2006) that the Michigan Department of Natural Resources has not received any reports of fish tumors since 1993. In addition, the Michigan Department of Environmental Quality is currently in the process of removing the fish tumor BUI from their current list of BUIs.

Contaminants of Concern in Completed Exposure Pathways: None in 1989. In 1998, ATSDR concluded that levels of arsenic and the IJC critical pollutant lead in soil of some of the Brownfield properties were of health concern for long-term exposure from incidental ingestion (arsenic), or pica behavior (lead) on the properties being considered for residential development. Remediation of the area has included removal of drums buried in piles of tailings on the shore and in the lake, as well as contaminated soil beneath the drums. 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 indicates that contamination levels are within safety standards.

EPA reported (2006) that the Superfund program remedy consisted of covering almost 800 acres of tailings and slag piles with clean soil and vegetation to stabilize the soil. In September 2005, the Superfund program declared the site construction complete. Remediation of the approximately 480 acres of the Superfund site that were within the AOC was completed in 2002. This means that all planned remedial activities under the Superfund program have been completed.

Demographics: Demographic profile, from the 2000 U.S. Census, for vulnerable populations living within one 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 mentioned that 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 predominantly Scandinavian descent of the population. 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. Further details were not provided.

Conclusions: The more recent assessment by ATSDR was focused on Brownfield properties near the lake, and concluded that arsenic and possibly lead would be present in completed exposure pathways at levels of concern if some of the properties were to be developed residentially. Torch Lake, in the past, was directly impacted by the dumping of tailings into the lake and around the shoreline. EPA reported (2006) that all remedial activities under the Superfund program have been completed and that monitoring has indicated that contamination levels were within safe standards.

6.2.2 TRI Data for the Torch Lake AOC

The TRI onsite chemical releases for Houghton County, MI, are summarized in Table 6.2-C. Total onsite releases in 2001 were 487,148 pounds, all of which were released to air.

IJC critical pollutants accounted for only 0.332 pounds of the total onsite releases. The IJC critical pollutants released were lead and lead compounds (to air). The facilities that released these pollutants are listed in Table 6.2-D.

The largest release (408,000 pounds) of non-IJC chemicals was of ammonia (to air). No other chemicals release in quantities at least as large as 150,000.

6.2.3 NPDES Data for the Torch Lake AOC

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

6.2.4 County Demographics and Health Status Data for the Torch Lake AOC

The demographic profiles, from the 2000 U.S. Census, for vulnerable populations living in Houghton County, MI, are as follows:

Children 6 years and younger	2,719
Females aged 15-44	6,865
Adults 65 years and older	5,579

According to the 2000 HRSA community health status reports, Houghton County health status indicators that compared unfavorably with those of the U.S. and also with the median of the peer counties were as follows (indicators that were above the upper limit of the peer county range are bolded):

Infant mortality (per 1,000 births)

- none

Birth measures (as percent)

- **older mothers (40+)**

Death measures (per 100,000 population)

- coronary heart disease
- stroke

6.2.5 Summary and Conclusions for the Torch Lake AOC

6.2.5.1 Hazardous Waste Sites

The only hazardous waste site assessed in the public health hazard categories 1-3 by ATSDR was Torch Lake. The more recent assessment by ATSDR was focused on Brownfields properties near the lake, and concluded that arsenic and possibly the IJC critical pollutant lead would be present in completed exposure pathways at levels of concern if some of the properties were to be developed residentially. Many of the Brownfield sites have been remediated and no longer pose a threat as reported by EPA (June 2004).

Torch Lake, in the past, was directly impacted by the dumping of tailings into the lake and around the shoreline. The older ATSDR assessment noted that fish had high incidences of tumors in the past, and the etiologic agent was not known. Tumor incidences in fish have returned to normal.

Remediation has been conducted, and monitoring indicates that contamination levels are within safety standards. EPA reported (2004) that exposure of residents to contaminants at this site (e.g., pica ingestion by children) no longer existed. EPA reported (2006) that, since 1999 when Superfund remediation began, almost 800 acres of the Torch Lake Superfund site have been remediated. However, only a small portion of the 800 acres (approximately 480 acres) is located within the boundaries of the Torch Lake AOC.

