Attachment A. Background on St. Louis Bay and its Area of Concern (AOC) Designation

The geographic region outlining the St. Louis River AOC includes the St. Louis River from upstream of the City of Cloquet downstream to Lake Superior, and the Nemadji River watershed. Consideration was given to factors within the St. Louis River watershed contributing to problems found in the surface waters of this area. Most of the actions included in the St. Louis River AOC RAP (remedial action plan) update focus on the St. Louis River below Fond du Lac Dam, where the Radio Tower Bay (RTB) is located.

The St. Louis River was originally listed as an AOC in 1987 because of the large amount of suspended solids, nutrients, and biochemical oxygen demand discharged to the river from various industries and communities. By 1992 when the AOC Stage I RAP was developed, much of these discharges were being treated as required by the Clean Water Act, and the primary concerns for the AOC were legacy contamination and historical habitat degradation, as well as excess sediment and nutrient inputs. These sources of impairment led to the designation of nine of the possible 14 beneficial use impairments (BUIs).

The majority of the BUIs for the St. Louis River AOC are related to historical habitat loss from extensive filling of wetlands, dredging of shallow aquatic habitat, and inputs of harmful chemicals that contaminated the sediments and water in the estuary. Since 1861, approximately 3,400 acres of wetlands have been lost in the estuary through a combination of dredging and filling; this includes 1,700 acres of shallow, open-water aquatic habitat in St. Louis Bay and Superior Bay that was converted to deep shipping channels.

As one of 43 AOCs identified around the Great Lakes, the St. Louis River Estuary has undergone a remedial action planning process that resulted in the development of the Habitat Plan. The Habitat Plan and subsequent identification of projects that will lead to delisting of the estuary as an AOC has been accomplished by a broad based group of AOC partners. These include state fish and wildlife agencies from Minnesota and Wisconsin, the Fond du Lac Band of Lake Superior Chippewa, the MLT, the Fish and Wildlife Service, the Minnesota Pollution Control Agency (MPCA), Minnesota Sea Grant, the United States Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the Western Wisconsin Land Trust. The proposed project is included in the Habitat Plan and the project has the support of agencies and groups represented on the Habitat Workgroup.

As reported in AOC staging documents, industrialization of the bay began with dredging of Duluth harbor and the construction of the first rail line in late 1860s. Numerous industries (shipping, steel, paper, lumber, tanneries, etc.) were established along the St. Louis Bay and the St Louis River and several dams were constructed on the river over the next hundred years. The lower St. Louis River has been developed for production of hydroelectric power since 1907. Wastewater from surrounding communities was routinely discharged into the river. Lake Superior seiches, shipping, nonpoint runoff, atmospheric fallout, industrial discharges, wastewater treatment plants, and dredging were cited as factors affecting the water quality. Radio Tower Bay was mainly affected by organic debris deposited into the bay from sawmills that operated on the bay until the late 1800s.

As the river's aquatic resources further declined, efforts to reduce the amount of pollution from a variety of sources were strengthened. Sediment studies identified significant areas of the bay contained contaminated sediments.

Despite improvements in water quality of the river and harbor by the mid-70's, the cumulative effects of years of waste disposal in the river and bay area led to a ranking of one of the 43 "Areas of Concern" on the Great Lakes. The AOC was developed to help restore the lower SLB to meet water quality standards. The increased scrutiny of residual pollutant levels and fish tissue sampling lead the health departments of Minnesota and Wisconsin to issue fish consumption advisories in 1985 based on mercury and PCB

contamination. The current status of the St. Louis River and Duluth-Superior harbor includes the fish consumption advisories, identification of two Superfund hazardous waste sites, and continued debate over the "contaminated" status of the sediments.

As reported in 2013 by LimnoTech, the St. Louis River Sediment Characterization Project was undertaken to evaluate and summarize the levels of sediment contaminants throughout the AOC based on the significant amount of existing sediment contaminant data. This work was done to support the MPCA and WDNR in defining the general level of remedial action needed for sites across the AOC to support BUI removal strategies. The summarized contaminant data included the following:

- Total polycyclic aromatic hydrocarbon (PAH) values were calculated using the 13 priority PAHs;
- Metals values were preferentially based on total metal measurements but for samples without a total metals measurement, the simultaneously extracted metal value was substituted;
- Total polychlorinated biphenyls (PCBs) were preferentially calculated as congener sums; but for samples without a PCB congener measurement, the sum of Aroclors was substituted; and
- Tetrachlorinated dibenzo-p-dioxin (TCDD) Toxic Equivalents (TEQ) values were calculated using Fish Ecological Risk Toxic Equivalency Factors (TEFs) based on 1998 World Health Organization (WHO) (reported as PCDD/F).

The Lower St. Louis River watershed contains estuarine wetland and aquatic habitats, a baymouth bar complex, an uplands supporting large areas of forest vegetation. The combination of habitats is very unusual for Lake Superior, the Upper Midwest, the Great Lakes region, and the world. The lower 21 river miles of the St. Louis River include a 12,000 acre freshwater estuary that supports unique ecosystems as well as the largest harbor and international port on the Great Lakes. Along with the port facility, the lower estuary is flanked by a number of industrial users interspersed with vacant or undeveloped tracts.

As the river approaches Duluth and Superior, it takes on the characteristics of a freshwater estuary. The estuary is characterized by numerous backwater areas and bays, as well as islands. Parts of the upper estuary are almost wilderness-like at present. The St. Louis River wetlands are the largest such complex along Lake Superior, representing a significant source of productivity for the entire Lake Superior ecosystem. The freshwater estuary and baymouth bar systems are virtually absent elsewhere in the interior of North America. The estuary and its tributaries are unusual in having such a variety of habitat types supporting a large and diverse assemblage of native fish species. In spite of human impacts, the Lower St. Louis River ecosystem is reestablishing its significance, both regionally and globally. The Lower St. Louis River and Bay contains the only estuarine habitat in Minnesota. Estuarine habitats extend 21 river miles upstream from Lake Superior.

The St. Louis Bay estuary serves as an important nursery and feeding area for abundant and diverse populations of fish and wildlife that rely on them for shelter, food, and spawning areas. The fisheries of the Great Lakes and its connected river systems are closely linked to the freshwater estuary. Over 90 percent of the approximately 200 species of fish in the Great Lakes are directly dependent on coastal wetlands for some part of their life cycle. The St. Louis River Estuary serves as the primary nursery for the more than 40 native fish species found in western Lake Superior, including walleye, lake sturgeon, muskellunge, northern pike and smallmouth bass.

The St. Louis Estuary is considered very valuable habitat for waterfowl feeding, nesting, and migration. The area serves as a corridor for migrating songbirds, shorebirds, and raptors. The coastal wetlands of freshwater estuaries offer critical food and shelter for these migrants. More than 230 bird species have been documented. Birds seen foraging in the marshes include the bald eagle, osprey, merlin, common tern, merlin, northern harrier and belted kingfisher. Resident birds include double-crested cormorant, Virginia rail, sora, marsh wren, common yellow-throat, swamp sparrow, song sparrow and yellow warbler, and a variety of waterfowl.