

Chapter 3 Affected Environment, Environmental Consequences & Mitigation

This chapter provides a description of the existing environmental conditions of the project area and of the reasonably foreseeable environmental consequences of the preliminary preferred alternative. This chapter also describes impacts from Alternative 13 and the no action alternative and provides the scientific and analytic basis for comparison between the preliminary preferred alternative and these other alternatives.

This joint Federal EA/State EAW has been prepared to evaluate the proposed project in accordance with the requirements of both the FAA and the Minnesota Environmental Quality Board (EQB). This joint document combines and integrates the required information from both requirements into a single document.

3.1 Air Quality (*EAW Item 16.a. and Item 16.b.*)

EAW Item 16.a. Stationary source emissions - Describe the type, sources, quantities and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants, and any greenhouse gases. Discuss effects to air quality including any sensitive receptors, human health or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.

EAW Item 16.b. Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.

The Clean Air Act (CAA), which was last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards [NAAQS - 40 Code of Federal Regulations (CFR) part 50] for pollutants considered harmful to public health and the environment. The CAA established two types of national air quality standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

The EPA uses six criteria pollutants as indicators of air quality and has established for each a maximum concentration above which adverse effects on human health may occur. The six criteria pollutants include ozone, which includes 1-hour ozone and 8-hour ozone; carbon monoxide; nitrogen dioxide; sulfur dioxide; particulate matter, which includes PM-10 and PM-2.5; and lead. EPA air quality classifications include:

- Nonattainment – any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
- Attainment – any area [other than an area identified in clause (i)] that meets the national primary or secondary ambient air quality standard for the pollutant.
- Unclassifiable – any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.
- Maintenance Areas – are previously nonattainment areas that now meet standards.

The information on the EPA Greenbook website (<http://www.epa.gov/air/oaqps/greenbk/index.html>) indicates that there are no non-attainment areas in the City of Duluth and surrounding areas. However, the City of Duluth, including the Airport, is a Maintenance Area for carbon monoxide (CO).

FAA guidance in Order 1050.1E, Section 2.4b states that procedures for air quality analyses are provided in the report *Air Quality Procedures for Civilian Airports and Air Force Bases*. In that report, a NAAQS assessment is required if a project at an airport would have forecasted aviation activity of more than 180,000 annual operations. The current annual operations at the Airport are estimated to be 13,900 according to the current FAA Form 5010 Airport Master Record, below the threshold of operations that would generate emissions in excess of NAAQS conformity standards. According to the FAA Terminal Area Forecasts (Fiscal Year 2012-2032), operations at the Airport are expected to remain at current levels. Any future growth in operations is not expected to result in any substantial change in the number of aircraft operations or the type of aircraft using the Airport. Because the current and forecasted operations are considerably less than the cited thresholds, the potential for degradation of air quality is low and a NAAQS assessment is not required. Air quality analysis may be required for air emissions due to construction traffic.

There are no stationary sources of air emissions at the Duluth-Sky Harbor Airport.

3.1.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short would not directly result in any substantial change in the number of aircraft operations, the type of aircraft using the Airport or automobile traffic at the Airport. Therefore, Alternative 5a Short would not directly contribute to a change or increase in generation of emissions at the Airport.

An air quality analysis for construction emissions will be completed once the route and extent of trucking necessary to bring material to and from the Airport is known.

Alternative 13

Alternative 13 would not directly result in any substantial change in the number of aircraft operations, the type of aircraft using the Airport or automobile traffic at the Airport. Therefore, Alternative 13 would not directly contribute to a change or increase in generation of emissions at the Airport.

An air quality analysis for construction emissions will be completed once the route and extent of trucking necessary to bring material to and from the Airport is known.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. Due to Airport closure, aircraft traffic at the Airport and the immediate vicinity would presumably be reduced, thus reducing the emissions generated at the Airport site.

An air quality analysis for construction emissions will be completed once the route and extent of trucking necessary to remove material for demolition of the Airport is known.

3.2 Biological Resources

3.2.1 Fish, Wildlife, and Plants (*EAW Item 7, Item 13.a., Item 13.c., and Item 13.d.*)

EAW Item 7. Cover types. Estimate the acreage of the site with each of the following cover types before and after development.

EAW Item 13.a. Describe fish and wildlife resources as well as habitats and vegetation on or in near the site.

EAW Item 13.c. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.

EAW Item 13.d. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

3.2.1.1 Ecological Setting

The project site is within the Northern Superior Uplands (NSU) Section, and more specifically the North Shore Highlands Subsection as defined by the MNDNR Ecological Classification System (ECS) *Field Guide to the Native Plant Communities of Minnesota: the Laurentian Mixed Forest Province* (MNDNR 2003). Assessment of onsite vegetation and wildlife has been completed through numerous field reconnaissance efforts over many years to characterize the unique natural habitat associated with Minnesota Point. The Minnesota Biological Survey (MBS) has assigned native plant community descriptions on the surrounding forest, shrub, and beach native plant communities following the MNDNR's ECS (MNDNR 2003), as depicted in **Figures 3-1a** through **3-1b**.

Vegetative cover immediately surrounding the existing Airport facilities is maintained by mowing to keep grasses and shrubs low to the ground as to not create any potential vegetative obstructions for aircraft utilizing the runway, taxiway, or other ground surfaces. Species common in this open grassland area include Canada bluejoint (*Calamagrostis canadensis*), wheatgrass (*Agropyron* spp.), Canada wild rye (*Elymus canadensis*), and Kentucky bluegrass (*Poa pratensis*). Common forbs present included *Chenopodium* species, beach pea (*Lathyrus japonica*), and *Artemisia* species. Occurrences of beachgrass (*Ammophila breviligulata* – state-listed threatened) and beach heather (*Hudsonia tomentosa* – state-listed threatened) were observed in this area (Pomroy-Petry 2000). This open, grassed area is dominated by a combination of native and non-native herbaceous plant species and is not classified as a native plant community following the MNDNR's ECS. The natural communities surrounding the Airport include forested, shrub, and grassland dunes associated with the sandy shores of Lake Superior.

The ecological setting and native plant communities found on sandy shores of Lake Superior are extremely rare in Minnesota and are primarily confined to Minnesota Point. There are several distinct native forested and non-forested plant communities associated with Minnesota Point found in the project area. Forested communities on the Airport include the old-growth forest, which is also found in the SNA and other areas of Minnesota Point. Mature red pine (*Pinus resinosa*) and white pine (*P. strobus*) are the dominant canopy species in the old-growth forest; the understory and ground cover is a mixture of native species. The old-growth trees in the now urban setting are uniquely significant in Minnesota “by virtue of its presence on Lake Superior sand dunes” (Wilson and Rusterholz 1996), with the red and white pine woodland, its understory components, and ecological setting being the only example of this in Minnesota. The MNDNR (2003) classifies this old-growth forest as Red Pine-White Pine Woodland (MNDNR code FDn32b). This red pine and white pine woodland in the SNA is the last natural remnant of a forest that stretched the length of Minnesota Point, which separates the St. Louis River estuary from Lake Superior (MNDNR 2003). Other examples of this plant community nearby or in a similar ecological setting are essentially limited to nearby Wisconsin Point (in Superior, Wisconsin) and on the lee shore of some islands within Wisconsin's Apostle Islands National Lakeshore near Bayfield, Wisconsin (Wilson and Rusterholz 1996).

Other upland forest communities types are less common in the project area including smaller pure stands of native aspen species (*Populus* spp.) where recent disturbances have resulted in second growth forest cover, and planted pine species: jack pine (*P. banksiana*) and Scotch pine (*P. sylvestris*).

Non-forested communities in the project area are primarily associated with the beach dune soils found along the shoreline and in areas on Minnesota Point. Three unique non-forested plant communities found only within the beach dune landscape setting of Minnesota Point are described by MNDNR (2003) as Beachgrass Dune, Juniper Dune Shrubland, and Sand Beach. The Beachgrass Dune (MNDNR code LKu32a) is an open

community characterized by beach dune formations vegetated primarily by a state-listed threatened species of beachgrass (*Ammophila breviligulata*) and other species of herbs and grasses, some of which are endemic to this unique community. The Juniper Dune Shrubland (MNDNR code LKu32b) is also an open dune community found on rolling, partly stabilized sand dunes inland between the beachgrass-dominated dunes and the forested communities. This shrubland has a patchy cover of shrubs, forbs, graminoids, and lichens; juniper (*Juniperus communis*) is the dominant shrub species. The Sand Beach (MNDNR code LKu32c) is a barren or sparsely vegetated community on sand beaches regularly exposed to wave-wash and ice-scouring. Vegetation in Sand Beach communities is typically limited to species associated with Beachgrass Dune and Juniper Dune Shrubland communities, and temporary establishment by opportunistic non-native species.

One other native, non-forested plant community on and in the vicinity of the Airport is Northern Alder Swamp (FPn73a). The Northern Alder Swamp is present as a small (0.69 acre) isolated basin located southeast of the existing runway, outside of the area proposed for construction. This wetland shrub community is typically dominated by dense cover of speckled alder (*Alnus incana*) and with scattered tree species present greater than six (6) feet tall. Shady conditions in Northern Alder Swamp favor understory coverage by shade-tolerant forbs, graminoids, and mosses typical of forested swamp communities in the state.

In June 2013, a survey for sensitive plant species was conducted by an SEH biologist in the area of a potential obstruction light on DAA property, as well as in potential construction access routes in surrounding SNA property. Two state-listed species were encountered in the potential access route during the survey: beach grass and beach heather. Matricary grapefern (*Botrychium matricariifolium*) was observed within the DAA property. Matricary grapefern is not a state-listed species. Although there are previous records of listed *Botrychium* species in this area, the 2013 survey did not encounter occurrences of these species within the survey area.

Invasive species are present on Minnesota Point and have been addressed in previous plans and studies. Of most concern is the presence of European buckthorn (*Rhamnus cathartica*), which was last recorded in 1999 as existing in small, still manageable patches scattered throughout Minnesota Point's forested areas. Garden variety lily-of-the-valley (*Convallaria majalis*) was also documented as a serious concern. Several species of planted pines have also been documented and recommended for removal by the MNDNR where these conflict with the old-growth forest.

3.2.1.2 Habitat and Wildlife

The forest communities, Juniper Dune Shrubland, and Beachgrass Dune communities provide habitat for a wide array of fauna and wildlife. In particular, Minnesota Point has a long history of bird research and hobby bird watching due in large part to its unique geologic setting, formation, and important presence for nesting, foraging, roosting, and resting/stop-over during annual bird migrations. The most recent study (Hawrot and Nicoletti 1999) on bird assemblages and migration related to Minnesota Point, the *Minnesota Point Environmental Management Plan* (LCMR 1999), and city records, document the species observed at Minnesota Point. Several fauna species found in habitats on Minnesota Point or in the vicinity of the project area include state- and/or federally-listed threatened, endangered, special concern species, or are considered Minnesota Species of Greatest Conservation Need. These species and their presence relative to Minnesota Point are described in some detail in **Section 3.2.2**. No known bald eagle nesting areas, waterbird nesting colonies, or other concentrations of wildlife, with or without special designations or protection requirements, are present within or immediately adjacent to the project area.

Breeding bird assemblages present include species that would be expected in mature and intact forest habitat including, but not limited to, the veery (*Catharus fuscescens*) and wood thrush (*Hylocichla mustelina*). The old-growth forest also provides important habitat for common amphibians, mammals, and macroinvertebrates.

On a regional scale, old-growth forest cover is an uncommon habitat type and is considered important for terrestrial wildlife species.

Beach dune and shoreline habitats provide suitable nesting and foraging habitats for shorebirds, including gulls, terns, plovers and sandpipers. Of these birds, the federally-endangered piping plover (*Charadrius melodus*), which is known to occur in the Superior Bay area, is a concern as it has specific habitat requirements. Piping plovers from the Great Lakes population previously nested on sparsely vegetated dredge spoil in the Superior Bay area, but that population has not been observed to breed in the area since approximately the 1980s. Small numbers of piping plovers are still occasionally observed in the Duluth-Superior Harbor area. Gull exclosures have been constructed across the Superior Entry on Wisconsin Point in recent years, in order to attract nesting plovers. Plover tracks (unknown if these were from piping plover or other similar plover species) have been observed in the exclosures, but as yet no nesting has been documented (St. Louis River Alliance 2013). For mammals, the beach dunes provide habitat for small mammals and rodents that prefer open habitats. Beach dunes can also support unique macroinvertebrate assemblages, including tiger beetles.

3.2.1.3 Fisheries

Two important and distinct fisheries are present in the project area. These include the deep, clear, and cold water of Lake Superior, and the shallow and warmer waters of the Duluth and Superior Harbors and the St. Louis River and Bay. Compared to Lake Superior, Superior Bay generally lacks the cold water species found in the lake, and is subject to a greater degree of environmental variation.

Lake Superior's fish community is composed of Salmonids at the top of a relatively linear food chain. Lake trout (*Salvelinus namaycush*) are the top predator of a prey base that is predominantly comprised of Coregonids (whitefish and cisco family). Other species of game fish common to the region are present as well, particularly in the shallower waters located closest to the existing Airport. Species expected to be present in proximity of the Airport would be those that inhabit shallower waters, such as walleye (*Sander vitreus*) and yellow perch (*Perca flavescens*). Species composition is dependent on habitat, which is primarily composed of sandy flats near the Airport.

The warm water fisheries within the Duluth and Superior Harbors and the Superior Bay are composed of walleye, yellow perch, sauger (*Sander canadense*), northern pike (*Esox lucius*), and panfish (Centrarchids). Lake sturgeon (*Acipenser fulvescens* - state-listed special concern) and eastern elliptio (*Elliptio complanata* - state-listed special concern) are present in the bay. There are records of creek heelsplitter (*Lasmigona compressa* - state-listed special concern) in the bay as well. This is in addition to a diverse assemblage of minnow and bait species. The biggest difference from the Lake Superior fishery is the general lack of Salmonid species within the harbors and river, although they are occasionally present. Habitat within the harbors and the bay near the Airport is primarily shallow to deep, sluggish, tannin-stained waters. Bottom composition is soft sediments and sand. Aquatic vegetation, hard substrates, and cover are generally lacking in the immediate project area, but are present elsewhere in the bay and within the St. Louis River and tributary streams.

Non-fish species are also present within Superior Bay, including the potential for aquatic macroinvertebrates and freshwater mussels. To assess the aquatic community that is present within the harbor, five benthic samples were collected. These samples were collected on October 9, 2012, and were collected using a mini-Ekman dredge. Samples were collected along a transect through the footprint of the potential area of impact (**Figure 3-2**). The samples were collected and provided to the University of Wisconsin Superior for identification. **Table 3-1** provides a summary of the results of the sampling.

The sampling indicates a low diversity of macroinvertebrates, and a dominance of midge larvae and aquatic oligochaetes (worms). These are very common species, and often occur in high densities in areas dominated by sand and organic benthic conditions. One sample collected a small amount of *Hexagenia sp.* mayflies, which are also common burrowing species. This sample location has coarser sediments, and was also correlated to an abundance of zebra mussels (*Dreissena polymorpha*). The change in macroinvertebrate composition reflects the change in benthic habitat. This sample location also collected two individual freshwater mussels which were identified as eastern elliptio, a state-listed special concern species. The eastern elliptio is abundant in the harbor, but vulnerable to zebra mussel infestation.

Overall the aquatic macroinvertebrate community in the sampled area is composed of common species that are expected to be present throughout the harbor area.

**Table 3-1
Aquatic Macroinvertebrates Per Square Meter within Alternative 5a Short Project Area**

Taxon	Sample Number					
	#1	#2	#3	#4	#5	#6
<i>Ephemeroptera</i>						
Ephemeridae						
Hexagenia sp.	172					
<i>Diptera</i>						
Chironomidae						
Chironominae						
Chironomini	2,752	860	1,376	5,676	1,032	344
Tanytarsini	8,772	1,376	3,784	37,324	6,536	2,064
Orthoclaadiinae	860			344		
Tanypodinae	516					
<i>Hydrachnida (mites)</i>						
Aquatic mites				172		
<i>Bivalvia</i>						
Dreissenidae	344					
Sphaeriidae	172			172		
Unionidae (large/rare component)	0					
Elliptio complanata ¹	2					
<i>Oligochaeta</i>						
Tubificidae						
Tubificinae	2,580	344		15,308		1,376
Naidinae	3,784	688	3,784	32,852	3,096	2,408
Total Abundance	20,038	3,268	8,944	91,848	10,664	6,192
¹ Two large mussels were collected in a single sample. Large/rare components cannot be extrapolated to determine density per square meter. Value is the total number of specimens collected.						

3.2.1.4 Environmental Consequences (EAW Item 7)

The following before and after land cover descriptions are provided based on the existing condition and the proposed change in land cover based on the preliminary preferred alternative, and any projected changes that could occur under Alternative 13 and the no action alternative (See **Table 3-2**). These data are provided for comparative purposes between the three alternatives considered.

**Table 3-2
Comparative Cover Type Changes per Each Alternative Action**

Preliminary Preferred Alternative – 5a Short						
	Before	After			Before	After
Types 1-8 Wetlands	0.00	0.00		Lawn/Landscaping	15.58	24.26
Wooded/Forest	4.26	4.26		Impervious Surfaces	7.64	5.61
Brush/Grassland	33.88	33.88		Stormwater Pond	0.00	0.00
Cropland	0.00	0.00		Other (Water)	96.04	88.55
				Other (Sandy Beach)	2.03	2.03
				TOTAL¹	159.44	159.44
Alternative 13						
	Before	After			Before	After
Types 1-8 Wetlands	0.59	0.59		Lawn/Landscaping	19.26	24.57
Wooded/Forest	14.98	11.84		Impervious Surfaces	7.64	5.74
Brush/Grassland	30.22	33.36		Stormwater Pond	0.00	0.00
Cropland	0.00	0.00		Other (Water)	79.95	76.55
				Other (Sandy Beach)	3.61	3.61
				TOTAL¹	156.25	156.25
No Action Alternative						
	Before	After			Before	After
Types 1-8 Wetlands	0.00	0.00		Lawn/Landscaping	6.36	6.36
Wooded/Forest	0.00	0.00		Impervious Surfaces	7.65	0.00
Brush/Grassland	0.00	0.00		Stormwater Pond	0.00	0.00
Cropland	0.00	0.00		Other (Public Recreational Land)	0.00	7.65
				TOTAL	14.00	14.00
¹ Acreage of project area includes the construction area plus the area of the approach surface.						

Preliminary Preferred Alternative: Alternative 5a Short

The preliminary preferred alternative (Alternative 5a Short) would avoid land cover changes to the natural terrestrial vegetation surrounding the Airport. This alternative would result in 69,800 cubic yards of fill over 7.49 acres in the harbor [the “Other (Water)” category]. Transport of fill material will follow procedures in MNDNR Operational Order 113 in order to reduce the risk of introduction or spread of invasive species. Some reduction in impervious surface would result due to the shortened runway and taxiway length (2,600 feet compared to the existing 3,050 feet) under this alternative. The area surrounding the Airport facilities, including the runway and taxiway, would be maintained as mowed grass or other low vegetation (see proposed native grass seed mix in **Table 2-2**). This accounts for the approximately 8.68 acres of increased land cover identified as “lawn/landscaping” in **Table 3-2**.

The existing forested habitat on Minnesota Point would remain intact and would not be affected by the preliminary preferred alternative. The construction limits for the project are shown on **Figure 2-1**. The area around the existing runway and taxiway is maintained by mowing and is free of trees and tall shrubs. Although not identified by the MBS with a native plant community code, previous plant surveys (Pomroy-Petry 2000) indicated this area is a mix of low-growing grasses, forbs, and shrubs with occasional bare patches of sandy soil. Records of beach heather (*Hudsonia tomentosa*) and beachgrass (*Ammophila breviligulata*), both state-listed threatened species, have been recorded in the vicinity. The anticipated construction limits for Alternative 5a Short would be restricted to that area on or immediately adjacent to the mowed/maintained areas of the existing runway (see **Figure 2-1**) and outward to Superior Bay, thereby avoiding potential conflicts with potential areas of native plant communities. The impacts would be limited to those areas adjacent to the existing runway that were disturbed during the initial Airport construction. Alternative 5a Short includes approximately 2.2-acres of impact to existing disturbed/non-native grassland areas (included in the “Lawn/Landscaping” cover type). The area that would be disturbed is maintained as mowed turf and has low potential to contain the listed species beachgrass and beach heather. After construction, the balance of land cover on site will be a net gain of 8.68 acres (24.26-acres proposed minus 15.58-acres existing) in the Lawn/Landscaping cover type, as shown in **Table 3-2** above. Locations of plant communities present pre- and post-construction are shown in **Figure 3-1b** and **Figure 3-1c**.

Initially, the preliminary preferred alternative proposed impacts to native habitat due to light vehicle traffic necessary for construction of the southernmost new obstruction light on DAA property as shown on **Figure 2-1**. It would have been necessary for light vehicle traffic to travel through the MNDNR property to access the new obstruction light, potentially disturbing a path 12 feet wide of Juniper Dune Shrubland community in order to access the proposed site. This disturbance would have been temporary. A survey for rare species was completed in this area in 2013. Beach grass and beach heather are present outside the DAA property in the Juniper Dune Shrubland community, and could be directly impacted by construction traffic if the DAA property was accessed from the harbor side. In an effort to avoid impacts to native plant communities, listed species, and potential habitat for piping plover and hairy-necked tiger beetle, the second new obstruction light has been removed from the preliminary preferred alternative. The proposal now includes only one new obstruction light on DAA property in disturbed/non-native grassland habitat. If the second new obstruction light is required for safety reasons, a permit will be sought from the commissioner of the DNR to access the SNA property, and coordination with DNR will take place regarding potential impacts to State listed threatened species. Consultation with USFWS would also take place for potential impacts to the piping plover.

The reconstruction of the runway and the placement of fill within the harbor would affect the warmer water aquatic community and may require mitigation. This fill will reduce the overall habitat for fish and other aquatic species. This is a direct loss of habitat, although the majority of the habitat lost is moderately shallow water depths, with silt and sand bottom, and no submerged or emergent vegetation. As the benthic community is currently composed of common and abundant species, the impacts to wildlife are minimal. Mitigation for the lost habitat may be completed through DAA contributions to projects intended to benefit habitat restoration in the St. Louis River Area of Concern (AOC). Three projects that may provide mitigation opportunities are Allouez Bay vegetation restoration including removal of invasive species and re-establishment of wild rice, Pickle Pond habitat enhancement near Barker’s Island, and Newton Creek/Hog Island ongoing vegetation and habitat restoration. These three projects are located within three miles of the project area, and are planned to help address the past loss of fish and wildlife habitat in the St. Louis River AOC. The proposed action will also utilize riprap to stabilize the shoreline, which will provide a habitat similar to what is present currently. Riprap can provide for a habitat type that may be lacking within the harbor, and is of greater benefit to fisheries than would be provided by a grouted structure, retaining wall, or sheet piling.

In general, the aquatic macroinvertebrate community present in the project area is composed of common and abundant species, which would not be impacted by the project. The exception to this may be the presence of freshwater mussels, which are generally less abundant, and less resilient to recovery from disturbance. The aquatic macroinvertebrate sampling completed by SEH confirmed that eastern elliptio (state-listed special concern) mussels are present within the project area, although not at great abundance. Other mussel species were not collected during the sampling, but may be present. Suitable mussel habitat is present within the project area, and is present throughout the entire St. Louis River estuary. It is assumed that some quantity of mussels would be directly impacted by the project, as would a loss of suitable habitat. The lost habitat, and the quantity of eastern elliptio that would be impacted, are minor in relation to the overall habitat present, and would not have negative impacts on the species.

Correspondence with the MNDNR during preparation of the Draft EA indicated that no additional coordination with the MNDNR will be necessary for the eastern elliptio, other mussel species, or aquatic macroinvertebrates that may be present within the project limits. Mitigation measures for loss of aquatic habitat, if required, will be coordinated with the MNDNR when any authorizations/permits are made for in-water impacts, and with the USACE per any special conditions that may be included in the federal Clean Water Act permit.

The presence of a fishery in the project area also requires a period of no activity within the bed of the lake. This is to ensure that there are no disturbances during the spawning period, where impacts can be aggravated. Within the northeast portion of the state, no work may be completed within a lake between April 1 and June 30. A waiver for work within restriction dates may be sought if necessary to achieve the construction and funding schedule.

Alternative 13

Alternative 13 would result in land cover changes. The construction of Alternative 13 would result in the cutting or topping of 370 trees (295 pines and 76 trees within the SNA), which is more than preliminary preferred alternative. This would affect the old-growth forest and would lessen quality habitat for migratory birds and other fauna. Presumably, if portions of the forest were altered due to cutting, topping, or full removal, management of the remaining area would be in the form of low growing vegetation complementary to the nearby low shrubland community on the edges of the forest. Although this habitat has value for wildlife, it would be a change from the existing forest. Land-side parcel acquisition contiguous with the SNA and with the potential to contribute to the viability and integrity of habitat within the SNA might be considered to compensate for this loss. Development of an enhancement plan for existing DAA forested property could also be considered, to provide consistency with and aid in management of forested SNA property and adjacent forested areas.

The area around the existing runway and taxiway is maintained by mowing and is free of trees and tall shrubs. Although not identified by the MBS with a native plant community code, previous plant surveys (Pomroy-Petry 2000) indicated this area is a mix of low-growing grasses, forbs, and shrubs with occasional bare patches of sandy soil. Records of beach heather (*Hudsonia tomentosa*), a state-listed threatened species, and beachgrass (*Ammophila breviligulata* - state-listed threatened), have been recorded in the vicinity. The anticipated construction limits for Alternative 13 would restrict the construction limits to that area on or immediately adjacent to the mowed/maintained areas of the existing runway (see **Figure 2-10**) and outward to Superior Bay, thereby avoiding potential conflicts with potential areas of native plant communities. The impacts would be limited to those areas adjacent to the existing runway that were disturbed during the initial Airport construction. The area surrounding the Airport facilities, including the runway and taxiway, would be maintained as mowed grass or other low vegetation. This accounts the approximately 5.31 acres of increased land cover identified as “lawn/landscaping” in **Table 3-2**. Changes in impervious surface are based on the

shortened runway and taxiway length associated with this alternative (2,600 feet compared to the existing 3,050 feet).