6.2.5.2 TRI Data

The TRI onsite chemical releases for Houghton County, MI in 2001 were 487,148 pounds, all of which were released to air.

IJC critical pollutants accounted for only 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.

6.2.5.3 NPDES Data

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

6.2.5.4 County Demographics and Health Status Indicators

Vulnerable populations in Houghton County, MI, totaled 15,163. A few Houghton County health status indicators compared unfavorably with both U.S. indicators and with the median of

peer county indicators. These health status indicators were **older mothers**, and deaths from coronary heart disease and stroke. Indicators that exceeded the peer county range are bolded.

6.2.5.5 Beneficial Use Impairments (BUIs)

Of the three health-related BUIs, restriction on fish and wildlife consumption is the only beneficial use impaired at this AOC site. Further information is available at the EPA web site (http://www.epa.gov/glnpo/aoc/)

Table 6.2-B Waste Site Contaminants that Exceeded Health-Based Screening Values
Torch Lake AOC

			Number of Records						
CAS No.	**Chemical Name**	**IJC Tracking Number**	**Air**	**Biota**	**Human Material**	**Other Media**	**Soil**	**Water**	**Total**
000050-32-8	BENZO(A)PYRENE	4					2		2
007439-92-1	LEAD	8					2		2
007439-97-6	MERCURY	9					2		2
		Total IJC	**0**	**0**	**0**	**0**	**6**	**0**	**6**
000106-46-7	1,4-DICHLOROBENZENE							2	2
000083-32-9	ACENAPHTHENE						2		2
000067-64-1	ACETONE							2	2
007429-90-5	ALUMINUM							2	2
000120-12-7	ANTHRACENE						4		4
007440-38-2	ARSENIC						2		2
007440-39-3	BARIUM						2		2
000056-55-3	BENZO(A)ANTHRACENE						2		2
000205-99-2	BENZO(B)FLUORANTHENE						2		2
000191-24-2	BENZO(GHI)PERYLENE						2		2
000207-08-9	BENZO(K)FLUORANTHENE						2		2
007440-41-7	BERYLLIUM						2		2
007440-43-9	CADMIUM		2						2
007440-70-2	CALCIUM		2						2
000074-87-3	CHLOROMETHANE							2	2
007440-47-3	CHROMIUM						2		2
000218-01-9	CHRYSENE						2		2
007440-48-4	COBALT						2		2
007440-50-8	COPPER						6		6
000117-81-7	DI(2-ETHYLHEXYL)PHTHALATE						2		2
000053-70-3	DIBENZO(A,H)ANTHRACENE						2		2
000084-66-2	DIETHYL PHTHALATE						2		2
000084-74-2	DI-N-BUTYL PHTHALATE						2		2
000206-44-0	FLUORANTHENE						4		4
000193-39-5	INDENO(1,2,3-CD)PYRENE						2		2
007439-89-6	IRON		2					2	4
007439-93-2	LITHIUM						2		2
007439-95-4	MAGNESIUM						2		2
007439-96-5	MANGANESE		2				2		4
HZ0900-01-T	METALS N.O.S.					2			2
000075-09-2	METHYLENE CHLORIDE							2	2
007439-98-7	MOLYBDENUM						2		2
000091-20-3	NAPHTHALENE						2		2
007440-02-0	NICKEL						2		2
000085-01-8	PHENANTHRENE						4		4
130498-29-2	POLYCYCLIC AROMATIC HYDROCARBONS					4	2		6
000129-00-0	PYRENE						4		4
007782-49-2	SELENIUM						2		2
007440-22-4	SILVER						2		2
007440-24-6	STRONTIUM						2		2
007440-32-6	TITANIUM		2				2		4
007440-62-2	VANADIUM						2		2
007440-66-6	ZINC						2		2
MEDEXP-00-0				2			4	4	10
		Total Non-IJC	**10**	**2**	**0**	**6**	**84**	**16**	**118**

			Number of Records						
CAS No.	Chemical Name	IJC Tracking Number	Air	Biota	Human Material	Other Media	Soil	Water	Total
		Total	10	2	0	6	90	16	124

Table 6.2-C 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-D 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
		PENINSULA COPPER INDS. INC.	49934PNNSL1700D	HUBBELL

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

Chemical	IJC Tracking Number	Discharge
	Total IJC	**0**
PHOSPHORUS, TOTAL (AS P)		9490
	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 St. Louis River and Bay AOC is the 39 miles of the St. Louis River below Cloquet, MN.