Initially, Alternative 13 proposed impacts to native habitat due to light vehicle traffic necessary for construction of the southernmost new obstruction light on SWLP property as shown on **Figure 2-12**. It would have been necessary for light vehicle traffic to access the new obstruction light, potentially disturbing a path 12 feet wide of Juniper Dune Shrubland community. This disturbance would have been temporary. A survey for rare species was completed in this area in 2013. Beach grass and beach heather are present outside the DAA property in the Juniper Dune Shrubland community, and could be directly impacted by construction traffic if the DAA property was accessed from the harbor side. In an effort to avoid impacts to native plant communities, listed species, and potential habitat for piping plover and hairy-necked tiger beetle, the second obstruction light has been removed from Alternative 13. The proposal now includes only one new obstruction light on DAA property in disturbed/non-native grassland habitat. If the second new obstruction light is required for safety reasons, coordination with DNR will take place regarding any potential impacts to State listed threatened species. Consultation with USFWS would also take place for potential impacts to the piping plover.

This alternative requires the placement of 24,360 CY of material that will decrease the “Other (Water)” cover type by 3.40 acres within the harbor (see **Table 3-2**), which would affect the warmer water aquatic community and may require mitigation. Transport of fill material will follow procedures in MNDNR Operational Order 113 in order to reduce the risk of introduction or spread of invasive species. This is a smaller volume and area of fill as compared to the preliminary preferred alternative (Alternative 5a Short), which would place approximately 69,800 CY of material over a 7.49 acre area. This fill will reduce the overall habitat for fish and other aquatic species. This is a direct loss of habitat, although the majority of the habitat lost is moderately shallow water depths, with silt and sand bottom, and no submerged or emergent vegetation. As the benthic community is currently composed of common and abundant species, the impacts to wildlife are minimal. Mitigation for the lost habitat may be completed through DAA contributions to projects intended to benefit habitat restoration in the St. Louis River AOC. Three projects that may provide mitigation opportunities are Allouez Bay vegetation restoration including removal of invasive species and re-establishment of wild rice, Pickle Pond habitat enhancement near Barker’s Island, and Newton Creek/Hog Island ongoing vegetation and habitat restoration. These three projects are located within three miles of the proposed action, and are planned to help address the past loss of fish and wildlife habitat in the St. Louis River AOC. Alternative 13 will also utilize riprap to stabilize the shoreline, which will provide a similar habitat to the riprap armored shoreline present currently. Riprap can provide for a habitat type that may be lacking within the harbor, and is of greater benefit to fisheries than would be provided by a grouted structure, retaining wall, or sheet piling.

In general, the aquatic macroinvertebrate community present in the project area is composed of common and abundant species, which would not be impacted by the project. The exception to this may be the presence of freshwater mussels, which are generally less abundant, and less resilient to recovery from disturbance. The aquatic macroinvertebrate sampling completed by SEH confirmed that eastern elliptio (state-listed special concern) mussels are present within the project area, although not at great abundance. Other mussel species were not collected during the sampling, but may be present. Suitable mussel habitat is present within the project area, and is present throughout the entire St. Louis River estuary. It is assumed that some quantity of mussels would be directly impacted by the project, as would a loss of suitable habitat. The lost habitat, and the quantity of eastern elliptio that would be impacted, are minor in relation to the overall habitat present, and would not have negative impacts on the species.

Correspondence with the MNDNR during preparation of the Draft EA indicated that no additional coordination with the MNDNR will be necessary for the eastern elliptio, other mussel species, or aquatic macroinvertebrates that may be present within the project limits. Mitigation measures for loss of aquatic habitat, if required, will be coordinated with the MNDNR when any authorizations/permits are made for in-water impacts, and with the USACE per any special conditions that may be included in the federal Clean Water Act permit.

The presence of a fishery in the project area also requires a period of no activity within the bed of the lake. This is to ensure that there are no disturbances during the spawning period, when impacts can be aggravated. Within the northeast portion of the state, no work may be completed within a lake between April 1 and June 30. A waiver for work within restriction dates may be sought if necessary to achieve the construction and funding schedule.

No Action

The no action alternative would result in ultimate closure of the Airport. Removal of the Airport facilities would not affect the existing fish and wildlife resources on Minnesota Point. It is assumed that impervious surfaces, including the runway and all Airport facilities would be removed and land reclamation would be undertaken. It is unknown what the ultimate land cover at the Airport would be if the Airport were to close. However, it is known that the property would be required to be maintained for public recreational use. For this reason, any area of land cover that would change due to the Airport closure is reflected in the category labeled as “Other (Public Recreational Land)”.

3.2.2 Rare Species Including Federal Threatened and Endangered Species (EAW Item 13.b.)

EAW Item 13.b. Rare species. Describe rare features such as state-listed (endangered, threatened or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-614) and/or correspondence number (ERDB _____) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

3.2.2.1 Rare Species

A search of the MNDNR Natural Heritage Information System (NHIS) database was performed to identify known occurrences of rare plant and animal species on and around the existing airport. The most recent data available from the NHIS in 2012 identifies 37 known occurrences of rare species, native plant communities, or ecological features within a one-mile radius of the existing airport or within Minnesota Point. The species that were identified within one-mile of the Airport or within habitat on Minnesota Point are summarized in **Table 3-3**. Beach dune and shoreline habitats provide suitable nesting and foraging habitats for shorebirds, including gulls, terns, plovers and sandpipers. Of these birds, the federally-endangered piping plover (*Charadrius melodus*), which is known to occur in the Superior Bay area, is a concern as it has specific habitat requirements. Piping plovers from the Great Lakes population previously nested on sparsely vegetated dredge spoil in the Superior Bay area, but that population has not been observed to breed in the area since approximately the 1980s. Small numbers of piping plovers are still occasionally observed in the Duluth-Superior Harbor area. Gull enclosures have been constructed across the Superior Entry on Wisconsin Point in recent years, in order to attract nesting plovers. Plover tracks (unknown if these were from piping plover or other similar plover species) have been observed in the enclosures, but as yet no nesting has been documented (St. Louis River Alliance 2013).

**Table 3-3
Rare Species/Ecological Features within One-Mile
of Existing Airport or within Habitat on Minnesota Point**

Common Name	Scientific Name	Resource Type	Number of Records	Protection Status
Piping plover	<i>Charadrius melodus</i>	Bird	6	Federally-listed Endangered State-listed Endangered
Common tern	<i>Sterna hirundo</i>	Bird	4	State-listed Threatened
Lake sturgeon	<i>Acipenser fulvescens</i>	Fish	1	State-listed Special Concern
Hairy necked tiger beetle	<i>Cincidela hirticollis rhodensis</i>	Insect	5	State-listed Endangered
Eastern pipistrelle	<i>Pipestrellus subflavus</i>	Mammal	1	State-listed Special Concern
Eastern elliptio ¹	<i>Elliptio complanata</i>	Mussel	2	State-listed Special Concern
Beach grass	<i>Ammophila breviligulata</i>	Plant	2	State-listed Threatened
Bur marigold	<i>Bidens discoidea</i>	Plant	1	State-listed Special Concern
Pointed moonwort	<i>Botrychium acuminatum</i>	Plant	1	State-listed Special Concern
Matricary grapefern	<i>Botrychium matricariifolium</i>	Plant	2	Non-status
Michigan grapefern	<i>Botrychium michiganense</i>	Plant	1	Non-status
Pale moonwort	<i>Botrychium pallidum</i>	Plant	1	State-listed Special Concern
St. Lawrence grapefern	<i>Botrychium rugulosum</i>	Plant	1	State-listed Threatened
Least moonwort	<i>Botrychium simplex</i>	Plant	1	State-listed Special Concern
Slender hairgrass	<i>Deschampsia flexuosa</i>	Plant	1	State-listed Threatened
Beach heather	<i>Hudsonia tomentosa</i>	Plant	4	State-listed Threatened
Clustered bur-reed	<i>Sparganium glomeratum</i>	Plant	2	Non-status
Lake and wetland deposition (quaternary)	N/A	Ecological feature	1	N/A
Native plant community, undetermined class (red pine forest)	N/A	Ecological feature	1	Scientific and Natural Area (SNA) and Minnesota Land Trust
Sand beach (Lake Superior) Type	N/A	Ecological feature	1	N/A

Notes:

A species is considered federally endangered if the species is threatened with extinction throughout all or a significant portion of its range within the United States for species listed under the federal Endangered Species Act.

A species is considered endangered in Minnesota if the species is threatened with extinction throughout all or a significant portion of its range within Minnesota for species listed under the Minnesota Endangered Species Statute.

A species is considered threatened in Minnesota if the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range within Minnesota for species listed under the Minnesota Endangered Species Statute.

Table 3-3 (Continued)
Rare Species/Ecological Features within One-Mile
of Existing Airport or within Habitat on Minnesota Point

Notes:

A species is considered a species of special concern in Minnesota if, although the species is not endangered or threatened, it is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range that are not listed as threatened may be included in this category along with those species that were once threatened or endangered but now have increasing or protected, stable populations; for species listed under the Minnesota Endangered Species Statute.

N/A or Not Applicable is assigned to ecological features that do not have scientific names or have state or federal protection status.

Non-status implies that the species does not have any state protection status, but the species or its habitat are tracked by the MNDNR, and/or the species could be a candidate for state listing in the future.

¹ Occurrence of eastern elliptio was documented in the benthos survey conducted in 2012; the record was not retrieved from the NHIS database.

3.2.2.2 Old-growth Pine Forest

The mixed aged pine forest is found on stabilized sand dunes (MNDNR 2003), which are a function of the strong lakeside winds that created and maintain the sand dunes on the point. The sand spit itself was probably formed about 5,000 years ago and is one of the “newest” (geologically speaking) examples of this type of feature in the bay. The sand spit began forming as beach drifting sand was transported by wave action from the south shore of the lake (Wisconsin side) and was then deposited on the north shore (Minnesota side) (Wilson and Rusterholz 1996). This approximately 10-mile spit of land ultimately dammed the St. Louis River, which accounts for the relatively safe inland port in Duluth-Superior (Ojakangas and Match 1982).

The uniqueness of the forest stand and its location on Minnesota Point are key factors as to how this resource contributes to Minnesota’s natural heritage. The red and white pine woodland in the SNA is the last natural remnant of a forest that stretched the length of Minnesota Point, which separates the St. Louis River estuary from Lake Superior (MNDNR 2003). Classification of trees in the SNA forest as meeting the “old-growth” criteria set forth by the MNDNR requires that a natural forest has developed over a long period of time, generally at least 120 years, without experiencing severe, stand-replacing disturbance (e.g., fire, windstorm, or logging). The old-growth trees in the now urban setting are uniquely significant in Minnesota “by virtue of its presence on Lake Superior sand dunes” (Wilson and Rusterholz 1996), with the red and white pine woodland, its understory components, and ecological setting being the only example of this in Minnesota. The MNDNR has mapped this plant community in its Ecological Classification System (ECS) as “Red Pine-White Pine Woodland” (ECS code FDN32b). Other examples of this plant community nearby or in a similar ecological setting are essentially limited to nearby Wisconsin Point (in Superior, Wisconsin) and on the lee shore of some islands within Wisconsin’s Apostle Islands National Lakeshore near Bayfield, Wisconsin (Wilson and Rusterholz 1996).

The distribution of the red and white pine stands are a function of natural ecological processes that formed and maintained the sandbar on Minnesota Point. Red pines tend to be distributed on the drier dunes lakeside, whereas white pines tend to be found along the lee side of the dunes along a slightly more mesic saltation platform (Wilson and Rusterholz 1996). [Saltation refers to the “particle movement in water or wind where particles skip or bounce along the stream bed or soil surface” (Brady and Weil 1998).] The uneven aged stand of trees is unusual, particularly for red pine that tend to regenerate shortly after fire, and is likely a component of the sandy substrate. The assessment completed by Wilson and Rusterholz (1996) further surmised that the stand “will require little management to maintain the pine components of the stand well into the future.” This appears true today due to the fact that the site has had a history of human disturbance, but the pine stands

persist. The presence of paper birch (*Betula papyrifera*) within the canopy gaps is likely due to human disturbance in the last century (e.g., selective harvest or settling activities associated with buildings or their abandonment). Finally, Wilson and Rusterholz (1996) surmised that the birch component in the pine stand could be reaching the end of its life expectancy.

The 1996 assessment completed by Wilson and Rusterholz (1996) included age, diameter, and quantity measurements for trees in the SNA. A total of 166 trees within the SNA were inventoried in 1996: 79 white pine, 75 red pine, and 12 paper birch. For age estimates, increment cores from 17 red pines and six white pines representative of typical canopy trees were completed. For 14 of the 17 red pines, ages in 1996 were estimated from about 101 to 143 years old; in 2009, these age estimates would be between 114 and 156 years old. Three even older red pines were discovered in the assessment with two aged at 197 years and one aged at 175 years old. In 2009 this would make these three older trees approximately 210 and 188 years old, respectively. For the six white pines evaluated during the 1996 assessment, tree age was estimated between 100 and 130 years; in 2009 these white pines would be between 113 and 143 years old. For these oldest trees evaluated, diameters of red pine ranged between 20.8 and 50.9 cm (~8 to 20 in) and white pines ranged between 32.6 and 51.1 cm (~13 to 20 in).

3.2.2.3 Minnesota Point Pine Forest Scientific and Natural Area (SNA)

The Minnesota Point Pine Forest SNA was established in April 2002 to preserve and protect the old-growth red and white pine forest remnant that once extended along the length of Minnesota Point, as well as the associated sand dunes and lakeshore that make up one of the largest baymouth sandbars in the world (Ojakangas and Matsch 1982). Minnesota Administrative Rules (Chapter 6136) provides for “creation and establishment of scientific and natural areas for the purpose of preserving, protecting, and managing lands or waters possessing inherent natural values, including soils, waters, or sediments, sites of scientific value, habitats of rare or endangered species of plants and animals, places of historic or prehistoric interest and scenic beauty, and areas uniquely suitable for teaching natural history and conservation.” These areas are managed and protected by the MNDNR to preserve their natural features and rare resources of exceptional scientific and educational value.

Prior to establishment of the SNA, a Conservation Easement was established on the property on June 30, 1999 between the Minnesota Land Trust and the State of Minnesota. As the previous owners of the property, the Minnesota Land Trust recognized the value of the natural, ecological, and aesthetic features of the property, and established a conservation easement with the State of Minnesota to serve the policies of the State of Minnesota that encourage the protection of Minnesota’s natural resources as set forth in part in Minnesota Statutes Section 84C.01-02 (Conservation Easements), as well as Section 86A.05 and Section 84.033 (State Scientific and Natural Areas) to conserve and preserve it in perpetuity.

3.2.2.4 Tree Height Survey

In response to potential effects on the forest due to airport safety improvements, a tree height survey began in 2005. Supplemental surveys were conducted in 2008, 2009, and 2010. These tree height surveys were used to identify trees growing into the approach surface. Trees were identified to species and surveyed for height from their basal trunk area. The tree survey mapped and measured 2,431 trees within the approximately 18.5-acre study area. The study area was comprised of property owned by the DAA, MNDNR, and SWLP. Of the 2,431 trees surveyed, 922 (516 pines) were on DAA property, 1,392 trees (1,155 pines) were on MNDNR property, and 117 (85 pines) were located in SWLP property. Trees throughout the study area were surveyed for location and height. Summary data (**Table 1** in **Appendix C**) shows tree heights in 2010. For trees that were surveyed prior to 2010, a tree growth model was applied to estimate tree heights in 2010. These data also provide long-term (50-year) projections of tree heights and potential future obstructions to the approach surface of the runway. The development, methodology, and results of the growth model are described in detail

in **Appendix C**. Subsequent refinement of the tree survey was conducted for a small area of quaking aspen trees on MNDNR property in 2012. This additional study is described in **Section 3.2.2.4** below.

Table 3-4 shows the distribution of trees per species throughout three height classes, and shows the average height of trees within each height class as well as the tallest individual in that height class. Red pine is the most abundant species with 1,059 individuals, while 697 individuals were white pine. Several hardwoods were also abundant, although most likely not considered dominant, and included paper birch (291 individuals), balsam poplar (251 individuals), and quaking aspen (46 individuals). Nineteen other species (for a total of 87 additional trees) were observed throughout the study area; none of these species had more than 17 individuals observed. Most (48.3%) of the trees fit in the 30- to 60-foot height class, with 37.5% of trees greater than 60 ft and 14.2% less than 30 ft tall. The tallest tree surveyed was a 101-foot tall white pine. Of the ten tallest trees, five were white pine (92.5, 93.3, 93.5, 93.7, and 101.0 feet) and five were red pine (94.6, 95.8, 96.8, 97.0, and 97.8 feet).

**Table 3-4
Summary of Trees**

Species and Height Class (ft)	Property Ownership (# of Trees)				2010 Tree Height ¹ (ft)	
	DAA	MNDNR	SWLP	Total	Average	Maximum
<i>Betula papyrifera</i> (Paper Birch)						
0-30	28	15	0	43	25.0	29.9
30-60	72	123	15	210	43.8	59.9
60+	11	22	5	38	67.7	78.8
Subtotal	111	160	20	291	44.2	78.8
<i>Pinus resinosa</i> (Red Pine)						
0-30	6	44	1	51	26.8	29.9
30-60	126	302	41	469	45.6	59.7
60+	172	353	14	539	72.7	97.8
Subtotal	304	699	56	1059	58.5	97.8
<i>Pinus strobus</i> (White Pine)						
0-30	5	41	2	48	26.7	29.8
30-60	78	219	23	320	46.7	59.8
60+	129	196	4	329	73.2	101.0
Subtotal	212	456	29	697	57.8	101.0
<i>Populus balsamifera</i> (Balsam Poplar)						
0-30	190	0	0	190	24.8	29.9
30-60	52	7	1	60	34.3	50.5
60+	0	0	1	1	69.8	69.8
Subtotal	242	7	2	251	27.3	69.8
<i>Populus tremuloides</i> (Quaking Aspen)						
0-30	0	0	0	0	0	0
30-60	5	38	2	45	48.5	59.4
60+	0	0	1	1	70.8	70.8
Subtotal	5	38	3	46	49.0	70.8
Other Tree Species²						
0-30	8	5	1	14	25.4	29.3
30-60	38	26	6	70	40.2	59.0
60+	2	1	0	3	66.4	73.0
Total	48	32	7	87	38.7	73.0
Grand Total (trees)	922	1392	117	2431	52.5	101.0
¹ Tree heights shown for 2010 are calculated using an aggressive growth model (Appendix C) for those trees surveyed prior to 2010. ² Nineteen other tree species were observed within the study area. Each of these species has fewer than 17 individuals and is considered non-dominant.						

3.2.2.5 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Construction limits (see **Figure 2-1**), including equipment storage and construction staging areas, will be completely within areas previously disturbed. Impacts to native habitats surrounding the existing runway will be avoided to the greatest extent possible by keeping construction activities on or within the existing disturbed, maintained, and mowed areas that contain the runway and taxiway.

The preliminary preferred alternative would involve construction in several habitats for rare species listed in the MNDNR NHIS Database or documented in the 2012 benthos survey (see results in **Table 3-1**): aquatic habitat within the harbor and disturbed areas adjacent to the existing runway. A small area of construction was previously proposed for installation of an obstruction light in native plant communities (as described in **Section 2.1**). The obstruction light would have been installed on DAA property, but it would be necessary to access the site for construction through SNA property. Vehicles accessing the site would potentially disturb a path 12 feet wide of Juniper Dune Shrubland community in order to access the proposed site of the new obstruction light. This work would have had a permanent footprint of about 36 square feet within the DAA property, and could have temporary construction impacts to habitat suitable for the moonworts, beachgrass, and beach heather, as well as other faunal species including the common tern, hairy-necked tiger beetle, and eastern pipistrelle.

The NHIS Database also identifies endangered piping plover as occurring within one mile of the project area. Piping plovers from the Great Lakes population previously nested on sparsely vegetated dredge spoil in the Superior Bay area, but that population has not been observed to breed in the area since approximately the 1980s. Small numbers of piping plovers are still occasionally observed in the Duluth-Superior Harbor area. Gull exclosures have been constructed in recent years on the bay side of Wisconsin Point and Shafer Beach (on the Lake Superior side of Wisconsin) in order to attract nesting plovers. Plover tracks (unknown if these were from piping plover or other similar plover species) have been observed in the exclosures, but as yet no nesting of piping plover has been documented (St. Louis River Alliance 2013). No such exclosures have been constructed on the Minnesota Point side, and Alternative 5a Short is unlikely to impact breeding populations of piping plover. Due to potential for impacts to listed species as described above, as well as impacts to other resources, the southernmost obstruction light has been eliminated from the plan for the preliminary preferred alternative. Construction of all other portions of the project will avoid habitat for terrestrial listed species. Therefore, this action is anticipated to have no effect on the piping plover. If the second (southernmost) new obstruction light is ultimately required for safety reasons, a permit will be sought from the commissioner of the DNR in addition to permission from Minnesota Land Trust to access the SNA property, and coordination with DNR will take place regarding potential impacts to State listed threatened species. Consultation with USFWS would also take place for potential impacts to the piping plover.

Fill in the harbor would affect habitat for lake sturgeon, creek heelsplitter, and eastern elliptio. The impacted habitat is common in the harbor, and no additional coordination is anticipated to be necessary for any mussel species. Area impacted by fill in the harbor is not likely to be good spawning habitat, due to the soft/silty substrate and lack of emergent or submergent vegetation; therefore, impact to spawning habitat should be negligible. Construction in the beach environments could affect habitat suitable for beach heather and beachgrass, as well as the hairy-necked tiger beetle. Minnesota Point and the St. Louis River Estuary represent the western periphery of the beetle's range. The beetles were previously documented on Minnesota Point and Port Terminal on Rice's Point (Coffin and Pfanmuller, eds. 1988), but the Rice's Point population was not identified in the 2003 surveys. Preferred habitat for hairy-necked tiger beetle is sandy shorelines of the Great Lakes. Construction of Alternative 5a Short is planned to avoid sandy beach areas that may provide habitat for hairy-necked tiger beetle. Construction access to the previously proposed southernmost obstruction light in DAA property surrounded by the SNA would have temporary impacts to Juniper Dune Shrubland, a

unique native plant community. Two additional non-state listed species of moonworts were listed in the NHIS Database: matricary grapefern and Michigan grapefern, which could also be affected by construction in this area; however, in order to avoid impacts to native plant communities and potential habitat for listed species, the southernmost new obstruction light has been eliminated from the plan for the preliminary preferred alternative.

The tree survey and the subsequent tree growth model initially projected that nine quaking aspen trees would penetrate the approach surface in the long-term (50 years). This means that by year 2063, it was estimated that these nine trees would then be tall enough to become obstructions under the preliminary preferred alternative. While this small stand of quaking aspens was a part of the initial tree height survey, the intent of the initial tree survey was to concentrate primarily on collecting data for red and white pines. This stand of quaking aspens was surveyed as a group (i.e., a single clone), and the height of the tallest tree in the group was assigned to each tree in the clone. Each of the trees within this clone was re-surveyed in October 2012 in order to verify individual tree heights. The result showed trees with heights ranging from 23 to 39 feet, instead of the 46 feet assigned to the entire stand. It is possible the 46-ft tree was topped due to windthrow, as several large quaking aspen trunks were observed topped/felled and deceased during the 2012 re-survey. Reapplying the growth model to the heights of individual trees in this aspen clone resulted in no penetrations to the approach surface under the preliminary preferred alternative by year 2063.

Alternative 13

Construction limits for Alternative 13 are shown in **Figure 2-2**. Alternative 13 would involve construction in several habitats for rare species listed in the MNDNR NHIS Database or documented in the 2012 benthos survey (see results in **Table 3-1**): aquatic habitat within the harbor and disturbed areas adjacent to the existing runway. A small area of construction was previously proposed for installation of an obstruction light in native plant communities (as described in **Section 2.3.1.2**). The obstruction light would have been installed on SWLP property, and it would be necessary to access the site for construction through areas of native plant communities. Vehicles accessing the site would potentially disturb a path 12 feet wide of Juniper Dune Shrubland community in order to access the proposed site of the new obstruction light. The light itself would have had a permanent footprint of about 36 square feet, and could also have temporary construction impacts to habitat suitable for the moonworts/grapeferns, beachgrass, and beach heather, as well as other faunal species including the common tern, hairy-necked tiger beetle, and eastern pipistrelle. The NHIS Database also identifies endangered piping plover as occurring within one mile of the project area. Piping plovers from the Great Lakes population previously nested on sparsely vegetated dredge spoil in the Superior Bay area, but that population has not been observed to breed in the area since approximately the 1980s. Small numbers of piping plovers are still occasionally observed in the Duluth-Superior Harbor area. Gull exclosures have been constructed in recent years on the bay side of Wisconsin Point and Shafer Beach (on the Lake Superior side of Wisconsin) in order to attract nesting plovers. Plover tracks (unknown if these were from piping plover or other similar plover species) have been observed in the exclosures, but as yet no nesting of piping plover has been documented (St. Louis River Alliance 2013). No such exclosures have been constructed on the Minnesota Point side, and Alternative 13 is unlikely to impact breeding populations of piping plover. Due to potential for impacts to listed species as described above, as well as impacts to other resources, the southernmost obstruction light has been eliminated from the plan for Alternative 13. Therefore, this action is anticipated to have no effect on the piping plover.

Fill in the harbor would affect habitat for lake sturgeon, creek heelsplitter, and eastern elliptio. The impacted habitat is common in the harbor, and no additional coordination is anticipated to be necessary for any mussel species. Area impacted by fill in the harbor is not likely to be good spawning habitat, due to the soft/silty substrate and lack of emergent or submergent vegetation; therefore, impact to spawning habitat should be negligible. Construction in the beach environments could affect habitat suitable for beach-heather and beachgrass, as well as the hairy-necked tiger beetle. Minnesota Point and the St. Louis River Estuary represent the western periphery of the beetle's range. The beetles were previously documented on Minnesota Point and Port Terminal on Rice's Point (Coffin and Pfannmuller, eds 1988), but the Rice's Point population was not relocated in 2003 surveys. Preferred habitat for hairy-necked tiger beetle is sandy shorelines of the Great Lakes. Construction of Alternative 13 is planned to avoid sandy beach areas that may provide habitat for hairy-necked tiger beetle. Beach-heather has been recorded within the Alternative 13 construction area. Construction in sandy, forested areas could affect habitat for four listed species of moonworts including pale moonwort, St. Lawrence grapefern, pointed moonwort, and least moonwort. Two additional non-state listed species of moonworts were listed in the NHIS Database: matricary grapefern and Michigan grapefern. The construction of Alternative 13 would result in the cutting or topping of 370 trees (295 pines and 76 trees within the SNA) by 2063. This would affect the old-growth forest and would lessen quality habitat for migratory birds and other fauna. Cutting or topping of trees would likely convert a portion of the forest to a more open setting succeeding to Juniper Dune Shrubland. Although this habitat has value for wildlife, it would be a change from the existing forest in a portion nearest the runway.

The tree survey and the subsequent tree growth model projected the number of trees that would penetrate the approach surface in the long-term (50 years). By year 2063, it is estimated that 370 trees would penetrate the approach surface under Alternative 13.

There are several potential mitigation opportunities for impacts to sensitive habitat of rare species. Impacts to the SNA under Alternative 13 are greater than impacts to the SNA under the preliminary preferred alternative. Mitigation options are similar under both alternatives, but would be greater in scale under Alternative 13 in order to adequately mitigate for larger impacts. Potential options include replanting of rare species in protected areas, and land swap or a donation of existing airport property with additional rare species that is no longer needed for aeronautical purposes due to the relocated approach surface. This land would add contiguous habitat and would expand the size of the existing SNA. Other options that might be considered would be fees paid to permitting agencies in-lieu of specific mitigation actions on the site. Rather, these fees could be used for research on the ecological community and/or for dedicated management, enhancement, or restorative measures to protect the long-term integrity and viability of the SNA and unique biological resources surrounding and contiguous with the SNA. Potential mitigation opportunities will be developed in more detail and established at the permitting phase.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. The existing airport, although publicly open, would be re-dedicated to public recreational use with aviation use restrictions removed. It is unknown what type of potential ecological restoration might follow the re-dedication for public recreational use. Because the exact nature of the public recreational use of the area is not known, it is unknown what effect the no action alternative would have on the old-growth pine forest, the SNA, or any of the other habitats with ecological significance nearby.

3.3 Coastal Resources

Federal activities involving or affecting coastal resources are governed by the Coastal Barriers Resources Act (CBRA) of 1982, the Coastal Zone Management Act (CZMA) of 1972, and Executive Order (E.O.) 13089, Coral Reef Protection. The CBRA prohibits federal funding for new development within the Coastal Barriers

Resources System (CBRS), which consists of undeveloped coastal barriers along the Atlantic and Gulf coasts and the shores of the Great Lakes. Federal agencies are required to consult with the USFWS prior to committing funds for project or actions within the CBRS. Minnesota Point, including the Airport, is within the CBRS.

The CZMA applies to states having an approved Coastal Zone Management (CZM) plan. The CZM plan is implemented by a designated state or local agency and proposed federal actions within the CZM boundary must work to achieve consistency with the applicable CZM plan. The CZM plan typically compliments and implements relevant and applicable federal, state, and local regulations, policies and management plans to achieve the goals and intent of the CZMA. In Minnesota, the CZM is implemented through Minnesota's Lake Superior Coastal Program (MLSCP), a federal-state partnership dedicated to comprehensive planning and management within the designated Coastal Boundary of Lake Superior. MLSCP is administered by the MNDNR and encourages greater cooperation, simplifies governmental processes, and provides tools for implementing existing policies, authorities, and programs within the Coastal Boundary shown on **Figure 3-3**. The Airport is located entirely within the Coastal Boundary with the City of Duluth as the local unit of government.

Executive Order (EO) 13089, Coral Reef Protection, established the United States Coral Reef Task Force to lead U.S. efforts to preserve and protect coral reef ecosystems. EO 13089 directs federal agencies to ensure, to the extent practicable, that actions authorized, funded, or carried out do not degrade these ecosystems. No coral reefs are present in the project area, at Minnesota Point, or at any other location in Lake Superior or the St. Louis River.

3.3.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

The preliminary preferred alternative would require 7.49 acres of fill in Superior Bay and would impact the CBRS and the Coastal Zone. The FAA received concurrence from the USFWS on July 12, 2013 that the project complies with the purposes of the CBRA and that a Section 6 exception (the maintenance, replacement, reconstruction or repair of publicly owned or publicly operated roads, structures, or facilities that are essential links in a larger network or system) under CBRA (16 U.S.C. § 3505) is applicable (see **Appendix E**). As a part of the CZMA, the FAA has submitted a Federal Consistency Determination to the MNDNR for their concurrence that the project is consistent with the MLSCP. Any required mitigation measures resulting from the coordination with the MNDNR will be included in the Final EA.

No coral reefs are present in the project area, at Minnesota Point, or at any other location in Lake Superior or the St. Louis River. Therefore, the project will have no effect on coral reef ecosystems and is compliant with EO 13089.

Alternative 13

Alternative 13 would require 3.40 acres of fill in Superior Bay and would impact the CBRS and the Coastal Zone. The FAA will consult with the USFWS to determine if the Section 6 exception (the maintenance, replacement, reconstruction or repair of publicly owned or publicly operated roads, structures, or facilities that are essential links in a larger network or system) under CBRA (16 U.S.C. § 3505) is applicable. If alternative 13 is implemented, as a part of the CZMA, the FAA will submit a Federal Consistency Determination to the MNDNR for their concurrence that the project is consistent with the MLSCP.

No coral reefs are present in the project area, at Minnesota Point, or at any other location in Lake Superior or the St. Louis River. Therefore, the project will have no effect on coral reef ecosystems and is compliant with EO 13089.

No Action

The no action alternative would result in loss of Airport licensure and closure and removal of the facility. The no action alternative would not negatively impact any of the coastal resources. Removal of Airport facilities would reduce impervious surface on the site, a potential beneficial impact to coastal resources. The future use of the site would be a public recreational area. It is not known what land use would be associated with this recreational area, and whether there would be additional impervious surface or other impacts to coastal resources.

3.4 Compatible Land Use (EAW Item 9.b.)

EAW Item 9.b. Land use. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

3.4.1 Current and Past Land Use

The Airport is located within the City of Duluth on Minnesota Point (see **Figure 1-1**). Land uses surrounding the Airport and on Minnesota Point includes mixed developed and undeveloped parcels as shown in **Figure 3-4**. Undeveloped parcels are comprised of forest cover, wetlands, or beach dunes. Scattered low density residential parcels are found in the vicinity of the Airport with higher density residential areas occurring approximately one mile to the west (towards downtown Duluth) on Minnesota Point. Small commercial/retail and light industry parcels are also scattered within the residential and developed sections of Minnesota Point, especially towards the west where development density increases. Minnesota Point Pine Forest SNA is located adjacent to and southeast of the Airport on Minnesota Point (see **Section 3.2.2.3**). To the northwest of the Airport is Park Point Recreation Area. The nearest schools are located five (5) miles from the Airport in downtown Duluth and 1.5 miles from the Airport across Superior Bay in Superior, Wisconsin.

Aviation use on Minnesota Point began in 1931 with a lease agreement between the Duluth Boat Club and Northwest Airways, Inc. The Duluth-Sky Harbor Airport was created by Minnesota Law in 1969 and the Airport has operated in its current location since that time.

The compatibility of existing and planned land uses in the vicinity of an airport is typically associated with either noise impacts related to airport operations or land use planning, but can also be associated with other issues such as wildlife hazards (**Section 3.4.2**) and protection of approach surfaces (**Section 3.4.3**). See **Section 3.14** for a description of existing noise levels on and around the Airport and a description of potential noise impacts resulting from each alternative.

The Park Point Recreation Area hosts an annual art festival in the park which creates an assembly of people within Zone A of the Sky Harbor Airport Zoning Ordinance (See **Section 3.4.3.3**). The Minnesota Point Pine Forest SNA located in the approach to Runway 32 is currently an incompatible use since the tree heights penetrate the Approach Surface to Runway 32. In addition, the trees, due to their elevation, violate the Airport Overlay (A-O) Zoning Ordinance since they penetrate the approach surface. No other areas of assembly or other incompatible land uses are located in the immediate vicinity of the Airport.

3.4.1.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Implementation of the preliminary preferred alternative would not result in development of incompatible or noise-sensitive land uses. The preliminary preferred alternative would not directly result in any change in the number of aircraft operations or the type of aircraft using the Airport, therefore, no changes in noise impacts outside of the Airport boundary would be expected. Any future growth in aircraft operations would not be a direct result of the preliminary preferred alternative and operations would be expected to remain at levels that would not increase noise impacts off of airport property (see **Section 3.14**).

No adverse impacts to area recreational uses would result from the preliminary preferred alternative.

Alternative 13

Similar to the preliminary preferred alternative, Alternative 13 would not result in development of incompatible or noise-sensitive land uses. Alternative 13 would not directly result in any change in the number of aircraft operations or the type of aircraft using the Airport, therefore, no changes in noise impacts outside the Airport boundary would be expected. Any future growth in aircraft operations would not be a direct result of Alternative 13 and operations would be expected to remain at levels that would not increase noise impacts off of airport property (see **Section 3.14**).

No Action

The no action alternative would result in loss of Airport licensure and closure of the Airport. The Airport site would be reclaimed and would be required to be used for other public recreational and public health purposes as described in **Section 2.2**. It is not anticipated that the use of this site for other recreational purposes would be an incompatible land use.

3.4.2 Hazardous Wildlife Attractants

FAA AC 150/5300-33A, *Hazardous Wildlife Attractants on or near Airports*, provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public use airports. The guidance also addresses coordination and implementation of approaches to reduce wildlife hazards for airport expansion projects during construction and subsequent operations.

Potential wildlife hazards present in the project area include the presence of open water (Lake Superior and Superior Bay), sandy beach, grass- and shrub-land, and the forested areas. The open water areas provide potential habitat for waterfowl. The Airport reports instances of gulls and Canada geese on and in the vicinity of the Airport. In addition, deer are occasionally sighted at the Airport. The DAA holds a depredation permit for lethal and non-lethal actions for deer and waterfowl and reports using both methods several times per week during seasons of high waterfowl activity. The only reported wildlife strike at the Airport occurred in 2007 and involved a Canada goose.

3.4.2.1 Environmental Consequences

Initial Consultation with the United States Department of Agriculture Wildlife Services (USDA) is included in **Appendix F**. The USDA indicated in this initial consultation that the alternatives are unlikely to increase the wildlife hazards present at the Airport.

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short is not expected to increase the potential for wildlife hazards at the Airport. Management and treatment of surface water runoff would be necessary to protect downstream receiving waters. Runoff management would be limited to the use of grassed swales, overland flow, and other best management practices (BMPs) that avoid creation of standing water or other attractants to hazardous wildlife. However, as indicated during Initial Consultation with USDA, water birds such as gulls could pose a hazard during periods of construction as dredging operations may attract these species. The Airport will continue to utilize the existing wildlife management techniques during construction. Should wildlife hazards increase during construction or existing management techniques become ineffective, the Airport will increase use of wildlife management techniques (non-lethal and lethal measures) as necessary. In addition, the Airport will be closed during periods of the construction process as described in **Section 2.1**.

Alternative 13

Similar to the preliminary preferred alternative, Alternative 13 is not expected to increase the potential for wildlife hazards at the Airport. Runoff management would be limited to the use of grassed swales, overland flow, and other best management practices that avoid creation of standing water or other attractants to hazardous wildlife. The Airport will continue to utilize the current wildlife management techniques during construction. Should wildlife hazards increase during construction or existing management techniques become ineffective, the Airport will increase use of wildlife management techniques (non-lethal and lethal measures) as necessary.

No Action

The no action alternative would not impact wildlife hazards at the Airport. Once Airport licensure is revoked and the Airport is closed, the potential wildlife hazards present in the Airport area will no longer be a hazard to aviation.

3.4.3 Land Use Planning and Zoning (*EAW Item 9.a.i., Item 9.a.ii., and Item 9.a.iii.*)

EAW Item 9.a. Describe: i. Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands. ii. Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency. iii. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

3.4.3.1 City of Duluth

Properties on Minnesota Point are included in the Unified Development Chapter of the Duluth Legislative Code (UDC) and the City of Duluth 2006 Comprehensive Land Use Plan. Currently, the Airport and surrounding areas of Minnesota Point are zoned Residential Traditional (R-1) as shown in **Figure 3-5**. This district allows traditional neighborhoods of single-family residences, duplexes and townhomes on moderately sized lots.

The Comprehensive Plan identifies the area northwest and adjacent to the Airport on Minnesota Point as “recreational” (Park Point Recreation Area and Hartman Park). Further northwest towards downtown Duluth on Minnesota Point the land use is both “preservation” and “residential” as shown in **Figure 3-5**. North and southeast of the Airport the land use is primarily “preservation” with the land use at the Airport and the end of Minnesota Point being “Transportation and Utilities”.

The City of Duluth has recognized that the zoning on Minnesota Point including the Airport is not consistent with the Comprehensive Land Use Plan. As such, the entire Minnesota Point has been identified as an area to be studied as part of a city-wide rezoning process. The City of Duluth has decided to delay this rezoning of the Airport and the surrounding area until this EA process is complete since the outcome could change the desired zoning of the Airport land and the neighboring parkland.

3.4.3.2 City of Superior Zoning

The area west of the Airport, across Superior Bay, is included in the City of Superior, Wisconsin Zoning Ordinance, which is governed by the City of Superior Municipal Code, Chapter 122. The existing Superior Zoning is shown on **Figure 3-6**. The area along the shore of Superior Bay is zoned Waterfront (W-1) while the areas further southwest are zoned for residential uses.

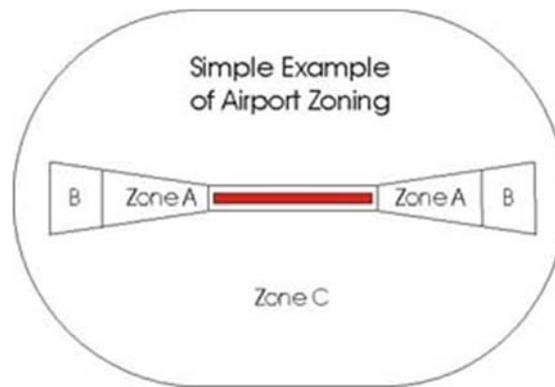
Wisconsin Statute 114.136 (airport and spaceport approach protection) provides public airport owners the authority to impose height limitations on structures within three miles of an airport. This height limitation zoning protects the community and the airspace for use by aircraft to and from the Airport. Portions of

Minnesota Point including Duluth-Sky Harbor Airport, as well as the City of Superior, are governed by the Richard I. Bong Memorial Airport Height Limitation Zoning Ordinance, adopted through Wisconsin Statute 114.136, which is also included in the City of Superior Municipal Code, Chapter 122. According to this ordinance, no structures on Minnesota Point shall exceed 811 feet MSL.

3.4.3.3 Airport Zoning

Minnesota Rules Chapter 8800.2400 describes the minimum standards for the zoning of public airports as to airspace, land use safety, and noise sensitivity. The rule includes boundaries (Zones A, B, and C – see diagram below) established for the purpose of restricting those uses that may be hazardous to the operational safety of aircraft using an airport, and furthermore, to protect the safety and property of people on the ground in the area near an airport. This is accomplished by limiting population and building density in the runway approach areas, thereby creating sufficient open space to protect life and property in case of an accident.

The safety zones are intended to protect the investment in an airport by limiting or preventing situations that would become an incompatible land use, and potentially affect airport safety and durability.



The City of Duluth-Sky Harbor Airport Zoning Ordinance, Ordinance Number 9215 (Adopted in September 1994) and Airport Overlay District, Article 2, Section 50.18.2 (adopted in August 2010) addresses the requirements of Minnesota Rule 8800.2400. The UDC defines safety zones for the existing airport facilities and regulates and restricts the presence and height of structures and natural growth objects and the use of property in the vicinity of the Airport. Because the Airport had previously planned to extend the runway longer than 3,050 feet, the existing ordinance is based on a 3,350 foot long runway. The following land use safety zones were established with relation to the Airport and Runway 14/32 and are shown on **Figure 3-7**:

- **Safety Zone A** extends outward from the end of the primary surface a distance equal to two-thirds of the planned runway length, in this case 2,230 feet. No buildings, temporary structures, exposed transmission lines, or other similar land use structural hazards are allowed in Zone A. Land uses in Zone A are restricted to those that do not create, attract, or bring together an assembly of people. Permitted uses may include agriculture (seasonal crops), horticulture, raising of livestock, animal husbandry, wildlife habitat, light outdoor recreation (non-spectator), cemeteries, and auto parking.
- **Safety Zone B** extends outward from Safety Zone A to a distance equal to one-third of the planned runway length, in this case 1,120 feet. Use in Zone B is restricted to those that do not create, attract, or bring together a site population that would exceed 15 times that of the site acreage. Parcel size is limited to less than three (3) acres in Zone B and no more than one building site on each parcel is allowed. Churches, hospitals, schools, theaters, stadiums, hotels and motels, trailer courts, camp grounds, and other places of public or semipublic assembly are specifically prohibited in Zone B.

The provisions of Zone A and Zone B do not apply to land uses in “established residential neighborhoods in built up urban areas.” This means that in an area designated as such, existing land uses will be allowed to continue as a conforming use with a few restrictions.

- **Safety Zone C** includes all the land enclosed within the perimeter of the horizontal zone (6,000 foot diameter arc beginning at the end of the primary surface) and not included in Zone A or Zone B. Land uses in Zone C are subject only to the general restrictions that no use creates or causes interference with the operation of radio or electronic facilities on the Airport, or with radio or electronic communications between the Airport and aircraft.

3.4.3.4 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

The preliminary preferred alternative would not change the land use of the Airport or the surrounding area and therefore these uses would be compatible with the Comprehensive Land Use Plan. While an airport is not a compatible use with the R-1 zoning of Duluth-Sky Harbor Airport, it is anticipated that when the City of Duluth completes the rezoning process, the Airport will be a permitted use of the area.

The anchorage area located in Superior Bay in the Runway 32 approach is incompatible with Zone A when in use by tall vessels. However, it is not currently dredged to a usable depth and the USACE in coordination with the United States Coast Guard (USCG) has agreed to issue a Notice to Navigational Interests indicating that a portion of the anchorage area is unusable due to this incompatible use (see correspondence in **Appendix G**). The Airport intends to seek permanent deauthorization of a portion of the anchorage area facility, permanently eliminating the potential incompatible use. Therefore, Alternative 5a Short would be compatible with the existing Airport Overlay district. Initial discussions with MnDOT Aeronautics indicate that Alternative 5a Short would not require an update to the Airport Overlay district standards in the UDC.

Alternative 13

Similar to Alternative 5a Short, Alternative 13 would not change the land use of the Airport or the surrounding area and therefore these uses would be compatible with the Comprehensive Land Use Plan. Also, similar to Alternative 5a Short, it is anticipated that if Alternative 13 were implemented, the City of Duluth would rezone the Airport so that the Airport use is permitted. A portion of the anchorage area located in the approach to Runway 32 is an incompatible use with Alternative 13. However, it is anticipated that the USACE and USCG would issue a Notice to Navigational Interests indicating a portion of the anchorage area is closed and that the Airport would seek permanent de-authorization of a portion of the anchorage area.

Alternative 13 would be compatible with the existing Airport Overlay district standards in the UDC, and would not require an update to the standards.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility and thus it would result in a change in land use of the Airport property. After Airport closure, the property would be used for recreational purposes. This use would be incompatible with the use outlined in the Comprehensive Land Use Plan (Transportation and Utilities). However, it is anticipated that the Comprehensive Land Use Plan would then be revised to reflect the recreation use when the plan was next updated. Similar to Alternatives 5a Short and 13, it is expected that the Airport land would be rezoned to match the future recreational use of the area in this alternative.

Since the Airport Overlay district would no longer be needed to protect the Airport and the surrounding areas for aeronautical uses, the Joint Airport Zoning Board that was created to develop the ordinance would reconvene and would revoke the ordinance.

3.5 Construction Impacts

3.5.1 Odors, Noise, and Dust (EAW Item 16.c. and Item 17)

***EAW Item 16.c. Dust and Odors.** Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 16a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors.*

***EAW Item 17. Noise.** Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that will be taken to minimize or mitigate the effects of noise.*

Construction impacts are generally temporary in nature and include: construction equipment noise and exhaust; noise and dust from the delivery of materials through residential areas; off-site disruptions of local traffic patterns; use and mitigation of borrow and waste sites; and excessive dust.

Noise and dust effects from construction equipment would be minimized through the use of construction BMPs. The contractor would be required to carry out dust and erosion control procedures, such as watering to control dust and wind erosion, seeding with oats in work areas that are temporarily inactive, and installation and maintenance of silt fence. These requirements would be included in the project drawings and specifications under the FAA standard specification Item P-156, "Temporary Air and Water Pollution, Soil Erosion, and Siltation Control." These measures would also be part of the Storm Water Pollution Prevention Plan (SWPPP) developed in association with the NPDES Construction Permit. The dust and erosion control procedures would be required to be maintained throughout the construction activity and until disturbed areas are restabilized. All phases of construction would be performed in accordance with FAA AC 150/5370-10B, Standards for Specifying Construction of Airports.

The CAA General Conformity rules, which do not apply to this project, address construction impacts related to air quality (see **Section 3.1**).

3.5.2 Erosion and Sedimentation (EAW Item 11.b.ii.)

***EAW Item 11.b.ii. Stormwater.** Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.*

The National Pollutant Discharge Elimination System (NPDES) is a construction permitting program addressing storm water effects of disturbances on one acre or more. In the State of Minnesota, this program is administered by the Minnesota Pollution Control Agency (MPCA). NPDES permits will be required prior to construction.

There are no existing steep slopes or highly erodible soils on the project site. According to the Natural Resources Conservation Service (NRCS) Web Soil Survey (2012), the soils in the construction area consist of Udipsamments with 1 to 20 percent slopes. These sandy soils are excessively drained, have no frequency of flooding, and possess very high water infiltration rates of up to 20 inches per hour.

The potential for soil erosion due to water on this site is very low. The soil K factor, indicating the susceptibility of a soil to sheet and rill erosion by water, is 0.15 (values of K range from 0.02 to 0.69). The likelihood of flooding or ponding is none, meaning flooding is not probable and the chance is near zero percent in any year.

The wind erodibility group (WEG) of these soils is 2, meaning they are highly susceptible to wind erosion when cultivated. Soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The wind erodibility index for site soils is 134 tons/acre/year indicating a high potential for wind erosion when cultivated. Mitigation measures to minimize the effects of wind erosion on the site during construction activities will include the use of silt fence or other appropriate erosion control measures around the construction site perimeter in addition to seeding and mulching of exposed soils where construction is not active.

3.5.2.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Construction activities can create environmental impacts at the construction site and in the surrounding area. These impacts are temporary in nature, and subside once construction is completed.

Alternative 5a Short includes moving and placing approximately 69,800 cubic yards of soil for runway construction (combined in water and on land), 50,000 cubic yards of surcharge (fill to be placed in order to compact soft soils, and then removed) material and 25,000 tons of riprap over a total project area of 29.47 acres. As described in **Section 2.1**, construction will occur in the following stages (see **Figures 2-2** and **2-3**):

- **Perimeter Berm Stage:** This stage includes construction of a perimeter berm encompassing the site in the harbor. The berm will be underlain by a separation geotextile and will be constructed to an elevation of 603 to 605 feet above mean sea level (MSL). A floating silt curtain will be placed around the perimeter of the site prior to placement of any fill in the bay and will remain in place for the duration of fill placement. It is anticipated that this perimeter berm will be constructed of rock in order to provide a stable access road around the site for construction. Prior to riprap placement, approximately 8,600 cubic yards of material will be excavated from the lake bottom for the riprap toe (see **Figure 2-3**). The excavated material will be stored on site for use as fill or surcharge. The Airport will be closed during periods of construction of this stage but will re-open during the stabilization period.
- **Stage 1:** Fill will be placed within the perimeter berm up to an elevation of 605 feet MSL. Riprap placement around the project perimeter for permanent erosion control will also be completed at this time. A reinforcement geotextile will be placed at 602 feet MSL, or slightly above lake level, to prevent slope failure. Upon completion of Stage 1, the site will stabilize in place over a period of three months prior to construction of Stage 2. Heavy duty silt fence will be used along the embankment after each phase of fill. The runway will be closed during periods of construction of this stage but will re-open during the stabilization period.
- **Stage 2:** The remaining fill and a surcharge of five feet will be placed. Since the grade of the proposed runway is variable, the top elevation of the surcharge will vary from 611 feet to 614 feet MSL. The surcharge will need to stabilize over a period of approximately six to nine months. The floating silt curtain will be required to be removed over winter months. However, heavy duty silt fence will again be used along the embankment after each phase of fill. The runway will be closed for the duration of this stage since surcharge will be required to be placed within the existing runway safety area.