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

ATSDR has evaluated the data for hazardous waste sites in the counties relevant to this AOC, and reached conclusions regarding the public health threat posed by these sites. These conclusions, along with information regarding the type and location of the site, and the date and type of assessment document, are summarized in Table 6.3-A, for sites that had public health hazard categories of 1-3 at some point during their assessment history. (No waste sites in Carlton County, MN, were assessed by ATSDR.)

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

Site Name, County	Public Health Hazard Category	EPA NPL Status	Site ID	City
Arrowhead Refinery Co., St Louis	3 (1986 HA) 2 (1993 HA)	Final	MND980823975	Hermantown
St. Louis River site, St. Louis	3 (1989 HA) 2 (2001 HC)	Final	MND039045430	St. Louis County
Koppers Co. Superior Plant, Douglas	2 (2001 HC) 3 (2003 HC)	Non NPL	WID006179493	Superior

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

For hazardous waste sites relevant to this AOC that at any time had Public Health Hazard Categories of 1-3, the number of contaminant records in HazDat that exceeded health based-screening values was 737, as shown in Table 6.3-B. Most of the records were for the soil and water media groups.

The IJC Great Lakes critical pollutants accounted for 80 (11%) of these records, with the majority for the soil media group. The IJC critical pollutants that have been found at these hazardous waste sites at concentrations exceeding health-based screening values are: PCBs, PCDDs, PCDFs, B(a)P, DDT and metabolites, lead, mercury, methyl mercury, and hexachlorobenzene. Details are provided in Table 6.3-C.

Further evaluation of the data for the sites with Public Health Hazard Categories of 1-3 was conducted by ATSDR in the public health assessments and other health-related documents listed in the table. These evaluations are discussed in the following subsections.

6.3.1.1 Arrowhead Refinery Company

The 10-acre Arrowhead Refinery site is located about 8 miles northwest of Duluth in Hermantown, St. Louis County, MN. Prior to 1945, the facility re-tinned milk cans. From 1945 to 1977, Arrowhead Refinery recycled waste oil. In 1977, it was ordered to stop onsite dumping

of a waste sludge from the oil refining process. Information regarding this site was taken from the 1993 ATSDR public health assessment, HazDat, and the 2003 EPA NPL fact sheet for the site.

Category of Public Health Hazard: This site was categorized as an *Indeterminate Public Health Hazard* (Category 3) by ATSDR in a 1986 health assessment. In 1993, ATSDR concluded that the site is a *Public Health Hazard* (Category 2) because of the potential for health effects from future exposures if the site is not cleaned up.

Contaminants of Concern in Completed Exposure Pathways: None at the time of the 1993 assessment. The site is securely fenced. Contaminants of concern onsite included groundwater plumes of chlorinated and aromatic organic compounds. Sludge onsite was very corrosive and acidic, with high concentrations of metals as well as toxic and carcinogenic organic compounds. Odor from the sludge is noticeable onsite and offsite, and described as heavy and acidic. Onsite investigators have attributed headaches and nausea to the site's air quality. No air monitoring has been performed. Groundwater onsite and downgradient of the site contains manganese at levels above health-based screening values. ATSDR concluded that processes resulting from the onsite contamination have provided a mechanism for the mobilization and transport of manganese by groundwater at the site. In the past, residents with down-gradient private wells may have been exposed to manganese at levels of health concern, but municipal water has been extended to downgradient residents near the site. The IJC critical pollutant B(a)P has been found in subsurface soil at very high concentration, but not in a completed exposure pathway. Since the 1993 health assessment, the site has been fully remediated, including the excavation and treatment of sludge, excavation and offsite disposal of soils and sediments, and installation of groundwater extraction and treatment.

Demographics: Demographic profile, from the 2000 U.S. Census, for vulnerable populations living within one mile of this site:

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

Public Health Outcome Data: Not reported.