- Stage 3: The excess surcharge will be removed and the runway and taxiway will be constructed. A typical section of the runway and completed fill is shown on **Figure 2-3**. The runway will remain closed for the duration of this stage.

Fill will be placed in these stages along with a reinforcement geotextile (ultimate tensile strength of 17,500 pounds per linear foot) in order to prevent slope failure (see **Figure 2-3**). Noise and dust effects from construction equipment would be minimized through the use of construction BMPs. The contractor would be required to carry out dust and erosion control procedures, such as watering to control dust and wind erosion, seeding with a temporary cover crop (oats) in work areas that are temporarily inactive, and installation and maintenance of silt fence. These requirements would be included in the project drawings and specifications under the FAA standard specification Item P-156, "Temporary Air and Water Pollution, Soil Erosion, and Siltation Control." These measures would also be part of the Storm Water Pollution Prevention Plan (SWPPP) developed in association with the NPDES Construction Permit. The dust and erosion control procedures would be required to be maintained throughout the construction activity and until disturbed areas are restabilized. All phases of construction would be performed in accordance with FAA AC 150/5370-10B, Standards for Specifying Construction of Airports.

Construction of the proposed project would result in creation of over one acre of new impervious surface; however, the existing runway and taxiway are proposed to be obliterated and there will be a net decrease in impervious surface post construction. Because there will be a net decrease in impervious, permanent control and treatment of surface water runoff under the NPDES/State Disposal System (SDS) Permit Program is not required. Additional discussion of stormwater runoff and management is included in **Section 3.16.5**.

There are no design features of the proposed project that have the potential to be affected by increases in precipitation or storm frequency due to climate change; therefore, climate change is anticipated to have no effect on erosion or sedimentation on the site.

Earth-moving equipment would be active on the site during reconstruction of the runway and would result in a temporary increase in noise and dust in the immediate project area (within airport boundary). In addition, the material brought to the site via truck will travel on Lake Avenue through Canal Park, a tourist and recreation district, across the Aerial Lift Bridge, and down Minnesota Avenue on Minnesota Point, increasing noise and potential dust to these areas as well. The fill material used for runway construction will likely be brought to the project site using a combination of trucking and barging depending on material type and source. It is anticipated that the material used during the perimeter berm stage will be trucked to the site (approximately 1,800 truck trips traveling the above-mentioned route through Canal Park and on Minnesota Avenue). Materials used for Stages 1 and 2 will be a mix of materials from on site (material excavated for the riprap toe during the Perimeter Berm Stage, reclaimed pavement and base course, and material excavated for the taxiway, ditching and miscellaneous areas) and materials brought to the site using hydraulic pumping from a barge to the project site. While there will be no trucks hauling material, there will be minor construction automobile traffic during this stage. The final stage, Stage 3, will utilize trucking (approximately 1,800 truck trips through Canal Park and on Minnesota Avenue) to transport materials (topsoil borrow, class 5 aggregate base, and asphalt) to the site. Excess material from the surcharge will be reused on site and will not require additional trucks for removal from the site. In an effort to promote construction procedures to protect, enhance and maintain a favorable environment, consultation with the contractor would be required prior to beginning construction. This meeting would serve to inform and instruct the contractor about the techniques and procedures included in the project construction drawings and specifications. Project updates and proposed schedules would also be provided to area residents and airport users.

Alternative 13

Alternative 13 would result in grading of approximately 28 acres of land. Approximately 24,360 cubic yards of material would be required for fill in Superior Bay. In addition to this, existing soils on the Airport site would be required to be moved in order to grade the area of the proposed runway and taxiway to FAA standards. This amount of soil is unknown.

Fill will be placed in stages similar to those of Alternative 5a Short along with a reinforcement geotextile in order to prevent slope failure. Noise and dust effects from construction equipment would be minimized through the use of construction BMPs. The contractor would be required to carry out dust and erosion control procedures such as watering to control dust and wind erosion, seeding with fast growing grass in work areas that are temporarily inactive, and installation and maintenance of silt fence. These requirements would be included in the project drawings and specifications under the FAA standard specification Item P-156, "Temporary Air and Water Pollution, Soil Erosion, and Siltation Control." These measures would also be part of the SWPPP developed in association with the NPDES Construction Permit. The dust and erosion control procedures would be required to be maintained throughout the construction activity and until disturbed areas are restabilized. All phases of construction would be performed in accordance with FAA AC 150/5370-10B, Standards for Specifying Construction of Airports.

Earth moving equipment would be active on the site during reconstruction of the runway and would result in a temporary increase in noise and dust in the immediate project area (within the Airport boundary). In addition, the material brought to the site via truck will travel on Lake Avenue through Canal Park, a tourist and recreation district, across the Aerial Lift Bridge, and down Minnesota Avenue on Minnesota Point, increasing noise and potential dust to these areas as well. The fill material used for runway construction will likely be brought to the project site using a combination of trucking and barging depending on material type and source.

Also, in an effort to promote construction procedures to protect, enhance and maintain a favorable environment, consultation with the contractor would be required prior to beginning construction. This meeting would serve to inform and instruct the contractor about the techniques and procedures included in the project construction drawings and specifications.

Construction of the proposed project would result in creation of over one acre of new impervious surface and require control and treatment of surface water runoff under the NPDES/SDS Permit Program. Additional discussion of stormwater runoff and management is included in **Section 3.16.5**.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. The entire airport site (35.0 acres) would be graded after removal of airport facilities. The number of cubic yards of soil to be moved during the grading activities is unknown.

Noise and dust effects from construction equipment would be minimized through the use of construction BMPs. The contractor would be required to carry out dust and erosion control procedures such as watering to control dust and wind erosion, seeding with fast growing grass in work areas that are temporarily inactive, and installation and maintenance of silt fence. These requirements would be included in the project drawings and specifications under the FAA standard specification Item P-156, "Temporary Air and Water Pollution, Soil Erosion, and Siltation Control." These measures would also be part of the SWPPP developed in association with the NPDES Construction Permit. The dust and erosion control procedures would be required to be maintained throughout the construction activity and until disturbed areas are restabilized. All phases of construction would be performed in accordance with FAA AC 150/5370-10B, Standards for Specifying Construction of Airports.

Earth-moving equipment would be active on the site during removal of airport facilities and would result in a temporary increase in noise and dust in the immediate project area (within the Airport boundary). In addition, the material removed from the site via truck will travel down Minnesota Avenue on Minnesota Point, across the Aerial Lift Bridge, and through Canal Park, a tourist and recreation district, increasing dust and noise to these areas as well.

The areas disturbed by construction would be approximately 0.3 miles from Park Point Recreation Area and Beach. The area is approximately 0.6 miles from the nearest off-airport residence. The local community and residents could expect several seasons to a decade or more of activity associated with reclamation and ecological restoration of the site upon decommissioning and removal of the Airport facility.

Also, in an effort to promote construction procedures to protect, enhance and maintain a favorable environment, consultation with the contractor would be required prior to beginning construction. This meeting would serve to inform and instruct the contractor about the techniques and procedures included in the project construction drawings and specifications.

3.5.3 Traffic (EAW Item 18)

The project does not involve expansion of traffic, and no parking spaces will be added. Temporary construction impacts due to traffic are compared for the alternatives below.

Preliminary Preferred Alternative: Alternative 5a Short

Traveling to the Airport site for construction of the preliminary preferred alternative requires travel through Canal Park and across the Aerial Lift Bridge, increasing traffic in this area during construction. Canal Park is the most popular tourist and recreation-oriented destination in Duluth, particularly in the summer months. The Aerial Lift Bridge provides the only road access and evacuation route from Minnesota Point across the ship canal to Canal Park. The current Aerial Lift Bridge operation schedule is designed to reduce the number of traffic backups by limiting bridge opening during the peak navigation and tourist season [late May through early September, seven (7) days per week, 7:00 am – 9:00 pm], but the Aerial Lift Bridge still opens approximately every half hour and on demand for large ships during the peak season. Aerial Lift Bridge operations can create traffic backups in both directions and would increase trucks idling in these areas. Between Memorial Day and Labor Day, backups in Canal Park and Minnesota Point as long as ½ mile are commonly experienced during periods of Aerial Lift Bridge opening. The bridge takes about three (3) minutes to raise to its full height (opening height depends on the height of the vessel seeking passage), and traffic is blocked for up to 12 minutes to allow time for the bridge to raise, ship traffic to pass, and the bridge to lower again. The Aerial Lift Bridge is listed on the NRHP. The bridge has no load restrictions and any legal load may cross the bridge without a permit. Therefore, no impacts are anticipated to the Aerial Lift Bridge as a result of construction traffic. However, additional consultation with SHPO will take place, if required, after final design is complete and the extent and timing of truck traffic over the lift bridge is known.

Trucks transporting material to the project site would travel on Minnesota Point from the Aerial Lift Bridge to the project site. There is the potential that trucks may damage the existing roadway. The contractor would be required to repair the existing roadway to preconstruction conditions after completion of runway construction.

Impacts caused by material trucking will be minimized through utilization of hydraulic pumping of fill materials as described in **Section 2.1**.

The Airport runway would close for periods of the Perimeter Berm Stage, Stages 1 and 2, and for the duration of Phase 3. Based aircraft and businesses would be impacted by the temporary Airport closures. Seaplane use of the facility may continue through these phases with only intermittent closures due to construction vehicle activity. Based aircraft could remain hangared at the Airport during construction but would not have access to the runway while it is closed. The businesses located at the Airport would be impacted during periods of runway closure due to limited access to their business. Hangar 10 Aero's business is based primarily on wheeled aircraft that require runway use. Jonathan Aero's business includes both wheeled, amphibian and float geared aircraft. The portion of that business activity that relies on runway use would be impacted by construction. Alternately, based aircraft or businesses could temporarily relocate to other area airports (Richard I. Bong Superior Airport or Duluth International Airport).

It is expected that construction of the preliminary preferred alternative would be completed within two construction seasons. Construction activities could extend into winter months, but would be limited to daylight hours between 7:00 am and 7:00 pm in order to reduce the noise impact on area residences. Also, final design will evaluate options for minimizing impacts to Canal Park and Minnesota Point during the peak tourist season by limiting construction and/or construction traffic during this time where possible. The areas disturbed by construction would be approximately 0.3 miles from Park Point Recreation Area and Beach. The area is approximately 0.6 miles from the nearest off-airport residence. One residence is located on airport property in the terminal building and is used for airport employees.

Alternative 13

Traveling to the Airport site requires travel through Canal Park and across the Aerial Lift Bridge, increasing traffic in this area during construction. Construction traffic impacts to the popular tourist and recreation-oriented Canal Park due to Alternative 13 would be similar to those described above for the preliminary preferred alternative. The Aerial Lift Bridge provides the only road access and evacuation route from Minnesota Point across the ship canal to Canal Park. The current Aerial Lift Bridge operation schedule is designed to reduce the number of traffic backups by limiting bridge opening during the peak navigation and tourist season [late May through early September, seven (7) days per week, 7:00 am - 9:00 pm], but the Aerial Lift Bridge still opens approximately every half hour and on demand for large ships during the peak season. Aerial Lift Bridge operations can create traffic backups in both directions which would lead to an increase in trucks idling in these areas. Between Memorial Day and Labor Day, backups in Canal Park and Minnesota Point as long as 1/2 mile are commonly experienced during periods of Aerial Lift Bridge opening. The bridge takes about three (3) minutes to raise to its full height (opening height depends on the height of the vessel seeking passage), and traffic is blocked for up to 12 minutes to allow time for the bridge to raise, ship traffic to pass, and the bridge to lower again. The Aerial Lift Bridge is listed on the NRHP. The bridge has no load restrictions and any legal load may cross the bridge without a permit. Therefore, no impacts are anticipated to the Aerial Lift Bridge as a result of construction traffic. However, additional consultation with SHPO will take place, if required, after final design is complete and the extent and timing of truck traffic over the lift bridge is known.

Trucks transporting material to the project site would travel on Minnesota Point from the Aerial Lift Bridge to the project site. There is the potential that trucks may damage the existing roadway. The contractor would be required to repair the existing roadway to preconstruction conditions after completion of runway construction.

The runway would close for periods of runway construction. Based aircraft and businesses would be impacted by the temporary closures. Seaplane use of the facility may continue through these phases with only intermittent closures due to construction vehicle activity. Based aircraft could remain hangared at the Airport during construction but would not have access to the runway while it is closed. The businesses located at the Airport would be impacted during periods of runway closure due to limited access to their business. Hangar

10 Aero's business is based primarily on wheeled aircraft that require runway use. Jonathan Aero's business includes both wheeled, amphibian and float geared aircraft. The portion of that business activity that relies on runway use would be impacted by construction. Alternately, based aircraft or businesses could temporarily relocate to other area airports (Richard I. Bong Superior Airport or Duluth International Airport).

It is expected that construction of the Alternative 13 would be completed within two construction seasons. Construction activities could extend into winter months, but would be limited to daylight hours between 7:00 am and 7:00 pm in order to reduce the noise impact on area residences. Also, final design will evaluate options for minimizing impacts to Canal Park and Minnesota Point during the peak tourist season by limiting construction and/or construction traffic during this time where possible. The areas disturbed by construction would be approximately 0.3 miles from Park Point Recreation Area and Beach. The area is approximately 0.6 miles from the nearest off-airport residence. One residence is located on airport property in the terminal building and is used for airport employees.

No Action

The no action alternative would result in loss of Airport licensure and closure and decommissioning of the facility. Material removed from the site via truck will travel down Minnesota Avenue on Minnesota Point, across the Aerial Lift Bridge, and through Canal Park, a tourist and recreation district, temporarily increasing dust, traffic, and noise to these areas.

It is expected that construction of the no action alternative would be completed within one construction season. Construction activities could extend into winter months, but would be limited to daylight hours between 7:00 am and 7:00 pm in order to reduce the noise impact on area residences. Also, final design will evaluate options for minimizing impacts to Canal Park and Minnesota Point during the peak tourist season by limiting construction and/or construction traffic during this time where possible.

3.5.4 Air Quality (EAW Item 16.b.)

EAW Item 16.b. Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational movements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions).

The City of Duluth, including the Airport, is a Maintenance Area for carbon monoxide (CO) according to EPA guidelines (see **Section 3.1**). Air quality analysis may be required for air emissions due to construction traffic.

Preliminary Preferred Alternative: Alternative 5a Short

Construction traffic due to the preliminary preferred alternative is unlikely to increase traffic/congestion at any intersections with LOS D, E, or F. An air quality analysis will be completed once the route and extent of trucking necessary to bring material to and from the Airport is known.

Alternative 13

Construction traffic due to the Alternative 13 is unlikely to increase traffic/congestion at any intersections with LOS D, E, or F. An air quality analysis will be completed once the route and extent of trucking necessary to bring material to and from the Airport is known.

No Action

The no action alternative would result in loss of Airport licensure and closure and decommissioning of the facility. Construction traffic is unlikely to increase traffic/congestion at any intersections with LOS D, E, or F. An air quality analysis will be completed once the route and extent of trucking necessary to bring material to and from the Airport is known.

3.6 Department of Transportation Act: Section 4(f) (EAW Item 9.a.i.)

EAW Item 9.a.i. Describe existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

Section 4(f) legislation was established under the Department of Transportation (DOT) Act of 1966 (now codified at 49 USC 303, and 23 USC 138) and provides protection for publicly owned land in public parks, recreation areas, or wildlife and waterfowl refuges of national, state, or local significance or lands from an historic site of national, state, or local significance. Any part of a publicly owned park, recreation area, refuge, or historic site is presumed to be significant unless there is a statement of insignificance relative to the whole park by the federal, state, or local official having jurisdiction thereof. The Section 4(f) regulations require the consideration of feasible and prudent alternatives that avoid using the Section 4(f) resource. If impacts cannot be avoided, measures to minimize harm must be included with the project.

The Minnesota Point Pine Forest SNA is a significant publicly owned recreation area, which therefore qualifies it as a Section 4(f) resource. Several other Section 4(f) resources exist in the vicinity of the Airport, but are not within the project area and will not be impacted. These include: Park Point, Park Point Trail, Park Point Recreation Area, Point Zero Light House, Hartman Park, and Southworth Marsh Wildlife Refuge. The Minnesota Point Pine Forest SNA consists of approximately 18 acres in two separate parcels adjacent to and southeast of the Airport as shown on **Figure 1-2**. The two parcels are divided by an opening in the forest created around 1968 by SWLP to accommodate electrical and water pumping substations and the easement for the water utility to the City of Superior, Wisconsin. The Minnesota Land Trust established a Conservation Easement with the State of Minnesota on June 30, 1999 to preserve and protect a portion of the pine forest, sand dunes, and lakeshore. The Minnesota Point Pine Forest SNA was then established in April 2002 and is now managed and protected by the MNDNR.

As described in **Section 3.2.2.3**, the SNA consists of a mixed-age pine forest found on stabilized sand dunes (MNDNR 2003), which are a function of the strong lakeside winds that created and maintain the sand dunes on the point. The sand spit itself was probably formed about 5,000 years ago and is one of the “newest” (geologically speaking) examples of this type of feature in the bay. The uniqueness of the forest stand and its location on Minnesota Point are key factors as to how this resource contributes to Minnesota’s natural heritage. The red and white pine woodland in the SNA is the last natural remnant of a forest that stretched the length of Minnesota Point, which separates the St. Louis River estuary from Lake Superior (MNDNR 2003).

Classification of trees in the SNA forest as meeting the “old-growth” criteria set forth by the MNDNR requires natural forests that have developed over a long period of time, generally at least 120 years, without experiencing severe, stand-replacing disturbance (e.g., fire, windstorm, or logging). The old-growth trees in the now urban setting are uniquely significant in Minnesota “by virtue of its presence on Lake Superior sand dunes” (Wilson and Rusterholz 1996), with the red and white pine woodland, its understory components, and ecological setting being the only example of this in Minnesota. The MNDNR has mapped this plant community in its Ecological Classification System (ECS) as “Red Pine-White Pine Woodland” (ECS code FDn32b). Other examples of this plant community nearby or in a similar ecological setting are essentially limited to nearby Wisconsin Point (in Superior, Wisconsin) and on the lee shore of some islands within Wisconsin’s Apostle Islands National Lakeshore near Bayfield, Wisconsin (Wilson and Rusterholz 1996).

There is an established, single foot trail (Park Point Trail) that traverses the pine forest including a portion through the SNA. This trail is for non-motorized use only. It is currently used by pedestrians, including their pets, and bicyclists. Although State Statute and Administrative Rule do not allow pets and bicycles in SNAs, some conditions exist where these activities could be allowed if so authorized through the use guidelines developed for a specific SNA. Pedestrian and bicycle use of trails (including with pets) in the Minnesota Point Pine Forest and designated SNA are pre-existing activities from before the SNA was designated. There is no history of enforcement action to discontinue these uses, and in May 2014 the MNDNR held a public hearing to receive public comments regarding allowing some of these recreational uses in the SNA. It is likely these typically unallowable uses of an SNA would continue so long as they remain a manageable use with no deleterious effects to the SNA, surrounding old-growth forest, or other significant ecological resources.

3.6.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short does not result in impacts to any trees within the Section 4(f) resource (the Minnesota Point Pine Forest SNA) nor does it limit or prohibit access to the resource. Therefore, no permanent impacts to Section 4(f) resources are anticipated as a result of Alternative 5a Short.

As initially proposed, temporary impacts to the Section 4(f) resource would have occurred due to light vehicle traffic necessary for construction of a new obstruction light on DAA property as shown on **Figure 2-1**. It would have been necessary for light vehicle traffic to travel through the SNA property to access the new obstruction light furthest from Airport property. Vehicles accessing the site would potentially disturb a path 12 feet wide of Juniper Dune Shrubland community in order to access the proposed site of the new obstruction light. In order to avoid impacts to the Section 4(f) resource, as well as avoid impacts to native plant communities and listed species, this obstruction light has been eliminated from the preliminary preferred alternative. If the second new obstruction light is ultimately required for safety reasons, a permit will be sought from the commissioner of the DNR as well as permission from Minnesota Land Trust to access the SNA property. Additionally, coordination with DNR will take place regarding potential impacts to state-listed threatened species. Consultation with USFWS would also take place for potential impacts to the piping plover.

Alternative 13

Alternative 13 includes the immediate removal/topping of approximately 60 trees in the approach surface, including 3 trees (1 red pine and 2 white pine) in the SNA, which is a Section 4(f) resource. Approximately 76 trees (27 red pine, 41 white pine, 8 other species) would require topping or removal by 2063. The area of tree removal would be managed as beach heather-juniper community instead of old-growth forest. Alternative 13 would not limit or prohibit access to the Section 4(f) resource.

A formal Section 4(f) evaluation would be required if Alternative 13 is selected as the preferred alternative. Since Alternative 5a Short has been selected as the preliminary preferred alternative, the Section 4(f) evaluation was not completed. If Alternative 13 becomes the preferred alternative, a Section 4(f) evaluation will be completed. The Section 4(f) evaluation would have to demonstrate that Alternative 13 is the only feasible and prudent alternative in order for the FAA to participate in funding or approve the project. It is anticipated that this would be difficult to prove given the preliminary preferred alternative has no Section 4(f) impacts.

No Action

The no action alternative would result in loss of Airport licensure and Airport closure. The closure and rededication of the site to recreation purposes is not expected to impact the Section 4(f) resource.

3.7 Energy Supply and Natural Resources

Energy resources include all basic fuel supplies that are utilized for heating, electrical production, transportation, and other forms of energy requirements. Electric service is provided by Minnesota Power. The A/D Building uses fuel oil for heating and the fuel oil is provided by Caywood Oil LLC. Como Oil and Propane provides propane to the A/D Building.

The effects of airport development on energy and natural resources are generally related to the amount of energy required for stationary facilities (i.e., terminal building cooling or heating equipment, electrical lighting for the interior of buildings and the airfield, and approach systems), and movement of aircraft and ground vehicles.

3.7.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

The energy needs of the Airport would decrease as a result of the preliminary preferred alternative due to the decrease in airfield lighting that results from a decrease in runway length from the existing conditions (decrease from 3,050 feet to 2,600 feet). Movement of aircraft and ground vehicles would not substantially change as part of this alternative. There would be no net increase in energy needs from the new obstruction light as the total number of lights will decrease (from 4 to 3) compared to the existing conditions.

Alternative 13

The energy needs of the Airport would decrease as a result of the Alternative 13 due to the decrease in airfield lighting that results from a decrease in runway length from the existing conditions (decrease from 3,050 feet to 2,600 feet). Movement of aircraft and ground vehicles would not substantially change as part of this alternative. There would be no net increase in energy needs from the one new obstruction light as the total number of lights will remain decrease (from 4 to 3) compared to the existing conditions.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. The closure and removal of airport facilities as part of this alternative would eliminate the energy and natural resource needs of the Airport.

3.8 Farmlands (*EAW Item 9.a.i.*)

EAW Item 9.a.i. Describe existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.

The Farmland Protection Policy Act (FPPA) was enacted to minimize the extent to which federal actions contribute to the conversion of farmland to non-agricultural uses. As used in the FPPA, farmland includes prime and unique farmland and land of statewide or local importance. “Farmland” subject to FPPA requirements does not have to be currently used for cropland. It can be forestland, pastureland, cropland, or other land not under water or built-up.

While some areas across the bay in Superior, Wisconsin contain prime farmland or soils of statewide importance, no soils within the Airport boundary or adjacent to the Airport are designated prime or unique farmlands (see **Figure 3-8**).

3.8.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short would not result in impacts to prime farmland or soils of statewide importance.

Alternative 13

Alternative 13 would not result in impacts to prime farmland or soils of statewide importance.

No Action

The no action alternative would not result in impacts to prime farmland or soils of statewide importance.

3.9 Floodplains

Executive Order 11988, *Floodplain Management*, bans federal actions in a floodplain unless no practicable alternative exists, and requires measures to minimize unavoidable short-term and long-term impacts if the preferred alternative is constructed in a floodplain. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) were reviewed to determine if the preferred alternative would result in development within a 100-year floodplain.

The FIRM for the City of Duluth, Minnesota, St. Louis County – Panel Number 270421 0040, effective February 1, 1980 indicates that the Airport and all of Minnesota Point are located outside the FEMA designated 100-year floodplain of Lake Superior (see **Figure 3-9**). The Airport is located in Zone C, indicating it is of higher elevation than the 500-year flood.

The adjacent areas of Lake Superior and Superior Bay are identified as Zone A1 on the FIRM. This means the area is subject to the 100-year flood event as determined by detailed methods. The map indicates the methodology indicates a base flood elevation (BFE) of 605 feet. The FIRM indicates that flood insurance is not available for new construction or substantially improved structures on and after November 16, 1990 in designated coastal barriers for the entire area of Minnesota Point south of 42nd Street South.

The City of Duluth Natural Resources Overlay Zone District Map indicates that the narrow strip of land immediately adjacent to the Airport runway on the bay side is designated as City General Floodplain zone. Further out in Superior Bay is considered a Floodway of Lake Superior. Neither the Airport nor the area immediately adjacent to it is located in the floodway.

3.9.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

This alternative requires approximately 69,800 cubic yards of fill material placed over approximately 7.49 acres of FEMA Zone A1 (City General Floodplain and Floodway District). The fill placement will be within Superior Bay, which functions more as a lacustrine (i.e. “lake”) system than a riverine (i.e. “river”) system, which means that there is little to no conveyance of floodwaters. Therefore, any increase in flood elevations would be related to the volume of floodplain storage lost due to fill. The volume of storage lost due to fill is approximately 2.1 acre-feet, which is a negligible fraction of the available 100-year floodplain storage of Superior Bay and therefore would result in no discernible increase in the flood elevations. A Special Use Permit from the City of Duluth will be required for fill in the floodplain.