Conclusions: This heavily contaminated site has been remediated. No contaminants were found in completed exposure pathways at levels of health concern at the time of ATSDR's 1993 health assessment. Migration of contaminants offsite did not seem to have occurred.

6.3.1.2 St. Louis River Site

This site actually comprises two sites: the 255-acre St. Louis River/Interlake/Duluth Tar site and the 640-acre U.S. Steel site, located in western Duluth on the St. Louis River. The U.S. Steel site operated an integrated steel mill from about 1915 to 1979. There is extensive contamination of soil, surface water, and groundwater with coke and tar products, which contain high concentrations of PAHs. The Interlake Duluth Tar site was used by several companies for iron,

steel, and tar manufacturing from the late 1800s until about 1960. This site also is extensively contaminated with PAHs. Information regarding this site is taken from the 1989 ATSDR public health assessment, HazDat, and the 2003 EPA NPL fact sheet for this site.

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

Contaminants of Concern in Completed Exposure Pathways: None identified by the 1989 ATSDR health assessment. For both sites, PAHs are the primary contaminants of concern. Data for individual PAHs were not reported, but it is likely that the IJC critical pollutant B(a)P was present at levels of concern. Soil, surface water, groundwater, and sediments are contaminated with a variety of hazardous substances including PAHs, SVOCs, heavy metals, and VOCs. According to the NPL fact sheet for this site, remediation activities have included removal of tar seeps, contaminated soil, and sediments; and solidification of some wastes in-place, with capping. Additional sediment requires remediation, and groundwater, which discharges into the river, is being evaluated.

Demographics: Demographic profile, from the 2000 U.S. Census, for vulnerable populations living within one mile of this site:

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

Public Health Outcome Data: Not reported.

Conclusions: This site appears to have contributed to the contaminant burden of the St. Louis River, particularly with regard to PAHs, and probably including IJC critical pollutant B(a)P. HazDat documentation for 2001 shows dioxin, furans, mercury, PCB, and PAHs contaminating sediment onsite. Offsite, methylmercury has contaminated fish. ATSDR recommended the cleanup of sediments and other remedial actions (e.g., dredging contaminated sediments) and evaluating human health risks for these remedial actions. Remedial actions have included the removal of sediments at this site.

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 chemicals related to wood treatment processes. Information regarding this site is taken from the 2003 ATSDR health consultation for the site.

Category of Public Health Hazard: ATSDR concluded that the contaminated soils and sediments are a public health hazard in its 2001 health consultation. This site was categorized by

ATSDR as an *Indeterminate Public Health Hazard* (Category 3) for PCDD and PCDF contamination of fish in its 2003 health consultation.

Contaminants of Concern in Completed Exposure Pathways: According to the summary in the 2003 health consultation, the 2001 health consultation concluded that creosote wastes and PAHs in the soils and sediments of lower Crawford Creek are a human health concern. PCDDs and PCDFs were also present in these media, but the contamination was not well characterized and apparently was not at levels of health concern. Further monitoring, including of fish and wildlife, was needed. The 2003 health consultation evaluated the adequacy of modeled fish concentrations as a basis for assessing health risk. ATSDR concluded that it could not, on the basis of that information, confidently conclude that fish from Crawford Creek and the Nemadji River basis do not contain unsafe levels of PCDDs and PCDFs, and that fish in those areas therefore pose an indeterminate health risk.

Demographics: Not reported.

Public Health Outcome Data: Not reported.

Conclusions: The Koppers facility has contaminated the Crawford Creek basin with PAHs, probably including the IJC critical pollutant B(a)P, and other creosote-related chemicals at levels of public health concern. Whether PCDDs and PCDFs have accumulated in fish to levels of concern could not be determined.

6.3.2 TRI Data for the St. Louis River and Bay AOC

The TRI onsite chemical releases for St. Louis and Carlton Counties, MN, and Douglas County, WI, are summarized in Table 6.3-C. Total onsite releases in 2001 were 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 facilities that released these pollutants are listed in Table 6.3-D.

The largest onsite release (300,000-499,999 pounds) of non-IJC chemicals was of methanol (to air). The next largest release category (150,000-299,999 pounds) also had only one chemical, barium compounds (primarily to land).

6.3.3 NPDES Data for the St. Louis River and Bay AOC

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

6.3.4 County Demographics and Health Status Data for the St. Louis River and Bay AOC

The demographic profile, from the 2000 U.S. Census, for vulnerable populations living in the three counties of this AOC is shown in Table 6.3-F.

Table 6.3-F County Demographic Profiles for the St. Louis River and Bay AOC

Vulnerable population	St. Louis County, MN	Carlton County, MN	Douglas County, WI	Total for AOC
Children 6 years and younger	14,995	2,631	1,288	18,914
Females aged 15-44	41,312	6,140	3,047	50,499
Adults 65 years and older	32,274	4,784	3,903	40,961

According to the 2000 HRSA community health status reports, health status indicators that compared unfavorably with those of the U.S. and also with the median of the peer counties for the two counties relevant to this AOC were as follows:

St. Louis County, MN
Infant mortality (per 1,000 births)
- none

Birth measures (as percent)
- none

Death measures (per 100,000 population)
- stroke

Carlton County, MN
Infant mortality (per 1,000 births)
- none

Birth measures (as percent)
- none

Death measures (per 100,000 population)
- stroke

Douglas County, WI
Infant mortality (per 1,000 births)
- infant mortality
- post-neonatal infant mortality

Birth measures (as percent)
- none

Death measures (per 100,000 population)
- breast cancer (female)
- colon cancer
- coronary health disease
- stroke

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

6.3.5.1 Hazardous Waste Sites

Three hazardous waste sites relevant to this AOC were evaluated by ATSDR as public health hazard categories 1-3. The IJC critical pollutant B(a)P [or total PAHs, probably including B(a)P], was a contaminant of concern at all three sites, and in a completed exposure pathway (form soil and sediment) at one site. EPA reported (2006) that sediment evaluation projects had been undertaken at this AOC under the Great Lakes Legacy Act. Information for the other two sites was not provided so as to determine completed exposure pathways, but one of those sites has been completely remediated and the other partially remediated.

Issues for Follow-Up

St. Louis River site: Information regarding completed exposure pathways may be available in the 2001 ATSDR health consultation. This site (comprising two sites on the river) has not been completely remediated, and appears to have contributed significantly to the river's burden of contaminants, including B(a)P.

Koppers Co. Superior Plant: ATSDR was concerned that the levels of PCDDs and PCDFs in sediment of the nearby creek may bioaccumulate into fish at levels of concern. None of the site-related contaminants in the creek soil and sediments had been cleaned up as of the 2003 ATSDR health consultation.

6.3.5.2 TRI Data

The TRI onsite chemical releases for St. Louis and Carlton Counties, MN, and Douglas County, WI, in 2001 were 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 chemicals was of methanol (to air). The next largest release category (150,000-299,999 pounds) also had only one chemical, barium compounds (primarily to land).

6.3.5.3 NPDES Data

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

6.3.5.4 County Demographics and Health Status Indicators

Total vulnerable populations were 88,581 for St. Louis County, MN, 13,555 for Carlton County, MN, and 8,238 for Douglas County, WI. St. Louis and Carlton Counties each had only one health status indicator (deaths from stroke) that compared unfavorably with both the U.S. and the median of the peer counties. Douglas County, however, had several that compared unfavorably: two infant mortality indicators and four death measures (breast cancer, colon cancer, coronary heart disease, and stroke).

6.3.5.5 Beneficial Use Impairments (BUIs)

Of the three health-related BUIs, restrictions on fish and wildlife consumption and beach closings were the two BUIs listed as impaired at this AOC site. Further information is available at the EPA web site (http://www.epa.gov/glnpo/aoc/).