Neither FEMA nor the City of Duluth requires compensatory storage for the loss of floodplain storage due to fill within the 100-year floodplain. Airport landing strips are a permitted use per City of Duluth zoning ordinance Section 50-18.c.2.a.ii, therefore no mitigation is proposed.

There are no new structures or additions to any structures as part of this project that are located in the floodplain or flood fringe area. Therefore, the project should be in compliance with the Flood Hazard Areas provisions (City of Duluth Unified Development Code 50-38.2B).

Alternative 13

This alternative includes approximately 24,360 cubic yards of fill placed over 3.4 acres of FEMA Zone A1 (City General Floodplain and Floodway District). Similar to Alternative 5a Short, since the fill is within an area of non-conveyance, any associated increase in flood elevations would be related to the volume of floodplain storage lost due to the fill. The volume of the floodplain storage lost due to fill is approximately 0.6 acre-feet, a negligible fraction of the available 100-year floodplain storage of Superior Bay and therefore would result in no measurable increase in floodplain elevations. A Special Use Permit from the City of Duluth will be required for fill in the floodplain.

Neither FEMA nor the City of Duluth requires compensatory storage for the loss of floodplain storage due to fill within the 100-year floodplain. Airport landing strips are a permitted use per City of Duluth zoning ordinance Section 50-18.c.2.a.ii, therefore no mitigation is proposed.

There are no new structures or additions to any structures as part of this project that are located in the floodplain or flood fringe area. Therefore, the project should be in compliance with the Flood Hazard Areas provisions (City of Duluth Unified Development Code 50-38.2B).

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility and would not impact the floodplain.

3.10 Greenhouse Gases and Climate

Research has shown there is a direct correlation between fuel combustion and greenhouse gas emissions. In terms of U.S. contributions, the General Accounting Office reports that "domestic aviation contributes about 3% of total carbon dioxide emissions, according to EPA data," compared with other industrial sources including the remainder of the transportation sector (20%) and power generation (41%).⁷ The International Civil Aviation Organization (ICAO) estimates that greenhouse gas emissions from aircraft account for roughly 3% of all anthropogenic greenhouse gas emissions globally.⁸ Climate change due to greenhouse gas emissions is a global phenomenon, so the affected environment is the global climate.⁹

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in greenhouse gas emissions and climate. The FAA, with support from the U.S. Global Change Research Program and its participating Federal agencies (e.g., NASA, NOAA, EPA, and DOE), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for Air Transportation Noise & Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition.

⁷ *Aviation and Climate Change*. GAO Report to Congressional Committees, (2009). <http://www.gao.gov/new.items/d09554.pdf>

⁸ Alan Melrose, "European ATM and Climate Adaptation: A Scoping Study," in *ICAO Environmental Report*. (2010).

⁹ Federal Aviation Administration (FAA) Order 1050.1E, Change 1, Guidance Memo #3, *Considering Greenhouse Gases and Climate Change Under the National Environmental Policy Act (NEPA): Interim Guidance*, January 2012.

Similar research topics are being examined at the international level by the International Civil Aviation Organization.¹⁰

Although there are no Federal standards for aviation-related GHG emissions, it is well-established that greenhouse gas emissions can affect climate. The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analysis. As noted by CEQ, however, “it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions; as such direct linkage is difficult to isolate and to understand.”

3.10.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Based on FAA data, operations activity at the Airport, relative to aviation throughout the United States, represents less than 0.1% of US aviation activity. Therefore, assuming that greenhouse gases occur in proportions to the level of activity, greenhouse gas emissions associated with existing and future aviation activity at the Airport would be expected to represent less than 0.05% of US based greenhouse gases. Because of the related uncertainties involving the assessment of such emissions regionally and globally, the incremental contribution of this proposed action cannot be adequately assessed given the current state of the science and assessment methodology.¹¹ Therefore, one would not expect the emissions of greenhouse gases from this project to be significant.

Alternative 13

Based on FAA data, operations activity at the Airport, relative to aviation throughout the United States, represents less than 0.1% of US aviation activity. Therefore, assuming that greenhouse gases occur in proportions to the level of activity, greenhouse gas emissions associated with existing and future aviation activity at the Airport would be expected to represent less than 0.05% of US based greenhouse gases. Because of the related uncertainties involving the assessment of such emissions regionally and globally, the incremental contribution of this proposed action cannot be adequately assessed given the current state of the science and assessment methodology.¹² Therefore, one would not expect the emissions of greenhouse gases from this project to be significant.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. Due to Airport closure, aircraft traffic at the Airport and the immediate vicinity would presumably be reduced, thus reducing the GHG emissions generated at the Airport. If the Airport were to close, the area would be rededicated as a public recreational area. It is not known what land use would be associated with this recreational area. It is unknown if some eventual uses of the site in the no action alternative would contribute to GHG emissions in the future.

¹⁰ Lourdes Q. Maurice and David S. Lee. *Chapter 5: Aviation Impacts on Climate*. Final Report of the International Civil Aviation Organization (ICAO) Committee on Aviation and Environmental Protection (CAEP) Workshop. October 29th - November 2nd, 2007, Montreal. http://www.icao.int/icao/en/cnfrst/CAEP/CAEP_SG_20082/docs/Caep8_SG2_WPI0.pdf

¹¹ NEPA Regulations, Council on Environmental Quality, 40 CFR 1502.22, *Incomplete or unavailable information*.

¹² NEPA Regulations, Council on Environmental Quality, 40 CFR 1502.22, *Incomplete or unavailable information*.

3.11 Hazardous Materials, Pollution Prevention, and Solid Waste (*EAW Item 12.b., Item 12.c., and Item 12.d.*)

EAW Item 12.b. Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.

EAW Item 12.c. Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.

EAW Item 12.d. Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.

Solid wastes and hazardous materials/wastes are generated and stored at the Airport. Standard policies are employed at the Airport to minimize the potential for contamination due to these materials and wastes, including groundwater contamination. The aboveground tank and fuel system are subject to routine monitoring and reporting including daily, monthly, and quarterly inspections. Required Spill Prevention Control and Countermeasure (SPCC) plan inspections are also conducted and inspections and fuel safety activities are recorded as required.

Solid waste from the Airport owned facilities is collected by Waste Management. Private hangars contract for solid waste collection through private waste collection companies. All solid waste collected by licensed haulers in the City of Duluth area is transported to the solid waste transfer station operated by the Western Lake Superior Sanitary District (WLSSD). Waste delivered to the WLSSD is then transported to the Moccasin Mike Landfill in Superior, Wisconsin, a facility licensed by the Wisconsin Department of Natural Resources. Recyclable materials are not picked up from DAA owned facilities at the Airport. However, several private tenants contract recycling collection services including plastic, metal, glass, and cardboard through their waste hauler. Airport users can dispose of recyclable materials not handled by their waste hauler at the WLSSD Materials Recovery Center.

Duluth-Sky Harbor Airport collects and recycles used maintenance fluids, including engine and hydraulic oil, at the Duluth International Airport. When possible, the Airport uses recycled maintenance products.

A search of the MPCA database identified five (5) Hazardous Waste Generator Numbers issued for companies or individuals operating out of the Airport (**Table 3-5**). Communication with the Airport Manager indicates that one owner-operator, Jonathan Aero, operates three entities that are identified as Hazardous Waste Generators: Bill Smith Hangar (hangar 5), Foster Aviation, and North Star Aero Repair, as shown in **Table 3-5**.

**Table 3-5
Hazardous Waste Generators**

Entity/Owner-Operator	Hazardous Waste Generator Numbers ID #
Del Industries Inc.	MND985722248
Jonathan Aero (owns and operates three entities)	Bill Smith Hangar (hangar 5) – HWLIC1300025 Foster Aviation – HWLIC1300025 North Star Aero Repair – MNL1247
Don Macors Hangar	HWLIC1300024
Maco Aero	MNR000077164
Abateco	MND985756923

All generators were listed as Small to Minimal Quantity Generators. Only one of these generators (Don Macors Hangar) reported the actual handling of any material. In 2006 Don Macors Hangar reported generating three (3) gallons of paints/thinners and three (3) gallons of parts washer solvents, all of which were beneficially recycled. No other hazardous wastes have been reported or documented associated with the site.

3.11.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

The preliminary preferred alternative would not result in any change to waste generation or collection at the Airport or to collection and treatment of sanitary wastes. Solid waste from airport-owned facilities would continue to be collected by Waste Management and that from private hangars through their chosen contractors.

The preliminary preferred alternative would not result in any change in hazardous waste generation, collection, or disposal at the Airport. During construction solid wastes would be generated, which would consist mainly of concrete and asphalt debris derived from the re-orientation of the runway. These materials may be recycled by the construction contractor or at the selected disposal facility if suitable. If materials cannot be recycled disposal would occur at a licensed industrial or demolition waste disposal facility. Adequate space is available at licensed facilities should disposal be necessary. No additional hazardous wastes would be generated through the implementation of the preliminary preferred alternative.

Activities related to runway realignment are not expected to encounter contaminated soils, but this potential does exist. Excavation activities in the area will include environmental screening of soils by trained personnel. Potential for encountering contaminated soils is discussed in more detail in **Section 3.11.2**.

Alternative 13

The implementation of Alternative 13 would not result in any change to waste generation or collection at the Airport or to collection and treatment of sanitary wastes. Solid waste from airport-owned facilities would continue to be collected by Waste Management and that from private hangars through their chosen contractors.

Alternative 13 would not result in any change in hazardous waste generation, collection, or disposal at the Airport. During construction solid wastes would be generated, which would consist mainly of concrete and asphalt debris derived from the re-orientation of the runway. These materials may be recycled by the construction contractor or at the selected disposal facility if suitable. If materials cannot be recycled disposal will occur at a licensed industrial, or demolition waste disposal facility. Adequate space is available at licensed facilities should disposal be necessary. No additional hazardous wastes would be generated through the implementation of Alternative 13.

Activities related to runway realignment are not expected to encounter contaminated soils, but this potential does exist. Excavation activities in the area will include environmental screening of soils by trained personnel. Potential for encountering contaminated soils is discussed in more detail in **Section 3.11.2**.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. Closure of the facility would result in the demolition of airport buildings, hangars, runways, parking areas, fencing, etc. The demolition process would require all hazardous materials and asbestos containing materials to be identified and removed prior to dismantling. These materials would have to be documented and disposed of properly at licensed facilities. Non-hazardous materials, mainly classified as construction/demolition debris (C&D), would be generated and would be hauled off-site and disposed of at a licensed facility. Asphalt and concrete debris generated through the demolition of the parking areas, runways, etc., may be recycled by the demolition contractor or the selected disposal facility.

3.11.2 Above- and Belowground Tanks (EAW Item 12.a. and Item 12.c.)

***EAW Item 12.a. Pre-Project Site Conditions.** Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.*

***EAW Item 12.c. Project related use/storage of hazardous materials** - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location and size of any above or below ground tanks to store petroleum or other materials. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.*

Existing Conditions

The existing airport fuel system consists of the following onsite tanks;

- A 3,000-gallon aboveground 100 Low Lead (LL) avgas (aviation gasoline) fuel tank with 24-hour self service credit card fueling. Fuel is not stored in private hangars.
- A 260-gallon aboveground diesel fuel tank located in an airport owned hangar and holds fuel for airport equipment.
- A 270-gallon aboveground tank in the hangar attached to the A/D building that holds fuel oil used for heating the office and lobby area.
- A 500-gallon aboveground propane tank located behind the A/D building that is used for heating in the A/D building and attached hangar.

Standard policies are employed at the Airport to minimize the potential for contamination. The tanks and fuel system are subject to routine monitoring and reporting including daily, monthly, and quarterly inspections. Required SPCC plan inspections are also conducted and inspections and fuel safety activities are recorded as required.

Potentially Contaminated Sites

One petroleum fuel leak has been documented on airport property according to MPCA records (Leak ID Number 10326). It was first reported in 1997 and involved a 14-year-old, 8,000 gallon fiberglass underground storage tank (UST). Review of MPCA files related to this leak indicates that contamination was encountered in the soil around the tank during its removal in 1997. Groundwater was present at a depth of three (3) feet below the ground surface and groundwater impacts were evident. The MPCA was notified of the leak and the site was required to complete a remedial investigation of the contamination. The investigation involved the installation of a series of groundwater monitoring wells, which were used to evaluate groundwater flow conditions and the extent of contamination (see **Appendix H**). Groundwater flow direction was found to vary depending on influences from Superior Bay to the southeast, and Lake Superior to the northeast. Due to these variations and a very small flow gradient, the migration of contaminants from the original leak site was determined to be limited. Groundwater sampling and analyses occurred for a period of at least three to four years following discovery and results were reported to the MPCA. In 2004 the Airport requested that the leak site be considered for closure with no further requirements. The MPCA accepted the closure report in December 2004 due to the removal of the source of contamination, the stability of the contaminant plume around the leak site, the indication that the natural attenuation processes were degrading the contaminants, and the lack of receptors.

An empty 1,000 gallon below ground fuel oil tank that was located behind the A/D building was removed in May 2014. A corresponding "General Excavation Report Worksheet", MPCA Guidance Document 3-02 was completed and submitted to the MPCA by Environmental Trouble Shooters, Inc. This document dated June 13, 2014 indicated Diesel Range Organic (DRO) compounds were detected at a concentration of 30.6 mg/kg in the soil which is below the Minnesota Pollution Control Agency (MPCA) recommended action level of 100 mg/kg for DRO. Due to the fact that only minor contamination was detected, no further investigation and site closure was recommended in the document. As required, the contamination was reported to the Minnesota Duty Officer on May 22, 2014 and assigned the Leak Number 19481 by the MPCA.

3.11.2.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

The preliminary preferred alternative would not result in any change in fueling use or spill protection. The construction limits of the preliminary preferred alternative do not impact the closed petroleum leak site. However, the current extent of residual contamination is not known. Activities related to runway realignment are not expected to encounter contaminated soils, but this potential does exist. Excavation activities in the area will include environmental screening of soils by trained personnel using a photo-ionization detector (PID) to identify soils potentially impacted by petroleum contaminants. Any impacted soils would be segregated from other soils in a containment area, placed on 10 mm polyethylene plastic, and covered with 10 mm plastic, to prevent infiltration of precipitation and dispersal of the contaminated soils. Soils identified as potentially impacted would be sampled and analyzed in accordance with MPCA guidance documents to allow characterization prior to disposal. Soils characterized as being impacted by petroleum contaminants could be accepted at several landfills in the Duluth area unless extremely high contaminant levels are encountered.

Groundwater impacts remaining following closure of the petroleum leak site were considered restricted to the leak site and the associated plume was considered to be stable or degrading. Mobilization of contaminants could occur if dewatering or excavation activities during construction were undertaken immediately around the former leak site. Contractors will be kept aware of the site conditions throughout the project in order to reduce the potential for re-mobilization. Water removed as a result of dewatering operations or from excavations would be field screened to identify potential impacts; contaminated water encountered would be sampled and tested at an analytical laboratory to allow for proper disposal to occur. In the event that

contamination is discovered, the State Duty Officer will be notified, in accordance to the reporting requirements of Minnesota Statutes chapter 115.061.

In October 2012, three sediment samples were collected from the project area to evaluate the potential for encountering elevated contaminant concentrations related to dredging during construction. Samples were collected from the upper 18 inches of the sediments from three locations (Sites 1, 3 and 6) as shown on **Figure 3-2**. Since the samples collected were dominantly sands, they were analyzed only for the parameters listed in **Table 3-6**, which are the suite of analytes identified for testing per the document “Managing Dredged Materials in the State of Minnesota” (MPCA 2009).

In the State of Minnesota dredged materials are managed according to the contaminant concentration present. There are three Management Levels established by the MPCA, which are defined as follows:

- **Level 1** – Represents the most restrictive standard. Soils that contain contaminant concentrations less than the Level 1 Soil Reference Values (SRV) are considered acceptable for reuse on properties with a residential or recreational use designation.
- **Level 2** – Represents a less restrictive standard than Level 1. Soils that contain contaminant concentrations less than the Level 2, but greater than Level 1, have SRV considered acceptable for reuse on properties with an industrial use designation.
- **Level 3** – Represents the least restrictive standard, for soils containing significant concentrations of contaminants. Soils containing contaminant concentrations greater than Level 2 SRV are evaluated on a case-by-case basis to determine how they can be appropriately managed to control for the risk of exposure to human health and the environment.

In **Table 3-6** the contaminant concentrations measured in the three analyses have been compared to the Level 1 SRV. This comparison shows that all of the measured concentrations are less than the SRV for each parameter. The sampling and analyses conducted were completed as a screening mechanism to evaluate the potential for encountering contaminated materials. The locations and number of samples/analyses required prior to construction to comply with the guidelines provided in the document “Managing Dredged Materials in the State of Minnesota” (MPCA 2009) will depend on the alternative selected and the volume of sediment to be dredged.

**Table 3-6
Contaminant Concentrations**

Parameter	Units	Level 1 Soil Reference Value (SRV)	Sample #1	Sample #3	Sample #6
Arsenic	mg/kg	9	3.9	3.4	5.8
Cadmium	mg/kg	25	0.36	0.35	0.55
Chromium III	mg/kg	44,000	3.7	5	8.2
Chromium VI	mg/kg	87	ND	ND	ND
Copper	mg/kg	100	2.2	3.1	6.1
Lead	mg/kg	300	2.5	2.1	3.4
Mercury	mg/kg	0.5	ND	ND	ND
Nickel	mg/kg	560	2.9	4	7.6
Selenium	mg/kg	160	ND	ND	ND
Zinc	mg/kg	8,700	7.9	8.2	20
Total Phosphorous	mg/kg	NA	156	110	254
Nitrate + Nitrite	mg/kg	NA	ND	ND	ND
Ammonia-Nitrogen	mg/kg	NA	ND	ND	48.5
Total Kjeldahl Nitrogen	mg/kg	NA	ND	ND	413
Total PCBs	mg/kg	1.2	ND	ND	ND
Total Organic Carbon	mg/kg	NA	501	766	11,300

Any removal of sediments required for construction is unlikely to encounter contamination from the petroleum leak sites above MPCA action levels. Due to the high water table resulting from the presence of Superior Bay and Lake Superior, any necessary dredging activities conducted for construction are unlikely to cause changes in groundwater flow conditions near the closed petroleum leak site; therefore, no further mobilization of the contaminants or increased impacts to receptors are likely.

Alternative 13

The implementation of Alternative 13 would not result in any change in fueling use or spill protection. The construction limits of Alternative 13 do not impact the closed petroleum leak site, however the current extent of residual contamination is not known. Activities related to runway realignment are not expected to encounter contaminated soils, but this potential does exist. During excavation activities in that area environmental screening of soils would be conducted by trained personnel using a PID to identify soils potentially impacted by petroleum contaminants. Any impacted soils would be segregated from other soils in a containment area, placed on 10 mm polyethylene plastic and covered with 10 mm plastic to prevent infiltration of precipitation and dispersal of the contaminated soils. Soils identified as potentially impacted would be sampled and analyzed in accordance with MPCA guidance documents to allow characterization prior to disposal. Soils characterized as being impacted by petroleum contaminants could be accepted at several landfills in the Duluth area unless extremely high contaminant levels are encountered.

Groundwater impacts remaining following closure of the petroleum leak site were considered restricted to the leak site and the associated plume was considered to be stable or degrading. Mobilization of contaminants could occur if dewatering or excavation activities during construction were undertaken immediately around the former leak site. Contractors will be kept aware of the site conditions throughout the project in order to reduce the potential for re-mobilization. Water removed as a result of dewatering operations or from

contains a high water table that is potentiometrically dependent on Lake Superior. This makes groundwater in the project area highly susceptible to contamination.

Standard policies are employed at the Airport to minimize the potential for contamination. The aboveground tank and fuel system are subject to routine monitoring and reporting including daily, monthly, and quarterly inspections. Required SPCC plan inspections are also conducted and inspections and fuel safety activities are recorded as required.

3.11.3.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

The preliminary preferred alternative would not result in any change in fueling use or spill protection and would not result in impacts to sinkholes, shallow limestone formations, or karst conditions.

Alternative 13

The implementation of Alternative 13 would not result in any change in fueling use or spill protection and would not result in impacts to sinkholes, shallow limestone formations, or karst conditions.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility, which would ultimately result in the removal of the five aboveground storage tanks currently present at the Airport. Proper decommissioning of these tanks should result in no adverse environmental consequences at the site. The no action alternative would not result in impacts to sinkholes, shallow limestone formations, or karst conditions.

3.11.4 Soil Conditions (*EAW Item 10.b.*)

EAW Item 10.b. Soils and Topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 11.b.ii.

A review of the 2012 NRCS Web Soil Survey for St. Louis County indicates three different soil types in the project area (**Figure 3-10**): loamy Udifluvents (0-2% slopes) 1026A, sandy urban land complex Udipsamments (1-20% slopes) F157C, and sandy Udipsamments (4-20% slopes) F171D.

As noted above, Minnesota Point is predominantly underlain with highly permeable and sandy soils and contains a high water table that is potentiometrically dependent on Lake Superior. This makes groundwater in the project area highly susceptible to contamination. .

3.11.4.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Construction activities will occur on the Udipsamments with the majority of the work located on the urban land complex Udipsamment F157C. This soil consists of excessively drained, loamy sand, with the potential to transmit water at 2 to 20 inches per hour. The drainage properties of this soil make it susceptible to groundwater contamination. A construction SWPPP will address preventative contamination measures and spill kits will be available as part of this plan during construction (see **Section 3.4**).

The approach for Runway 14 is partially located over the loamy Udifluvents 1026A, but construction activities will not occur on this area.

Following project completion, site runoff will be directed to the onsite stormwater treatment system prior to entering groundwater or discharging to surrounding water bodies as part of the NPDES permit required for the site. Stormwater runoff on site is currently managed through vegetative swales parallel to the existing runway, taxiway, and other impervious surfaces. The current fueling facilities will not be altered in this project and are subject to routine monitoring and reporting including daily, monthly and quarterly inspections. Required SPCC plan inspections are also conducted and inspections and fuel safety activities are recorded as required.

Alternative 13

Similar to Alternative 5a Short, construction activities will occur on the Udipsamments with the majority of the work located on the urban land complex Udipsamment F157C. This soil consists of excessively drained, loamy sand, with the potential to transmit water at 2 to 20 inches per hour. The drainage properties of this soil make it susceptible to groundwater contamination. A construction SWPPP will address preventative contamination measures and spill kits will be available as part of this plan during construction (See **Section 3.5.2.1**).

The approach for Runway 14 is partially located over the loamy Udifluvents 1026A, but construction activities will not occur on this area.

The current fueling facilities will not be altered in this project and are subject to routine monitoring and reporting including daily, monthly and quarterly inspections. Required SPCC plan inspections are also conducted and inspections and fuel safety activities are recorded as required.

No Action

The no action alternative results in Airport closure and removal of all airport facilities. Construction activities for the no action alternative would occur on the urban land complex Udipsamment F157C. A construction SWPPP will address preventative contamination measures and spill kits will be available as part of any plan that would be required for decommissioning and removing airport facilities (see **Section 3.5.2.1**).

3.12 Historical, Architectural, Archeological, and Cultural Resources (EAW Item 14)

***EAW Item 14.** Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties.*

The National Historic Preservation Act (NHPA) of 1966, as amended, establishes the Advisory Council on Historic Preservation (ACHP) and the National Register of Historic Places (NRHP). Section 106 of the NHPA requires consideration of the effects of undertaking on properties on or eligible for inclusion in the NRHP. Compliance with Section 106 requires consultation the State Historic Preservation Officer (SHPO) if there is a potential adverse effect to historic properties on or eligible for listing on the NRHP.

The Area of Potential Effect (APE) is that area upon which the project has the potential to generate effect, either directly or indirectly. Belowground archaeological resources could be affected where the project would include physical ground-disturbing activities. Architectural and historical aboveground resources could be affected where increases in levels of noise, changes in visual or aesthetic qualities, or changes in traffic

densities or patterns would occur. The Area of Potential Effect (APE) is considered to include the full width of the Point at the Airport and extending both northwest and southeast from the existing runway as shown on Figure 3 in the Cultural Resources Review report (**Appendix I-2, Figure 3**). Results of tribal consultation, as well as input from the Technical Advisory Committee, indicated that there is a high potential for tribal and cultural resources on site.

A cultural resources review was conducted by Duluth Archaeology of Duluth, Minnesota as part of the Environmental Assessment Scoping Document (see **Appendix D**). The 2008 literature search and records review considered historic properties including standing structures, Traditional Cultural Properties (TCPs) and sacred/religious sites. The study also reviewed known archeological sites in the area.

The 2008 study (**Appendix I-3**) indicated that the existing airport location has not been surveyed for archeological sites. However, a recorded archeological site exists southeast of the Airport (adjacent and west of the Minnesota Point Lighthouse, which is on the NRHP) and has been identified in the SHPO database as a Native American campsite and cemetery. This suggests potential for additional unrecorded sites within the project area. In addition, the 2008 study included accounts from an elder of the Fond du Lac Band of Lake Superior Chippewa, photographs, and accounts of early settlement from pioneer settlers indicate occupation of Minnesota Point by Native Americans. Potential for burial sites also exists near the APE as indicated by an elder from the Fond du Lac Band, in information relayed to Duluth Archaeology by LeRoy Defoe, Cultural Resources Specialist for the Fond du Lac Band.