Table 6.3-B Waste Site Contaminants that Exceeded Health-Based Screening Values
St. Louis River and Bay AOC

			Number of Records						
CAS No.	**Chemical Name**	**IJC Tracking Number**	**Air**	**Biota**	**Human Material**	**Other Media**	**Soil**	**Water**	**Total**
001336-36-3	POLYCHLORINATED BIPHENYLS	1				6	2		8
001746-01-6	2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN	2					2		2
HZ0400-02-T	POLYCHLORINATED DIBENZO-P-DIOXINS	2				2			2
051207-31-9	2,3,7,8-TETRACHLORODIBENZOFURAN	3					2		2
HZ0500-02-T	POLYCHLORINATED DIBENZOFURANS	3				2			2
000050-32-8	BENZO(A)PYRENE	4					7		7
HZ1500-50-T	BENZO(A)PYRENE EQUIVALENTS	4					1		1
HZ1500-02-T	PAHS (CARCINOGENIC)	4					6	2	8
000072-54-8	DDD, P,P'-	5				2			2
000050-29-3	DDT, P,P'-	5				2			2
007439-92-1	LEAD	8				4	14	6	24
007439-97-6	MERCURY	9				2	10	2	14
022967-92-6	METHYLMERCURY	9		2					2
000118-74-1	HEXACHLOROBENZENE	11				2	2		4
		Total IJC	**0**	**2**	**0**	**22**	**46**	**10**	**80**
000071-55-6	1,1,1-TRICHLOROETHANE					2	6	2	10
000079-34-5	1,1,2,2-TETRACHLOROETHANE						2		2
000079-00-5	1,1,2-TRICHLOROETHANE						2		2
000075-35-4	1,1-DICHLOROETHENE					2		2	4
000107-06-2	1,2-DICHLOROETHANE						4	2	6
000156-60-5	1,2-DICHLOROETHENE, TRANS-							4	4
000541-73-1	1,3-DICHLOROBENZENE							2	2
000090-12-0	1-METHYLNAPHTHALENE						2	2	4
000105-67-9	2,4-DIMETHYLPHENOL							2	2
000121-14-2	2,4-DINITROTOLUENE						2		2
000606-20-2	2,6-DINITROTOLUENE							2	2
000078-93-3	2-BUTANONE					2	2	2	6
000091-57-6	2-METHYLNAPHTHALENE					2	4	2	8
000083-32-9	ACENAPHTHENE						2		2
000208-96-8	ACENAPHTHYLENE						2	2	4
000067-64-1	ACETONE							2	2
012587-46-1	ALPHA RADIATION							2	2
007429-90-5	ALUMINUM					2	4	6	12
000120-12-7	ANTHRACENE						2	2	4
007440-36-0	ANTIMONY						2	2	4
007440-38-2	ARSENIC						4	2	6
007440-39-3	BARIUM							2	2
000071-43-2	BENZENE					4	8	2	14
000092-87-5	BENZIDINE							2	2
000056-55-3	BENZO(A)ANTHRACENE						7		7
000203-33-8	BENZO(A)FLUORANTHENE						1		1
000205-99-2	BENZO(B)FLUORANTHENE						4		4
000192-97-2	BENZO(E)PYRENE						2		2
000191-24-2	BENZO(GHI)PERYLENE						4		4
000207-08-9	BENZO(K)FLUORANTHENE						5		5
000065-85-0	BENZOIC ACID							2	2
000100-51-6	BENZYL ALCOHOL							4	4
007440-41-7	BERYLLIUM					2	4	6	12
000111-44-4	BIS(2-CHLOROETHYL) ETHER							2	2
007440-42-8	BORON							2	2

			Number of Records						
CAS No.	Chemical Name	IJC Tracking Number	Air	Biota	Human Material	Other Media	Soil	Water	Total
000075-27-4	BROMODICHLOROMETHANE							2	2
000075-25-2	BROMOFORM							2	2
000085-68-7	BUTYL BENZYL PHTHALATE						4	2	6
007440-43-9	CADMIUM						4	2	6
007440-70-2	CALCIUM							2	2
000075-15-0	CARBON DISULFIDE							2	2
000056-23-5	CARBON TETRACHLORIDE						6		6
000124-48-1	CHLORODIBROMOMETHANE							2	2
000075-00-3	CHLOROETHANE							2	2
000067-66-3	CHLOROFORM						2	2	4
007440-47-3	CHROMIUM						8	8	16
000218-01-9	CHRYSENE						7		7
007440-48-4	COBALT					2	4	4	10
007440-50-8	COPPER						8	2	10
HZ1600-59-T	CREOSOTE WASTES						4		4
000095-48-7	CRESOL, ORTHO-							2	2
000106-44-5	CRESOL, PARA-						2	2	4
000057-12-5	CYANIDE					2	2	2	6
000117-81-7	DI(2-ETHYLHEXYL)PHTHALATE					2	2	2	6
000053-70-3	DIBENZO(A,H)ANTHRACENE						5		5
000131-11-3	DIMETHYL PHTHALATE					2	2	2	6
000084-74-2	DI-N-BUTYL PHTHALATE							2	2
000117-84-0	DI-N-OCTYL PHTHALATE							2	2
000100-41-4	ETHYLBENZENE						2	2	4
000206-44-0	FLUORANTHENE						2		2
000086-73-7	FLUORENE						4	2	6
HZ0600-47-T	FUEL RELATED ORGANICS						1		1
HZ0900-02-T	HEAVY METALS, UNSPECIFIED					2	2	2	6
HZ1000-01-T	HYDROCARBONS, UNSPECIFIED						3		3
000193-39-5	INDENO(1,2,3-CD)PYRENE						3		3
007439-89-6	IRON					2		2	4
007439-93-2	LITHIUM						2	2	4
007439-95-4	MAGNESIUM					2	6	6	14
007439-96-5	MANGANESE						2	10	12
HZ0900-01-T	METALS N.O.S.					2		2	4
000108-10-1	METHYL ISOBUTYL KETONE						4	2	6
000075-09-2	METHYLENE CHLORIDE					4	4	4	12
000091-20-3	NAPHTHALENE						6	2	8
007440-02-0	NICKEL					2	10	6	18
000086-30-6	N-NITROSODIPHENYLAMINE							2	2
HZ2000-06-T	NON-AQUEOUS PHASE LIQUIDS (NAPL)						2		2
029082-74-4	OCTACHLOROSTYRENE					2			2
HZ0600-01-T	OIL/GREASE, UNSPECIFIED					2			2
HZ0700-01-T	ORGANOCHLORINES, UNSPECIFIED					2	2		4
HZ1500-03-T	PAHS (NON-CARCINOGENIC)						2	2	4
000087-86-5	PENTACHLOROPHENOL						2		2
000198-55-0	PERYLENE						2		2
000085-01-8	PHENANTHRENE					2	6	2	10
000108-95-2	PHENOL						2	2	4
064743-03-9	PHENOLICS					2	2		4
HZ1400-01-T	PHTHALATES, UNSPECIFIED							2	2
130498-29-2	POLYCYCLIC AROMATIC HYDROCARBONS			2		6	37	8	53
007440-09-7	POTASSIUM					2	4	6	12
000129-00-0	PYRENE						4	2	6

			Number of Records						
CAS No.	**Chemical Name**	**IJC Tracking Number**	**Air**	**Biota**	**Human Material**	**Other Media**	**Soil**	**Water**	**Total**
007440-22-4	SILVER							2	2
007440-23-5	SODIUM							4	4
007440-24-6	STRONTIUM							2	2
HZ1000-29-T	STYRENE/O-XYLENE						2		2
HZ1600-51-T	TAR SLUDGE						4		4
HZ0400-03-T	TCDD EQUIVALENTS						3		3
000127-18-4	TETRACHLOROETHYLENE					2	2	4	8
007440-28-0	THALLIUM							2	2
007440-31-5	TIN						4		4
000108-88-3	TOLUENE						2	2	4
HZ1000-15-T	TOTAL PETROLEUM HYDROCARBONS					2			2
000079-01-6	TRICHLOROETHYLENE					2	6	6	14
007440-62-2	VANADIUM					2	4	6	12
000075-01-4	VINYL CHLORIDE						2	6	8
HZ1900-01-T	VOLATILE ORGANIC COMPOUNDS N.O.S.						4	2	6
001330-20-7	XYLENES, TOTAL						2	2	4
007440-66-6	ZINC					2	12	6	20
000132-64-9	DIBENZOFURAN						2		2
MEDEXP-00-0			4	4		4	12	14	38
PENDING	FLUFFY CONTAMINATED MATERIAL						2		2
			2	4		3	14	6	29
		Total Non-IJC	**6**	**10**	**0**	**73**	**328**	**240**	**657**
		Total	**6**	**12**	**0**	**95**	**374**	**250**	**737**

Table 6.3-C 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
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
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

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
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-D 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-E 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**