In conjunction with the cultural resources review, Duluth Archaeology completed a Phase I archaeological survey of the project area (**Appendix I-2**). The Phase I survey was conducted because the project area has a high potential for intact subsurface archeological deposits and burials. The Phase I survey included pedestrian walkover with shovel testing where permitted (no shovel testing was permitted within the SNA or within property owned by SWLP). The survey identified six possible cabin locations identified by brick piles, cement slabs, capped well pipes, and artifact scatters. A dump was also presumed to be associated with use of the cabins. No indication of Native American sites or burials was observed.

There are two structures on Minnesota Point that are listed on the NRHP, the Minnesota Point Lighthouse and the U.S.S. Essex Shipwreck (see **Figure 3-11**). These sites are located approximately 1.0 miles and approximately 0.6 miles, respectively, from the existing Runway 32 end. The Pine Knot Cabin, a recreational cabin, once stood within the southernmost parcel of the Minnesota Pine Forest SNA and within the APE, but was removed by the MNDNR in November and December 2010.

None of the existing structures on airport property are over 50 years old. The oldest hangars (Hangars 2, 3, and 4) were constructed in 1969 and the terminal building was constructed in the 1970s.

3.12.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

There are no properties within the APE eligible for listing on the NRHP. This alternative does not include ground disturbance in the vicinity of the possible cabin locations identified in the Phase I survey. Therefore, Alternative 5a Short would not result in any adverse impact to cultural resources. Installation of the previously proposed southernmost obstruction light could potentially impact the dump identified in the Phase I survey. Installation of the southernmost new obstruction light was eliminated from the preliminary preferred alternative to avoid impacts to cultural and other resources in the area. If the second new obstruction light is required for safety reasons, a Phase II archaeological survey will be conducted to delineate the boundaries of the archaeological site. A Phase III recovery survey would be conducted if necessary based on the location of the archaeological site.

The sites (positive shovel tests) identified during the Phase I survey will be protected from disturbance during construction. The FAA issued a finding of No Historic Properties Affected in August, 2011. The SHPO conditionally concurred with the finding in a letter dated September 8, 2011. The FAA revised the finding to incorporate SHPO's conditions and to reflect new information. The FAA issued a revised finding in July 2014. Results of the consultation will be included in the Final EA.

In the event that cultural or archaeological resources are discovered during construction, all work will stop until the Airport notifies SHPO and the FAA Minneapolis Airports District Office (MSP-ADO). The Airport shall protect the area until cultural/archaeological resource concerns have been appropriately addressed, and the Airport shall take action to comply with the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act, as appropriate.

Alternative 13

There are no properties within the APE eligible for listing on the NRHP. This alternative includes ground disturbance in the vicinity of positive shovel tests (shovel test locations 6 and 2, **Appendix I-2, Figure 5**). This general area will be disturbed during installation of the new obstruction light (see **Figure 2-12**). As originally proposed, a second new obstruction light would have also had potential for impacts, but the second new light was eliminated from Alternative 13 in order to minimize impacts to cultural and other resources. A Phase II archeological survey will be completed prior to construction and identified sites protected from disturbance. A Phase III recovery survey would be conducted if necessary based on the location of the archaeological site. Alternative 13 was included in the August 2011 finding of No Historic Properties Affected and revised July 2014 finding. Results of the consultation will be included in the Final EA. If Alternative 13 is selected, additional coordination will be completed as required.

In the event that cultural resources are discovered during construction, all work will stop until the Airport notifies SHPO and the FAA MSP-ADO. The Airport shall protect the area until cultural resource concerns have been appropriately addressed, and the Airport shall take action to comply with the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act, as appropriate.

No Action

The no action alternative would result in loss of Airport licensure and closure and removal of the facility. Prior to implementation, an architectural history survey of the Airport would be required. Existing hangar structures at the Airport vary in age from 13 years to over 43 years old. The removal of airport facilities may result in work in the vicinity of positive shovel tests (shovel test locations 2, 6 and 12, **Appendix I-2, Figure 5**). In addition, the closure of the Airport would require a land release from the FAA releasing the DAA from the federal obligations associated with the site. The land release would end federal control of the site and may result in an Adverse Effect. A Phase II archeological survey would be completed prior to construction and identified sites protected from disturbance. Additional consultation with the SHPO would be required.

In the event that cultural resources are discovered during construction, all work will stop until the Airport notifies SHPO and the FAA MSP-ADO. The Airport shall protect the area until cultural resource concerns have been appropriately addressed, and the Airport shall take action to comply with the National Historic Preservation Act, the Native American Graves Protection and Repatriation Act, and the Archaeological Resources Protection Act, as appropriate.

3.13 Light Emissions and Visual Impacts

3.13.1 Scenic Views and Vistas (*EAW Item 15*)

EAW Item 15. Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

Duluth-Sky Harbor Airport is located between Lake Superior to the east and Superior Bay to the west on Minnesota Point, which makes up one of largest, natural freshwater baymouth sandbars in the world (Ojakangas and Match 1982). The Airport's location between both Lake Superior and Superior Bay makes it uniquely positioned so that from nearly any vantage point on the Airport property, there are broad, and often spectacular, scenic views and vistas in most directions. These views include the City of Duluth skyline; Lake Superior and Superior Bay; the Duluth and Superior harbors and major inland port facilities; the City of Superior to the immediate west across Superior Bay; and the sand dune and old-growth forest plant communities (including within and nearby the SNA) on Minnesota Point surrounding most of the Airport. These views and vistas are not officially designated or marked, but do have local and regional interest. The old-growth forest is specially designated by the MNDNR as a "Site of Biodiversity Significance." Minnesota Point is not officially designated as a unique geological feature, but it is recognized by both the regulatory, scientific, and lay community as a unique resource for its position as one of the world's largest freshwater baymouth sandbars.

3.13.1.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

The preliminary preferred alternative includes relocating the runway from the existing location but will not impact scenic views and vistas to or from Minnesota Point. Two obstruction lights would be abandoned and one new obstruction light would be installed. Bulbs would be removed from the abandoned obstruction lights, but the structures would remain in place to avoid ground disturbance caused by their removal. The new and existing obstruction lights would blend with the existing tree line. Therefore, the obstruction lights would be visible but would not have a significant effect on the view from Minnesota Point or to Minnesota Point from other areas. No new buildings or other infrastructure are planned that could potentially impede any scenic views or vistas.

Alternative 13

In Alternative 13 the runway will be relocated from the existing condition, but will not impact scenic views and vistas to or from Minnesota Point. The two southernmost obstruction lights would be abandoned (similar to the preliminary preferred alternative), and one new obstruction light would be installed on DAA property. As with the current location of the obstruction lights, they would blend with the existing forest. As with the preliminary preferred alternative above, the obstruction lights would be visible but would not have a significant effect on the view from Minnesota Point or to Minnesota Point from other areas. No new buildings or other infrastructure is planned that could potentially impede any scenic views or vistas.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. The removal of airport facilities would allow views of the Duluth skyline and harbor from additional vantage points at the existing airport, and would allow additional views of the old-growth forest (including of the SNA) from additional areas on Minnesota Point and the existing airport. If the Airport were to close, the area would be rededicated as a public recreational area. It is not known what land use would be associated with this recreational area. It is unknown if some eventual uses of the site in the no action alternative would have visual effects in the future.

3.13.2 Light Emissions and Visual Impacts (EAW Item 15)

EAW Item 15. Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The major sources of light emissions at the Airport include exterior lighting on the terminal buildings, the Airport beacon, parking lot lighting, and runway and navigational lights (including obstruction lights).

Runway 14/32 is equipped with MIRLs that outline the edges of runway during periods of darkness or restricted visibility conditions. The parallel taxiway has MITLs.

Additional lighting at the Airport consists of REILs, PAPIs, and threshold lights all of which give off light emissions. The REILs mark the ends of the runways and consist of two synchronized flashing lights, one on each side of the runway threshold, facing the approach area. PAPIs provide pilots with visual glide slope guidance during approach for landing by presentation of a color-coded indication of the approach aircraft's position on the glide path. Threshold lights mark the runway ends and consist of a red light to indicate the end of the runway to a departing aircraft and emit green outward from the runway end to indicate the threshold to landing aircraft.

The runway and approach guidance lights (PAPIs and REILs) are pilot-controlled-lighting systems. Lights are not illuminated continuously at night or during adverse weather. The lighting systems are initiated by individual pilots as needed for night operations or operations under limited visibility. Once initiated by a pilot, the lights remain illuminated for a 15-minute period and then are extinguished automatically.

The four existing obstruction lights (see **Figure 1-2**) are lit continuously to alert pilots of the trees penetrating the existing approach surface. The obstruction light structures vary in height from 75 feet to 79 feet and are visible to individuals on airport property, traversing the trail in the SNA at various locations, and from Superior Bay. The lights are illuminated upwards and are visible from both the sky and the ground level. The Airport beacon is lit during periods of darkness or inclement weather and is illuminated upward towards the sky.

3.13.2.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short would include replacement of existing lighting on the reconstructed runway. The lighting would include MIRLs, MITLs, PAPIs, and REILs. Two obstruction lights would be abandoned and one new obstruction light would be installed. The two abandoned obstruction lights would no longer be illuminated, but the poles will remain in order to avoid ground disturbance associated with their removal. The proposed obstruction light would be installed to provide only upward illumination in order to notify pilots of the edge of the forest community and the associated obstructions within the transitional surface. Since the illumination would be directed upward, it will not illuminate the surrounding forest and will minimize effects to wildlife in the forest. Because the reconstructed runway would be of shorter length than the existing runway there would be a net decrease in airport lighting. Construction activities for this alternative would not use lighting during periods of darkness.

The proposed construction would not be visible from Lake Superior.

Alternative 13

Similar to Alternative 5a Short, Alternative 13 would include replacement of existing lighting on the reconstructed runway. The lighting would include MIRLS, MITLS, PAPIs and REILs. The two southernmost existing obstruction lights would be removed, and one new obstruction light would be installed. The proposed obstruction light would be installed to provide only upward illumination in order to notify pilots of the edge of the forest community and the associated obstructions within the transitional surface. Since the illumination would be directed upward, it will not illuminate the surrounding forest and will minimize effects to wildlife in the forest. Because the reconstructed runway would be of shorter length than the existing runway there would be a net decrease in airport lighting. Construction activities for this alternative would not use lighting during periods of darkness.

The proposed construction would not be visible from Lake Superior.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. The removal of airport facilities including all associated lighting would reduce the light emissions at the Airport site. Construction (removal of airport facilities) would not include the use of lights during periods of darkness and would not be visible from Lake Superior.

3.14 Noise

FAA Orders 1050.1E and 5050.4B as well as FAA 14 CFR Part 150 provide the guidance for determining airport noise impacts. Noise is measured by the Day-Night Sound Level (DNL). It is the logarithmic average of sound levels in decibels and is based on a 24-hour Equivalent Sound Level (Leq). DNL values incorporate a 10-decibel penalty for noise events occurring between 10:00 PM and 7:00 AM to account for increased noise sensitivity at night. The FAA considers a noise impact would be significant if an action would cause noise sensitive areas to experience an increase in noise of DNL 1.5 dB or more at or above DNL 65 dB noise exposure when compared to the no action alternative for the same timeframe. Sensitive areas include residential, school, hospital, day care, and retirement home uses.

In accordance with the guidelines set forth in FAA Order 5050.4B, Chapter 5, Paragraph 47e, Section (1), a noise analysis is not required for proposed development options at airports where existing or forecast operation levels do not exceed 90,000 annual propeller operations or 700 annual jet operations. These numbers of propeller or jet aircraft operations result in cumulative noise levels not exceeding 60 DNL more than 5,500 feet from start of takeoff roll or 65 DNL on the runway itself. Therefore, impacts in excess of these noise levels are not expected outside of the Airport property limits.

It is estimated that the existing (2011) approximately 13,900 annual operations are all propeller operations. No jet operations are currently reported at the Airport. These operations numbers are under the threshold requiring a noise analysis. Because both the anticipated jet and propeller operations are below the threshold requiring a noise analysis, it is concluded that noise impacts do not occur outside of the Airport property limits and do not adversely affect surrounding land uses. Annual operations are expected to remain consistent around 13,900 annual operations according to the FAA Terminal Area Forecasts [Fiscal Year (FY) 2011-2032], remaining below the threshold requiring a noise analysis and below noise levels that could be expected to adversely affect surrounding land uses.

3.14.1 Environmental Consequences**Preliminary Preferred Alternative: Alternative 5a Short**

Alternative 5a Short would not directly result in any substantial change in the number of aircraft operations or the type of aircraft using the Airport and would not directly contribute to a change or increase in noise generation at the Airport.

Alternative 13

Alternative 13 would not directly result in any substantial change in the number of aircraft operations or the type of aircraft using the Airport and would not directly contribute to a change or increase in noise generation at the Airport.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. Airport closure would remove aviation use and the associated noise and result in a decrease in noise in the immediate area.

3.15 Socio-Economic Conditions, Environmental Justice and Children's Environmental Health and Safety Risks**3.15.1 Socioeconomic Impacts****3.15.1.1 Demographics and Socioeconomics Conditions**

The City of Duluth is located in northeastern Minnesota, in St. Louis County. The United States Census reports that in 2010 there were approximately 200,226 residents in St. Louis County with 102,931 residents in the labor force. Unemployment in the year 2010 was estimated at 5.0%. The St. Louis County unemployment rate has been consistently above the state average of 2.9% in 2000 and 4.5% in 2010. Per capita income in St. Louis County was \$25,014 in 2010, which is approximately 16 percent below the state average of \$29,582.

The City of Duluth population, according to the U.S. Census, has remained relatively stable with an estimated 2010 population of 86,265 people and a 2000 estimated population of 86,918 people. The unemployment rate in Duluth has remained above both the county and state rates. The Duluth unemployment was 4.8% in 2000 (compared to county unemployment of 4.3% and state unemployment of 2.9%) and 5.3% in 2010 (compared to county unemployment of 5.0% and state unemployment of 4.5%). The per capita income in Duluth for 2010 was \$23,845, below the county-wide average of \$25,014 and the state-wide average of \$29,582.

3.15.1.2 Airport Economic Impact

MnDOT Aeronautics provides airport sponsors with an Economic Impact Calculator, which estimates the economic impact of general aviation airports in Minnesota. The calculator was developed by the University of Minnesota, Department of Applied Economics and the North Central Research and Outreach Center in 2005 and updated in 2010. The calculator measures the change or additional money and jobs at the county level that has been created as a result of the current economic activity taking place at the Airport. This includes direct, indirect, and induced effects. The DAA used the Economic Impact Calculator in 2010 and 2012 to determine an estimate of the Airport's economic contribution to the local and state economy.

The results of the 2010 study (which utilized 2009 data and the Economic Impact Calculator developed in 2005) indicated that Duluth-Sky Harbor Airport contributed \$1.67 million in sales, supported 52 jobs, and contributed \$627,000 in wage income to the local and state economy in 2009.

The DAA completed an update of the economic impact analysis using data from January 2012 through September 2012 (9 months). The calculator was revised and updated by the University of Minnesota in 2010 to reflect changes in the economy since 2005, and thus is a different model than what was used to analyze the

2009 data. This update estimated that the total economic impact of the Airport during the 9-month period to be over \$1.5 million and over 28 jobs. Business use of the Airport was estimated to account for over \$500,000 of the total revenue and for over 12 of the total jobs. Overnight use by general aviation pilots and other visitors of the Airport during the 9-month period accounted for over \$580,000 of the total revenue and supported over 10 of the total jobs. The remaining economic impact from the 9-month estimate results from the economic impact of airport ownership and the economic impact of non-profit and government entities at the Airport.

3.15.1.3 Environmental Consequences

Social impacts are judged as significant if they cause the relocation of any resident or business, alteration of surface transportation patterns, division or disruption of established communities, disruption of orderly, planned development, or an appreciable change in employment.

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short would not result in the relocation of any residences or businesses or the alteration of surface transportation patterns, division or disruption of established communities, disruption of orderly, planned development, or an appreciable change in employment. Alternative 5a Short has the beneficial impact of allowing the Airport to continue operations, preserving 28 jobs and positive economic impact to the local economy.

Alternative 13

Alternative 13 would not result in the relocation of any residences or businesses or the alteration of surface transportation patterns, division or disruption of established communities, disruption of orderly, planned development, or an appreciable change in employment. Alternative 13 has the beneficial impact of allowing the Airport to continue operations, preserving 28 jobs and positive economic impact to the local economy.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. Closure of the Airport would result in relocation of 23 based aircraft as well as the closure and possible relocation of two (2) businesses (Jonathan Aero and Hangar 10 Aero). Jonathan Aero's business has one employee and includes changing aircraft landing gear from wheeled/ski landing gear in the spring to float gear and from float gear to wheeled/ski gear in the fall. This portion of the business requires an airport with both water and land based landing facilities, none of which exist in the immediate Duluth area. The closest airport with these facilities is located in Tower, MN, approximately 2 hours from Duluth-Sky Harbor Airport. No existing space is available at the Tower airport for construction of a replacement hangar for this business. However, the approved Airport Layout Plan for the Tower Airport includes a future building area that, once constructed (projected construction in 2016), could accommodate an additional hangar for this business.

Hangar 10 Aero's business has two employees and focuses primarily on the growing new Light Sport Aircraft market. Their business serves primarily wheeled-based aircraft and could thus be relocated to an airport with only a paved landing surface. The closest airports with the needed facilities are the Duluth International Airport and Richard I. Bong Superior Airport. Adequate space is available at these airports to accommodate Hangar 10 Aero's needs.

Based wheeled and amphibious aircraft could be relocated to Duluth International Airport or Richard I. Bong Superior Airport. Aircraft could also relocate to Cloquet/Carlton County Airport (28 miles from Duluth-Sky Harbor Airport) or Richard B. Helgeson Airport in Two Harbors, MN (33 miles from Duluth-Sky Harbor Airport). Float based aircraft would require relocation to an airport with a water-based landing facility. The closest such facility is located in Tower, MN.

The no action alternative would result in the relocation of one residence, which is located within the Airport terminal building. The residence is owned by the DAA and rented to an employee. Comparable, available, replacement housing units are available in the Duluth area. The project-related relocation to a comparable neighborhood in the Duluth area is not expected to cause a negative effect on an established neighborhood. The relocation would not cause an unacceptable increase in service demands to the comparable neighborhood.

The one residence, two businesses, hangar owners, and based aircraft owners would be relocated along with the assistance and services required according to the Uniform Relocation Assistance and Real Property Acquisition Policies Act, and 49 CFR Part 24 (Implementing the Uniform Relocation Assistance and Real Property Acquisition Policies Act) and FAA Order 5100.37B, Land Acquisition and Relocation Assistance.

Based on the economic impact study described in **Section 3.15.1.2**, this alternative would contribute to the potential loss of over 28 jobs to the county. While some airport users may choose to relocate to other airports in the vicinity including Duluth International Airport or Richard I. Bong Superior Airport in Superior, WI, the closure of Duluth-Sky Harbor Airport would result in the loss of the economic impact of the Airport (up to \$1.5 million over a 9-month period) to the local economy. As described in **Section 2.2**, the estimated total implementation cost of the no action alternative is approximately \$8.0 million. This cost does not include buy-outs of leases currently held by airport tenants. Expenditures of this amount could impact the DAA's budget for and ability to operate and maintain the Duluth International Airport at current levels.

3.15.2 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, dated February 11, 1994, requires each federal agency to achieve environmental justice as part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

The one-mile buffer area (by land) of the existing airport includes Census Tract 22, St. Louis County, Minnesota. The City of Duluth has a slightly higher percent minority population than the immediate project area (Census Tract 22) while St. Louis County's percent minority population is similar to the immediate project area. The following table identifies their ethnic characteristics for the immediate project area (Census Tract 22), the City of Duluth, and St. Louis County. The largest minority group living in the City of Duluth is individuals of two or more races followed by American Indian/Alaska Native and African American. The largest minority group living in St. Louis County are people of two or more races followed by African American and American Indian/Alaska Native.

The demographics for Census Tract 22, City of Duluth, and St. Louis County are shown in **Table 3-7**.

**Table 3-7
2010 Census Data**

Ethnicity	Census Tract 22	City of Duluth (% of population)	St. Louis County (% of population)
White	93.3	90.492	93.0
African American	2.0	2.3	1.4
American Indian and Alaska Native	0.9	2.5	2.2
Asian	1.6	1.5	0.9
Native Hawaiian and Other Pacific Islander	0.0	0.0	0.0
Some other race	0.0	0.3	0.2
Two or more races	0.0	3.0	2.3
Total Population	1,282	86,265	200,226

Source: 2010 U.S. Census

The median household income (MHI) for the Census Tract in the immediate project area, according to the 2010 Census, is \$60,208 (Tract 22). This is higher than the MHI for St. Louis County and the City of Duluth. There is a lower percentage of persons living in poverty in Census Tract 22 (4%) than the City of Duluth (15%) and the State of Minnesota (11%). The socioeconomics for these Census areas are shown in **Table 3-8**.

**Table 3-8
Demographics for Duluth, St. Louis County, and Local Census Tract
(2010 Census)**

	Duluth	St. Louis County	Census Tract 22
Total population	86,265	200,226	1,282
Median Household Income	\$41,092	\$44,941	\$60,208
% Persons Below Poverty Level	15% (Duluth, MN-WI Metro Area)	16%	4%

Source: 2010 U.S. Census

3.15.2.2 Environmental Consequences

In determining the disproportionate nature of high and adverse impacts resulting from the alternatives, the first step in the process is to determine whether the impact will be predominately borne by minority and/or low-income populations. The census data present above along with field observations and direct contacts with local government officials were used to assist in determining if there are any readily identifiable minority and/or low-income populations living in close geographic proximity to the project area.

According to the 2010 census data there are slightly fewer persons living in poverty within the City of Duluth (15%) than St. Louis County as a whole (16%). Furthermore, the area surrounding the Airport (Tract 22) has a lower percentage of individuals living in poverty (4%) than the City of Duluth, St. Louis County, and the Minnesota State Average (11%).

The project area (Census Tract 22) has a similar minority population to St. Louis County and a slightly lower minority population than the City of Duluth. The project area also has a slightly higher Asian population than the City of Duluth (0.6% compared to 0.5%). However, the census tract is much larger than the project area and the existence of any minority populations existing in the immediate area of the Airport could not be determined from the census data alone. No readily identifiable minority populations were noted during field observations and during contacts with local government officials.

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short would not result in property acquisition or displacement of any residents and would not result in incompatible land uses or adverse noise impacts off of airport property, so there would be no disproportionate impacts to any minority or low income populations.

Alternative 13

This alternative would have the same potential effects as Alternative 5a Short. Therefore, Alternative 13 would not result in disproportionate impacts to any minority or low income populations.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. This alternative would result in the relocation of one resident who currently resides at the Airport, but would not result in any property acquisition or incompatible land uses or adverse noise impacts off of airport property. The no action alternative would not result in any disproportionate impacts to any minority or low income populations.

3.15.2.3 Environmental Justice Determination

Based on consideration of the information described above it is reasonable to conclude that the project area contains no readily identifiable minority and/or low-income populations. Therefore, as defined by EO 12898 and based upon the data presented above, the improvements associated with the Duluth-Sky Harbor Airport project will not result in disproportionately high or adverse effects to minority and/or low-income populations.

3.15.3 Children's Environmental Health and Safety Risks**3.15.3.1 Environmental Consequences**

Environmental health risks and safety risks include risks to health or safety that are attributable to products or substances that a child is likely to come in contact with or ingest, such as air, food, drinking water, recreational waters, soil, or products to which they might use or be exposed.

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short would result in no changes to these substances, nor would this alternative result in additional exposure of these substances to children.

Alternative 13

Alternative 13 would result in no changes to these substances, nor would Alternative 13 result in additional exposure of these substances to children.

No Action

The no action alternative would result in loss of Airport licensure and closure and removal of the facility. A Phase I and II Hazardous Material Site assessment would be required prior to implementation of the no action alternative. At this time are no known sites requiring clean-up or remediation in the area. Any areas determined to need environmental clean-up would be completed in a manner that would allow the site to be reclaimed for use as a public recreational area. This includes meeting health and safety standards applicable for the site to be used by children as part of the general public. The project area would be remediated to a level acceptable for use as a public recreational area, and thus acceptable to children's health based on that planned use.

3.15.4 Secondary (Induced) Impacts

3.15.4.1 Environmental Consequences

Secondary or indirect impacts involve shifts in population, changes in business and economic activities and climate, or shifts in levels of public service demand.

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short would not result in any shifts in population, changes in economic climate, or shifts in levels of public service demand. The preliminary preferred alternative would support the existing businesses at the Airport, but would not be expected to directly contribute to any new or additional commercial or industrial development.

Alternative 13

Similar to Alternative 5a Short, Alternative 13 would not result in any shifts in population, changes in economic climate, or shifts in levels of public service demand. Alternative 13 would support the existing businesses at the Airport, but would not be expected to directly contribute to any new or additional commercial or industrial development.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. The closure of the Airport would result in the relocation of 23 based aircraft and two (2) businesses. These airport users would presumably increase the demand for aviation services and hangar space at nearby airports (Duluth International Airport, Richard I. Bong Memorial Airport in Superior, WI, as well as potentially Richard B. Helgeson Airport in Two Harbors, MN and the Cloquet/Carlton County Airport in Cloquet, MN). Relocation assistance would be available for business and hangar owners (see **Section 3.15.1.3**). In addition, the Airport closure would result in a loss of the current positive economic impact the Airport has on the local economy as described in **Section 3.15.1.2**.

3.16 Water Quality

3.16.1 Surface Water Resources (*EAW Item 11.a.i. and 11.b.iv.*)

EAW Item 11.a.i. Surface water features on or near the site. Describe lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any: Lake Superior (16-1P)

EAW Item 11.b.iv. Surface water effects and minimization and mitigation measures. Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the page 6 water features. Discuss how the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.

The MNDNR Public Waters Inventory lists Lake Superior and Superior Bay (16-1P), as well as the St. Louis River, as Public Waters. Habitat within the harbor near the Airport is primarily shallow to deep sluggish and tannin-stained water. Bottom composition is soft sediments and sand. Aquatic vegetation, hard substrates, and cover are generally lacking in the immediate project area, but are present within the harbor, river, and tributary streams. The bay supports a warm water fishery comprised of species including walleye, yellow perch, sauger (*Sander canadense*), northern pike (*Esox lucius*), and panfish (Centrarchids). See **Section 3.2.1.2** for more details on aquatic habitats in Superior Bay.

3.16.1.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short includes filling in Superior Bay in order to construct the proposed runway.

Approximately 69,800 cubic yards of fill over 7.49 acres would be placed in Superior Bay to accommodate the runway construction and establishment of the RSA to FAA standards¹³. This includes 37,600 cubic yards of fill placed below the water line and 32,200 cubic yards of fill placed above the water line (See **Figure 2-3**). Including fill material placed in the water and on existing land, approximately 74,650 cubic yards of material are estimated to be needed for construction. In addition, approximately 50,000 cubic yards of surcharge (fill to be placed in order to compact soft soils, and then removed) are required. After the surcharge period, some surcharge material will be able to be used on site for grading. Excess surcharge will be removed and reused on site within the project limits after the surcharge period. Disposal of all excess surcharge material will be conducted in accordance with all applicable local, state, and federal regulations.

Approximately 65,000 cubic yards of material will be obtained from on site excavation in the area of the existing runway and taxiway. These materials may be reused in construction of the embankment surcharge depending on material type and quality. All soil types would qualify as surcharge material provided there is no debris or organics present. Soil types that may be used for the surcharge may be generally classified as gravel, sand, silt and clay or combinations thereof. Granular fill material used for embankment construction and surcharge may come from Erie Pier located six miles by water and approximately nine miles by road from the project site. This site is controlled by the Duluth Seaway Port Authority. This site includes washed sand that is suitable for use as granular or select borrow. Erie Pier also contains fine-grained material that would not be suitable for use in portions of the embankment. Discussions with the Port Authority indicate they prefer material from Erie Pier or material slated to be deposited at Erie Pier be used since it would address space concern at the site. The second potential source is from the annual dredging program conducted by the U.S. Army Corps of Engineers. The annual dredge program produces approximately 100,000 cubic yards of fill material. However, this material does not always consist of sand; therefore, it may not be suitable for use beneath the runway but could be used for surcharged fill or in zoned areas of the embankment that do

¹³ FAA Advisory Circular 150/5300-13, Paragraph 305 and Table3-1.

not support the runway or taxiway. There are also stockpiles of materials at privately owned piers within the harbor.

The materials used for runway construction will likely be brought to the project site using a combination of trucking and hydraulic pumping depending on material type and source. The primary borrow site for fill material is anticipated to be an established, existing site such as Erie Pier. If it becomes necessary to establish a new borrow site for the project, this action will be subject to all required reviews for potential to impact cultural or other resources.

Geotechnical borings of the area of Superior Bay adjacent to the Airport showed that soil conditions in Superior Bay southwest of the Airport consist of very loose sand with occasional layers of very soft silty clay underlain by a very soft layer of organic clay and silt. Due to the low strength of the existing soils, it will be necessary to stage filling along the shore of Superior Bay. In addition, a surcharge will be used on the site to mitigate any anticipated settlement prior to construction of the runway after fill placement. Similar to fill material, the surcharge material is anticipated to be obtained from an established, existing borrow site. Conceptual engineering of this alternative proposes the following construction stages (see **Figure 2-2**):

- **Perimeter Berm Stage:** This stage includes construction of a perimeter berm encompassing the site in the harbor. The berm will be underlain by a separation geotextile and will be constructed to an elevation of 603 to 605 feet MSL. A floating silt curtain will be placed around the perimeter of the site prior to placement of any fill in the bay and will remain in place for the duration of fill placement. It is anticipated that this perimeter berm will be constructed of rock in order to provide a stable access road around the site for construction. Prior to riprap placement, approximately 8,600 cubic yards of material will be excavated from the lake bottom for the riprap toe (see **Figure 2-3**). The excavated material will be stored on site for use as fill or surcharge. The Airport runway will be closed during periods of construction of this stage but will re-open during the stabilization period.
- **Stage 1:** Fill will be placed within the perimeter berm up to an elevation of 605 feet MSL. Riprap placement around the project perimeter will also be completed at this time. A reinforcement geotextile will be placed at 602 feet MSL, or slightly above lake level (601 feet MSL based on survey completed in 2009 and 2012), to prevent slope failure. Upon completion of Stage 1, the site will stabilize in place over a period of three months prior to construction of Stage 2. The runway will be closed during periods of construction of this stage but will re-open during the stabilization period.
- **Stage 2:** The remaining fill and a surcharge of five feet will be placed. Since the grade of the proposed runway is variable, the top elevation of the surcharge will vary from 611 feet to 614 feet MSL. The surcharge will need to stabilize over a period of approximately six to nine months. The floating silt curtain will be required to be removed over winter months. However, heavy duty silt fence will also be used along the embankment after each phase of fill. The runway will be closed for the duration of this stage.
- **Stage 3:** The excess surcharge will be removed and the runway and taxiway will be constructed. The removed surcharge will be reused on site. A typical section of the runway and completed fill is shown on **Figure 2-3**. The runway will remain closed for the duration of this stage.

Impact Avoidance and Minimization

The ability to avoid and minimize impacts to surface waters is limited due to the requirement to establish a standard FAA RSA for the proposed runway. Construction staging and BMPs will be used to avoid additional unnecessary and/or unauthorized impacts to surface waters and aquatic resources. Additional efforts to minimize impacts to surface waters would be made during project design.

Permitting and Mitigation

Surface waters and effects to aquatic resources are regulated at the federal level under Sections 401 and 404 of the Clean Water Act. For this project, these surface waters are also regulated federally under Section 10 of the Rivers and Harbors Act. At the state level, effects to these surface waters are regulated by the MNDNR and MPCA. Early coordination has been ongoing with federal and state officials during participation in the EA Scoping Process, the Technical Advisory Panel and through the merged NEPA/Section 404 process described in **Section 1.4**.

Loss of 7.49 acres of aquatic habitat in Superior Bay for runway reconstruction may require mitigation such as enhancement of in-water habitat. Mitigation for fisheries impacts will be based on the provision of habitat, and may be partially accomplished by maintaining the hard substrates that are currently present as a riprapped shoreline. The proposed project will also utilize riprap to stabilize the shoreline, which will provide a similar habitat to what is present currently. Riprap can provide for a habitat type that may be lacking within the harbor, and is of greater benefit to fisheries than would be provided by a grouted structure, retaining wall, or sheet piling.

Projects that may provide mitigation opportunities include: Allouez Bay vegetation restoration including removal of invasive species and re-establishment of wild rice, Pickle Pond habitat enhancement near Barker's Island, and Newton Creek/Hog Island ongoing vegetation and habitat restoration. These three projects are located within three miles of the proposed action, and are planned to help address the past loss of fish and wildlife habitat in the St. Louis River AOC. If contribution to one of these three projects is not feasible at the time of project permitting, there are other projects available within the AOC that could be considered. Coordination with MNDNR and USACE during the permitting process will clearly define the mitigation plan for the proposed action.

The preliminary preferred alternative will not change the number or type of watercraft on any waterbody.

Alternative 13

Alternative 13 includes fill in Superior Bay in order to construct the proposed runway and establishment of the RSA to FAA standards. The fill includes approximately 24,360 cubic yards of fill in the bay (including fill below and above the water line). Fill from this alternative would include impacts to approximately 3.40 acres of Superior Bay.

Mitigation for surface water impacts to 3.40 acres of Superior Bay would be similar to that described for the preliminary preferred alternative above. Contributions to ongoing restoration or enhancement projects could be also be considered.

Alternative 13 will not change the number or type of watercraft on any waterbody.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. No direct or indirect wetland impacts or impacts to other surface waters would occur as a result of the No Action Alternative. The no action alternative will not change the number or type of watercraft on any waterbody.

3.16.2 Groundwater Resources (*EAW Item 11.a.ii*)

EAW Item 11.a.ii. Groundwater - aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.

Approximate depth to groundwater at the project site is two (2) feet. The Airport is served by a City of Duluth water line, and does not use groundwater for consumption. The project is not within a Minnesota Department of Health (MDH) wellhead protection area. No nearby wells were identified by the MDH County Well Index Online (MDH 2014).

3.16.3 Water Use (EAW Item 11.b.iii.)

EAW Item 11.b.iii. Water appropriation. Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.

The Airport is served by a City of Duluth water line. The Airport does not use groundwater for consumption.

3.16.4 Water-Related Zoning (EAW Item 9.a.iii.)

EAW Item 9.a.iii. Zoning. Discuss zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 9b above. If yes, identify the district and discuss project compatibility with district land use restrictions.

3.16.4.1 Shoreland Zoning District

The City of Duluth Natural Resources Overlay Zone District Map indicates that the Airport and Minnesota Point are located along general development waters. The shoreland overlay district applies to all Lake Superior shoreland and lands within 1,000 feet of Lake Superior or within 300 feet of rivers, creeks, streams and tributaries and floodplains. This district is depicted on **Figure 3-12**.

3.16.4.2 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

This alternative requires approximately 69,800 cubic yards of fill material placed over approximately 7.49 acres within the general development shoreland zoning area of Lake Superior and therefore a Shoreland Permit from the City of Duluth is required. A condition of the permit requires erosion and sediment control measures for all land disturbing activities within the shoreland overlay district. The permit also requires that grading or filling of more than 250 square feet or a quantity of fill exceeding 10 cubic yards to have city approved erosion control, storm water management, and shoreline buffer restoration plans. Impervious surfaces shall be designed and constructed to minimize and control runoff and erosion into Lake Superior. Naturally vegetated buffers shall be restored to the extent feasible after completion of the project.

The City of Duluth minimum shoreland area standards require a minimum setback of 50 feet for impervious surfaces along with a 50-foot naturally vegetated buffer in general development waters. Due to the location of the fill and proposed runway being extended out into Superior Bay below the Ordinary High Water Mark, a variance from the City of Duluth will be required. In addition, less than a 50-foot vegetative buffer will be established between the edge of impervious surface and the shore since the minimum required RSA (extending 30 feet from the edge of pavement) is being established in order to minimize fill in Superior Bay. Extending the area of fill 20 feet to create a 50-foot naturally vegetated buffer would increase surface water impacts due to a large amount of additional fill in the bay, and significantly increase project costs for transporting and placing the fill and surcharge. This action is eligible for a variance of City of Duluth shoreland zoning requirements for the 50-foot buffer, as reducing the buffer width reduces adverse consequences to the environment by minimizing fill in the bay.

Alternative 13

This alternative requires approximately 24,360 cubic yards of fill placed over 3.4 acres within the general development shoreland zoning area of Lake Superior and therefore a Shoreland Permit from the City of Duluth must be obtained. A condition of the permit requires erosion and sediment control measures for all land disturbing activities within the shoreland overlay area. The permit also requires that grading or filling of more than 250 square feet or a quantity of fill exceeding 10 cubic yards to have city approved erosion control, storm water management and shoreline buffer restoration plans. Impervious surfaces shall be designed and constructed to minimize and control runoff and erosion into Lake Superior. Naturally vegetated buffers shall be restored to the extent feasible after completion of the project.

The City of Duluth minimum shoreland area standards require a minimum setback of 50 feet for impervious surfaces along with a 50 foot naturally vegetated buffer in general development waters. Due to the location of the fill and proposed runway being extended out into Superior Bay below the Ordinary High Water Mark, a variance from the City of Duluth must be obtained. In addition, less than a 50-foot vegetative buffer will be established between the edge of impervious surface and the shore since the minimum required RSA (extending 30 feet from the edge of pavement) is being established in order to minimize fill in Superior Bay. Extending the area of fill 20 feet to create a 50-foot naturally vegetated buffer would increase surface water impacts due to a large amount of additional fill in the bay, and significantly increase project costs for transporting and placing the fill and surcharge. This action is eligible for a variance of City of Duluth shoreland zoning requirements, as it reduces adverse consequences to the environment by minimizing fill in the bay.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. Airport facilities would be replaced with natural vegetation. A shoreland permit would be required from the City of Duluth for work near Superior Bay during removal of the existing facilities and any subsequent future construction work on the property.

3.16.5 Surface Water Runoff (*EAW Item 11.b.ii.*)

EAW Item 11.b.ii. Describe the quantity and quality of stormwater runoff at the site prior to and post construction. Include the routes and receiving water bodies for runoff from the site (major downstream water bodies as well as the immediate receiving waters). Discuss any environmental effects from stormwater discharges. Describe stormwater pollution prevention plans including temporary and permanent runoff controls and potential BMP site locations to manage or treat stormwater runoff. Identify specific erosion control, sedimentation control or stabilization measures to address soil limitations during and after project construction.

The sand bar making up Minnesota Point (on which the Airport is located) is bounded by Lake Superior on the north and Superior Bay on the south. Lake Superior is the largest of the Great Lakes and the largest surface area of any freshwater lake in the world. The average depth is nearly 500 feet making Lake Superior the coldest and deepest of the Great Lakes. The drainage basin is approximately 49,300 square miles and encompasses parts of three states (Michigan, Minnesota, and Wisconsin) and one Canadian province (Ontario). Superior Bay is the narrow inlet of western Lake Superior. The bay is seven miles long and ½- to one-mile wide, separated and sheltered from Lake Superior by Minnesota Point. Receiving the St. Louis River, the bay forms part of one of the most important harbors on the Great Lakes.

Lake Superior is an impaired lake under two categories as established by MPCA: Mercury in Fish Tissue and polychlorinated biphenyl (PCB) in Fish Tissue. These impairments affect aquatic consumption, but are non-construction related. Impaired waters are those waters that do not meet state water quality standards as defined by Section 303(d) of the federal Clean Water Act. Lake Superior is also classified by the MPCA as a “Special Water” which requires additional BMPs for the treatment and management of discharges to Lake Superior.

St. Louis Bay of the St. Louis River is also listed as an “Impaired Water” by the MPCA. The water body is impaired for non-construction related parameters, including: Dieldrin, Dioxin, DDT, Mercury in Fish Tissue, Mercury in Water Column, PCB in Fish Tissue, PCB in Water Column, and Toxaphene. All of these impairments affect aquatic consumption.

Typical pollutants carried in airport runoff could include spilled fuel and oil, deposits from rubber tires and accidentally discharged chemicals. At the Duluth-Sky Harbor Airport, fuel is dispensed to aircraft located on the apron and aircraft located at the dock through the same fueling system which includes a 3,000 gallon 100LL tank. The Airport has a NPDES Industrial Stormwater Permit and corresponding SWPPP which requires the Airport to monitor and manage stormwater runoff from industrial activity areas. The current industrial stormwater permit held by the Airport restricts the use of infiltration BMPs where the facility utilizes deicing activities. Neither the Airport nor aircraft owners conduct or plan to conduct deicing operations in the future, and the Airport is therefore allowed to utilize infiltration BMPs for stormwater treatment. If aircraft require ice removal, aircraft may be placed in heated hangars to melt the ice through non-chemical means.

Stormwater runoff from the Airport in existing conditions is collected in vegetated swales. Most if not all of the runoff is then infiltrated through the site’s sandy soils (see **Sections 3.11.3** and **3.11.4** for details on soil types and protection of groundwater). This nearly eliminates direct surface runoff leaving the Airport and entering the surrounding surface waters. In the rare instances where runoff may leave the site during large rain events, runoff is directed to the north and south through culverts before entering Superior Bay. Existing runoff is summarized in **Table 3-9**. Existing and proposed runoff management treatment and routing are illustrated in **Figure 3-13**. This stormwater treatment system is effective and meets current requirements. There are no currently-used drinking water intakes in the vicinity of the Airport that would be affected by runoff from the Airport.

**Table 3-9
Existing Airport Runoff**

2-Year, 24-Hour Event		10-Year, 24-Hour Event		100-Year, 24-Hour Event	
Peak Flow (cfs)	Volume (af)	Peak Flow (cfs)	Volume (af)	Peak Flow (cfs)	Volume (af)
0.17	0.13	7.28	0.92	31.21	2.46

Note: Cubic feet per second (cfs), Acre feet (af)

3.16.5.2 Environmental Consequences

The federal Water Pollution Control Act, as amended (commonly referred to as the Clean Water Act), provides the authority to: establish water quality standards, control discharges, develop waste treatment management plans and practices, prevent or minimize the loss of wetlands, and regulate other issues concerning water quality. Additionally, a NPDES permit under Section 402 of the Clean Water Act is required for point-source discharges into Waters of the U.S. and for construction activities to protect from construction-related erosion and sedimentation. A Section 404 permit is required to place dredged or fill material in Waters of the U.S. including jurisdictional wetlands. Section 401 Water Quality Certification is also required, which is generally authorized by the MPCA. However, Water Quality Certification may be encompassed within any Section 404 permits authorized by the USACE.

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short would result in an approximately 1.907 acre (83,075 ft²) reduction in impervious surface at the facility (including the runway, taxiway, aircraft parking apron, and hangars), reducing the impervious surface from 13.026 acres (567,414 ft²) of existing impervious surface to 11.119 acres (484,339 ft²). Therefore, this alternative creates a corresponding reduction in water quantity in the form of runoff. The 2-Year, 24-Hour Event Peak flow results in a reduction in runoff to 0.05 cubic feet per second (cfs) compared to 0.17 cfs in the existing conditions. The 10-Year, 24-Hour Event peak flow results in 1.78 cfs compared to 7.28 in the existing conditions. The 100 Year 24 Hour Event results in a peak flow of 17.85 cfs compared to 31.21 in the existing conditions.

Surface water management on the Airport would include both construction site erosion and sediment control and post-construction stormwater management. BMPs (such as floating silt curtain, described below) would be applied in accordance with the approved technical standards and to meet the required performance standards.

During construction, in particular for areas in Superior Bay, a floating silt curtain will be installed around the perimeter of the site prior to placement of any fill material and will be maintained during the duration of fill placement. Upon completion of each phase of fill placement, a heavy duty silt fence will be placed on the embankment. It will be necessary to remove the floating silt curtain during the winter months. Post-construction, Alternative 5a Short would utilize the same overland infiltration and filtration BMPs as the existing conditions for the management and treatment of stormwater runoff.

The Airport will update the MPCA NPDES Industrial Stormwater Permit and corresponding SWPPP to address the changes in airport facilities. Construction of this alternative will disturb more than one acre of land and will require an MPCA NPDES Construction Permit and SWPPP to manage construction site runoff and erosion and sediment control. This alternative will result in a reduction of the overall impervious surface and will not require permanent stormwater treatment measures under this permit. The City of Duluth requires a MS4 Statement of Compliance from the City Engineer and because the alternative creates and redevelops

more than one acre of impervious surface, City of Duluth regulations require compliance with the following conditions in addition to Ownership and Maintenance Controls:

1. Water Quality Treatment: Reduction in Total Suspended Solids (TSS) of 50%.
2. Volume Reduction: For the first ½-inch of rainfall from the newly created impervious surface or provide 85% TSS removal.
3. Runoff Rate Control: Match or reduce peak flow rates from predevelopment conditions for all storm events.
4. Drainage Report.

Reduced impervious surface and required TSS removal for the preliminary preferred alternative should result in reduced quantity of stormwater runoff from the site to the receiving water (Superior Bay). Quality of stormwater runoff would not decrease under Alternative 5a Short, and the anticipated effect on the receiving water due to stormwater runoff is negligible to beneficial, if any.

Alternative 13

Alternative 13 would result in an approximately 1.827 acre (79,587 ft²) reduction in impervious surface at the facility (including the runway, taxiway, aircraft parking apron, and hangars), reducing the impervious surface from 13.026 acres (567,414 ft²) of existing impervious surface to 11.199 acres (487,827 ft²). Therefore, this alternative creates a corresponding reduction in water quantity and improved water quality from the existing conditions. The 2-Year, 24-Hour Event Peak flow results in a reduction in runoff to 0.05 cubic feet per second (cfs) compared to 0.17 cfs in the existing conditions. The 10-Year, 24-Hour Event peak flow results in 1.78 cfs compared to 7.28 in the existing conditions. The 100-Year, 24-Hour Event results in a peak flow of 17.85 cfs compared to 31.21 in the existing conditions.

Surface water management on the Airport would include both construction site erosion and sediment control and post-construction stormwater management. BMPs would be applied in accordance with the approved technical standards and to meet the required performance standards.

During construction, a floating silt curtain will be installed around the perimeter of the site prior to placement of any fill material and will be maintained during the duration of fill placement. Upon completion of each phase of fill placement, a heavy duty silt fence will be placed on any embankment. It will be necessary to remove the floating silt curtain during the winter months. Post-construction, Alternative 13 would utilize the same overland infiltration and filtration BMPs as the existing conditions for the management and treatment of stormwater runoff.

The Airport will update the MPCA NPDES Industrial Stormwater Permit and corresponding SWPPP to address the changes in airport facilities. Construction of this alternative will disturb more than one acre of land and will require an MPCA NPDES Construction Permit and SWPPP to manage construction site runoff and erosion and sediment control. This alternative will result in a reduction of the overall impervious surface and will not require permanent stormwater treatment measures under this permit. The City of Duluth requires a Municipal Separate Storm Sewer System (MS4) Statement of Compliance from the City Engineer and because the alternative creates and redevelops more than one acre of impervious surface, City of Duluth regulations requires compliance with the following in addition to Ownership and Maintenance Controls:

1. Water Quality Treatment: Reduction in TSS of 50%
2. Volume Reduction: For the first ½ inch of rainfall from the newly created impervious surface or provide 85% TSS removal
3. Runoff Rate Control: Match or reduce peak flow rates from predevelopment conditions for all storm events.

4. Drainage Report

Reduced impervious surface and required TSS removal for the preliminary preferred alternative should result in reduced quantity of stormwater runoff from the site to the receiving water (Superior Bay). Quality of stormwater runoff would not decrease under Alternative 5a Short, and so the anticipated effect on the receiving water due to stormwater runoff is negligible to beneficial, if any.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. The removal of all airport facilities would potentially result in an elimination of all impervious surfaces (13.026 acres) at the Airport. If all impervious surfaces were removed, the no action alternative would result in a corresponding reduction in water quantity and improved water quality from the existing conditions. The 2-Year, 24-Hour Event Peak flow results in a reduction in runoff to 0.00 cubic feet per second (cfs) compared to 0.17 cfs in the existing conditions. The 10-Year, 24-Hour Event peak flow results in 0.08 cfs compared to 7.28 in the existing conditions. The 100 Year 24 Hour Event results in a peak flow of 1.25 cfs compared to 31.21 in the existing conditions. If the future land use as a public recreational area included construction of impervious surface, flow rates would increase commensurate with the amount of impervious surface. It is unknown at this time what the ultimate land cover would be if the area is converted into public recreational use.

The no action alternative would require a MPCA NPDES Construction Permit and SWPPP to manage construction site runoff and erosion and sediment control. A MS4 Statement of Compliance from the City Engineer will be required. No permanent stormwater treatment controls would be required if all impervious surfaces were removed. Also, no Water Quality Treatment, Volume Reduction, Runoff Rate Control, Drainage Report or operation and/or maintenance measures would be required by the City of Duluth.

3.16.6 Wastewaters (EAW Item 11.b.i.)

EAW Item 11.b.i. For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic and industrial wastewater produced or treated at the site.

- 1) *If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.*
- 2) *If the wastewater discharge is to a subsurface sewage treatment systems (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system.*
- 3) *If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges.*

The A/D building receives city municipal water but is not connected to the city municipal sewer system. Sanitary waste from the A/D building is collected in a drain field as part of the septic system. The septic system provides for collection of sanitary wastewater from the onsite living quarters (one apartment for a DAA staff member) and public restroom facilities in the A/D building. The system has low use and is pumped on an as-needed basis.

Material pumped from the septic system is removed to the WLSSD for treatment. The septic waste requires no pretreatment prior to delivery to the WLSSD. The volume and composition of wastewater is similar to that

generated at a single-family residence and is not beyond the capacity of the WLSSD nor does it require any improvements to that facility.

No municipal or industrial wastewater is produced or treated at the Airport site.

3.16.6.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

Alternative 5a Short would result in no changes to the quantity or quality of sanitary wastewater generated at the Airport. Sanitary wastes collected in the on-site septic system would continue to be removed regularly to the WLSSD for treatment.

Alternative 13

Similar to Alternative 5a Short, Alternative 13 would result in no changes to the quantity or quality of sanitary wastewater generated at the Airport. Sanitary wastes collected in the on-site septic system would continue to be removed regularly to the WLSSD for treatment.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. The removal of airport facilities and the Airport use would result in an elimination of all sanitary wastewater generated at the Airport site.

3.17 Wetlands

Wetlands in the project area are subject to regulation under Sections 401 and 404 of the federal Clean Water Act as regulated by the USACE, the Minnesota Wetland Conservation Act of 1991 (WCA), MPCA under Minnesota Rules 7050, and MNDNR Public Waters rules. Actions that are implemented by a federal agency are also subject to Executive Order 11990 mandating that federal agencies through their actions, implement “no net loss” of wetlands. Deep water areas in Lake Superior and Superior Bay are also regulated by the USACE under Section 10 of the River and Harbors Act and as Public Waters by the MNDNR.

The National Wetlands Inventory (NWI) and St. Louis County Soil Survey data were reviewed to identify known wetland resources or areas of hydric soils in the project area. The *Minnesota Point Environmental Plan* makes numerous references to wetlands on Minnesota Point, but none are shown in close proximity to the project on the NWI or soil mapping. A wetland delineation was completed for the project area in 2008. One Type 6 shrub swamp (Shrub-Carr) was identified and delineated. The wetland is located near the boundary with the SNA on the northeast side of the existing runway. The small wetland is dominated by speckled alder (*Alnus incana* - OBL), red-osier dogwood (*Cornus stolonifera* - FACW), and a species of willow (*Salix sp.*) in the shrub layer and by red raspberry (*Rubus ideaus* - FACU) and field horsetail (*Equisetum arvense* - FAC) in the herbaceous layer. The soil profile consisted of 10YR 3/1 silty clay with 15% 5YR 4/6 redox concentrations from 0-7 inches, 10YR 4/3 silty clay with 20% 5YR 4/6 redox concentrations from 7-9 inches, and 10YR 3/2 silty clay with 50% 2.5YR 3/6 redox depletions from at least 9-12 inches below ground surface. This wetland is shown on **Figure 3-14**.

3.17.1.1 Environmental Consequences

Preliminary Preferred Alternative: Alternative 5a Short

The rotation of the runway will relocate the Runway 32 end farther away from the existing wetland. The wetland will be avoided during the removal of the existing runway and construction of the new runway. As a result, no wetland impacts will result from the preliminary preferred alternative.

Alternative 13

Construction of Alternative 13 would avoid wetland impacts. As a result, no wetland impacts will result from Alternative 13 and no wetland mitigation would be required.

No Action

The no action alternative would result in loss of Airport licensure and closure of the facility. No direct or indirect wetland impacts or impacts to other surface waters would occur as a result of the no action alternative.

3.18 Wild and Scenic Rivers

Wild and scenic rivers are designated as part of the National Wild and Scenic River Program by the U.S. Department of the Interior under the Wild and Scenic River Act to protect the most beautiful and unspoiled rivers in the nation. River segments are designated based on their outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values and are to be preserved in free-flowing condition for the benefit and enjoyment of present and future generations. There are no designated National Wild and Scenic River areas within the St. Louis River watershed or in the surrounding area. The nearest National Wild and Scenic River corridor, the St. Croix/Namekagan Rivers, is found approximately 60 miles south and east of the Airport.

The State of Minnesota Wild and Scenic Rivers Protection Act program assists communities in developing management plans that protect the scenic, recreational, natural, historical, and cultural values for which the rivers were originally designated. Six rivers in Minnesota have segments that are designated as wild, scenic, or recreational under the state program. Each designated wild, scenic, or recreational river segment in Minnesota has a management plan that outlines the rules and goals for that waterway. These rules work together with local zoning ordinances to protect the rivers from pollution, erosion, over-development, and degradation. There are no designated state wild, scenic or recreational sections within the St. Louis River watershed or in the surrounding area.

There are no rivers or segments of rivers within the project area that are designated as Wild and Scenic Rivers. Therefore, analysis of the preliminary preferred alternative, Alternative 13 and the no action alternative with respect to potential impacts to Wild and Scenic Rivers is not applicable.

3.19 Other Potential Impacts (EAW Item 20)

Potential environmental impacts are addressed throughout this document and the appendices. No additional environmental impacts are known.



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Environmental Assessment
Duluth, Minnesota

Project: DULAI 122129
Print Date: 11/21/2013

Legend

- MCBS Native Plants**
- Alder - (Maple - Loosestrife) Swamp
 - Aspen - Ash Forest
 - Beachgrass Dune (Lake Superior)
 - Juniper Dune Shrubland (Lake Superior)
 - Red Pine - White Pine Woodland (Minnesota Point)
 - Sand Beach (Lake Superior)
 - Sedge Meadow
 - Young Forest Complex

Figure 3-1A

Native Plant Communities Existing Overall Conditions



0 1,500 Feet

Map by: naa/SrH
Projection: NAD 83, St Louis County Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H, MnDNR, SEH

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MCBS Native Plants		Existing Obstruction Lights
	Alder - (Maple - Loosestrife) Swamp	
	Aspen - Ash Forest	
	Beachgrass Dune (Lake Superior)	
	Disturbed Grassland	
	Juniper Dune Shrubland (Lake Superior)	
	Red Pine - White Pine Woodland (Minnesota Point)	
	Sand Beach (Lake Superior)	
	Sedge Meadow	
	Young Forest Complex	

Figure 3-1B
Native Plant Communities Existing Runway Area Conditions



0 500 Feet
Map by: naa/SrH
Projection: NAD 83, St Louis County Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H, MnDNR, SEH

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Superior Bay

Sky Harbor Airport

Lake Superior



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- MCBS Native Plants**
- Alder - (Maple - Loosestrife) Swamp
 - Aspen - Ash Forest
 - Beachgrass Dune (Lake Superior)
 - Disturbed Grassland
 - Juniper Dune Shrubland (Lake Superior)
 - Red Pine - White Pine Woodland (Minnesota Point)
 - Sand Beach (Lake Superior)
 - Sedge Meadow
 - Young Forest Complex

- Alternate 5A Short**
- Centerline Alignment
 - Runway Element
 - Stage 1
 - V-WRES
 - Existing Obstruction Lights (to remain)
 - Existing Obstruction Lights (to be shut off)
 - Future Obstruction Light
 - New Obstruction Light
 - Eliminated From Proposal

Figure 3-1C
Native Plant Communities
Proposed Runway Area Conditions



0 500 Feet

Map by: naa/SrH
Projection: NAD 83, St Louis County Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H, MnDNR, SEH

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Legend
X Samples

Figure 3-2
Benthic and Pollutant Testing Sites



Map by: naa/SrH
Projection: NAD 83, St Louis County Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H, MnDNR, SEH

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Lake Superior

Superior Bay

Sky Harbor Airport

Minnesota Ave



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Legend
 Coastal Boundary

Figure 3-3
Coastal Boundary



0 2,000 Feet

Map by: naa/SrH
Projection: NAD 83, St Louis County Transvers Mercator 1996
Source: MnGeo 2009, RS&H, MnDNR, SEH

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- Legend**
- Anchorage Area
 - Channel
 - Preservation
 - Recreation
 - Transportation

Figure 3-4
Land Uses



Map by: SrH
Projection: NAD 83, St Louis County
Transvers Mercator 1996
Source: MnGEO 2009, RS&H,
MnDNR, SEH

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Legend

UDC Zoning

- Low-Rise Neighborhood
- Mid-Rise Community
- Downtown
- Canal Park Lakefront
- Mixed Use Waterfront
- Rural Residential
- Residential Traditional
- Residential Urban
- Residential Planned
- Mixed Use Neighborhood
- Mixed Use Commercial
- Mixed Use Institutional
- Mixed Use Business Park
- Industrial General
- Industrial Waterfront
- Park
- Rural Conservation

Figure 3-5

Duluth Zoning



0 6,000
Feet

Map by: naa/SrH
Projection: NAD 83, St Louis County
Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H,
MnDNR, SEH, City of Duluth

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Legend

Zoning	Commercial
1 Family Residential	Highway Commercial
2 Family Residential	Shopping Center District
Apartment Residential	Planned Development District
Suburban	Manufacturing District
	Waterfront District

Figure 3-6
Superior Zoning



0 2,000 Feet
Map by: naa/SrH
Projection: NAD 83, St Louis County Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H, MnDNR, SEH

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LEGEND

-  NAVIGATION CHANNEL
-  ANCHORAGE AREA
-  EXISTING AIRPORT ZONING

SOURCE:

CITY OF DULUTH ORDINANCE NO. 9215
SKY HARBOR AIRPORT ZONING



DRAFT ENVIRONMENTAL
ASSESSMENT

ADULAI0801.00

MARCH 2013

**SKY HARBOR AIRPORT
AIRPORT ZONING
ORDINANCE**

Figure 3-7





Path: \\172.16.16.51\Projects\AE\DU\dul080100\GIS\Maps\EA\Drain\EA\EA_Fig3-8_Farmland_8x11P.mxd



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Duluth Sky Harbor Airport
Environmental Assessment
Duluth, Minnesota

Project: DULAI 122129
Print Date: 03/01/2013

Legend

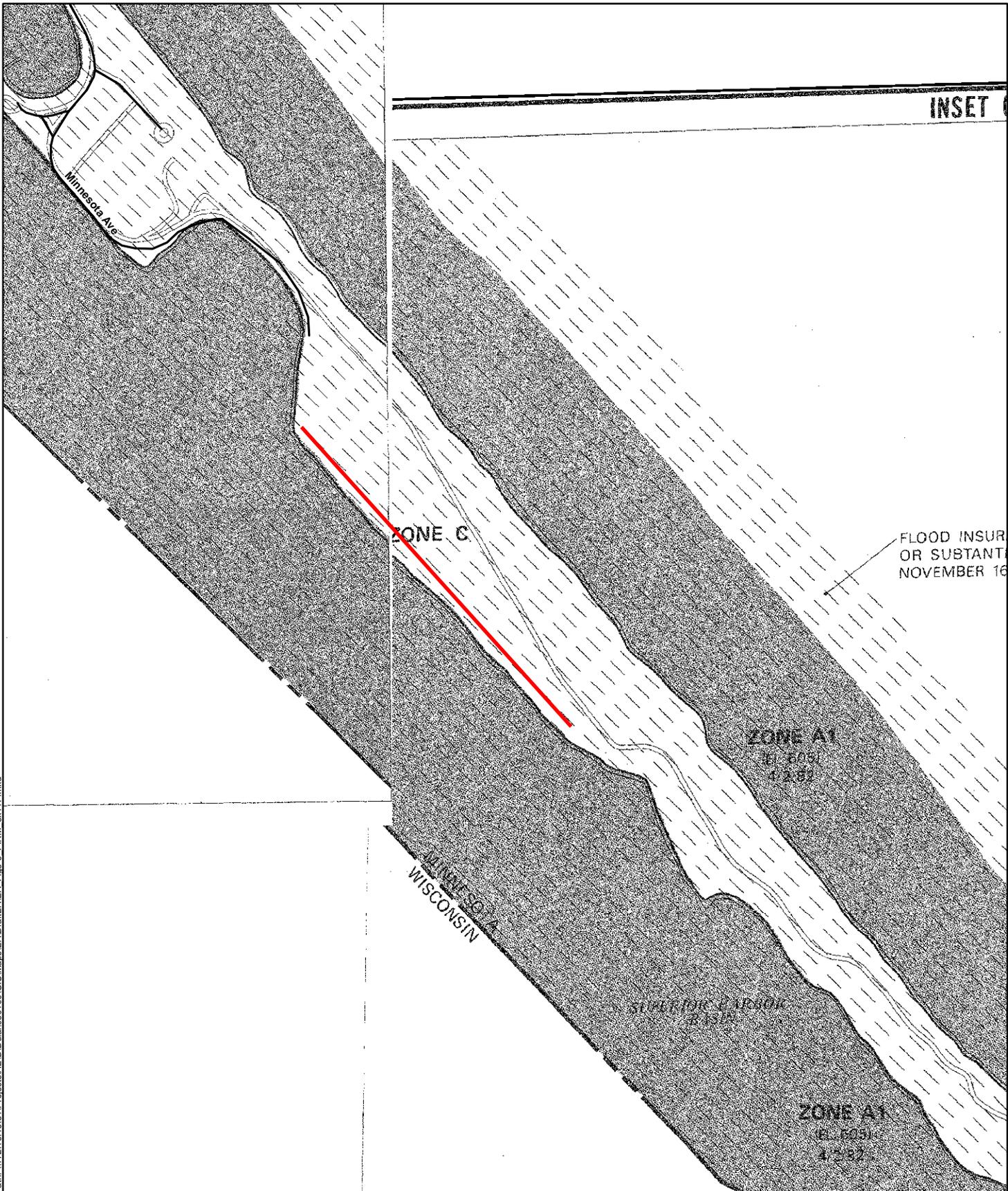
- Prime farmland
- Farmland of statewide importance
- Prime farmland if drained
- Not prime farmland

Figure 3-8
Farmland Soils



Map by: naa/SrH
Projection: NAD 83, St Louis County
Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H,
MnDNR, SEH

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- Existing Runway
- FIRM Zone Explanation
- Zone A1 - Areas of 100-year flood; base flood elevations and flood hazard factors are determined
- Zone C - Areas of minimal flooding. (No shading)

Figure 3-9
FEMA FIRM Floodplain



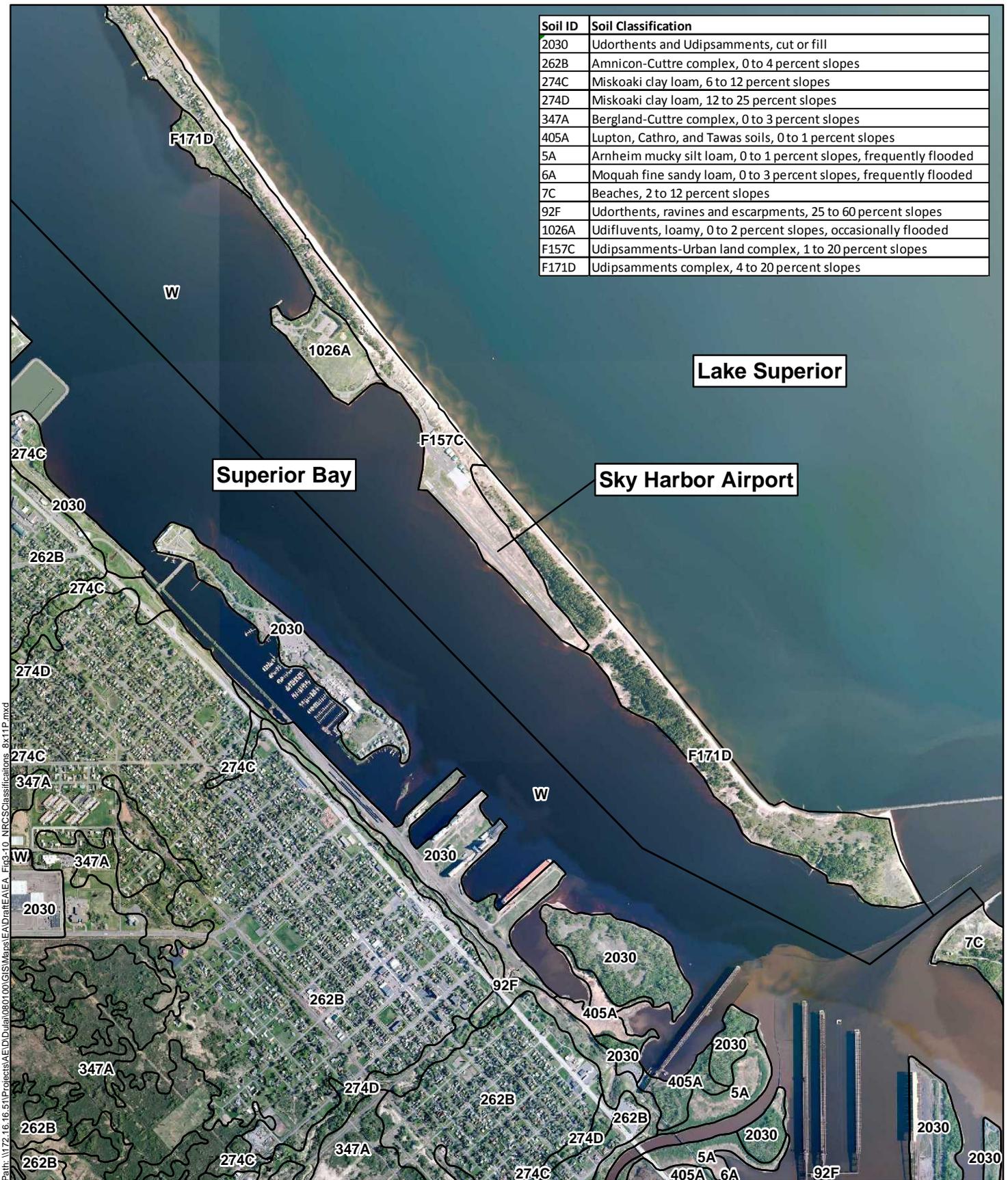


0 1,000 Feet

Map by: naa/SrH
Projection: NAD 83, St Louis County Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H, MnDNR, SEH

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Soil ID	Soil Classification
2030	Udorthents and Udipsamments, cut or fill
262B	Amnicon-Cuttre complex, 0 to 4 percent slopes
274C	Miskoaki clay loam, 6 to 12 percent slopes
274D	Miskoaki clay loam, 12 to 25 percent slopes
347A	Bergland-Cuttre complex, 0 to 3 percent slopes
405A	Lupton, Cathro, and Tawas soils, 0 to 1 percent slopes
5A	Arnheim mucky silt loam, 0 to 1 percent slopes, frequently flooded
6A	Moquah fine sandy loam, 0 to 3 percent slopes, frequently flooded
7C	Beaches, 2 to 12 percent slopes
92F	Udorthents, ravines and escarpments, 25 to 60 percent slopes
1026A	Udfluvents, loamy, 0 to 2 percent slopes, occasionally flooded
F157C	Udipsamments-Urban land complex, 1 to 20 percent slopes
F171D	Udipsamments complex, 4 to 20 percent slopes



Path: \\ITZ\16_16_51\Projects\AE\DU\080100\GIS\Maps\EA\Drain\EA Fig3-10_NRCSClassifications_8x11P.mxd



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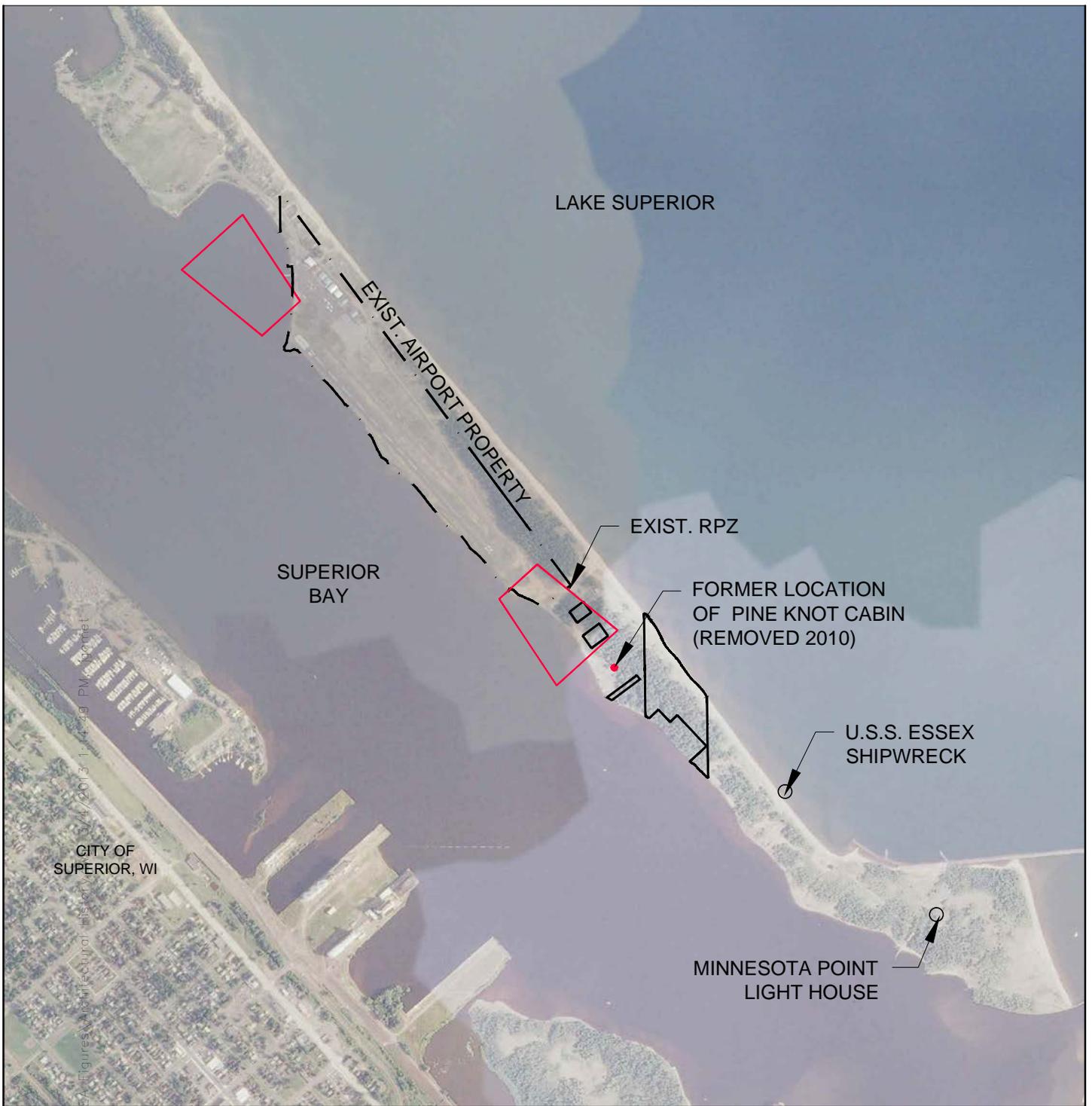
Legend
Soils

Figure 3-10
NRCS Classifications



Map by: naa/SrH
Projection: NAD 83, St Louis County Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H, MnDNR, SEH

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	<p>ENVIRONMENTAL ASSESSMENT</p> <p>ADULAI0801.00</p> <p>MARCH 2013</p>	<p>SKY HARBOR AIRPORT</p> <p>ARCHITECTURAL HISTORY</p>	<p>Figure 3-11</p>	
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Legend
 Shoreland Management Zones

Figure 3-12
Shoreland Management Zones



0 2,000 Feet

Map by: SrH
Projection: NAD 83, St. Louis County
Transvers Mercator 1996
Source: MnGEO 2009, RS&H,
MnDNR, SEH

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CUMULATIVE IMPERVIOUS SURFACE:

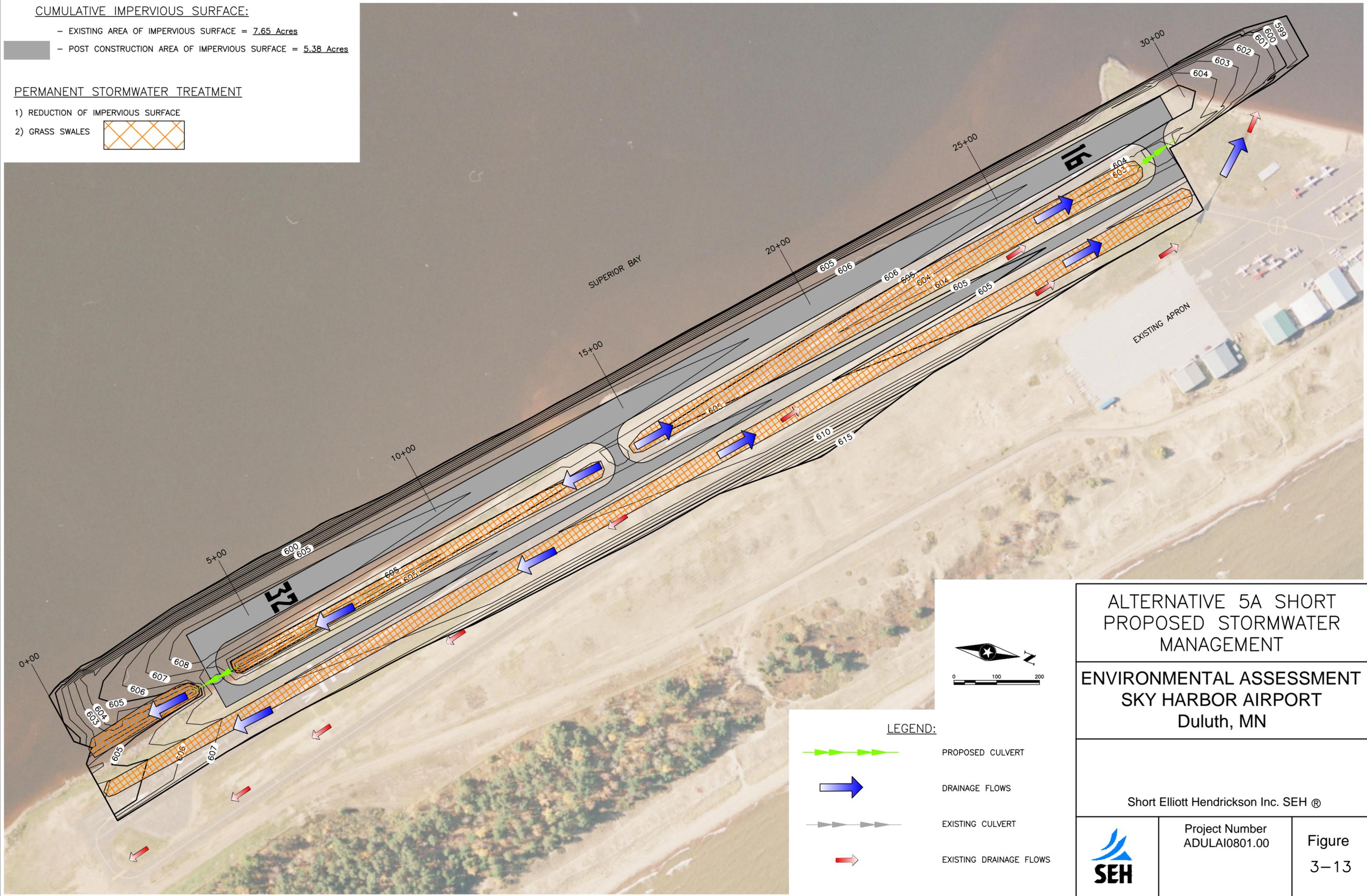
- EXISTING AREA OF IMPERVIOUS SURFACE = 7.65 Acres
- POST CONSTRUCTION AREA OF IMPERVIOUS SURFACE = 5.38 Acres

PERMANENT STORMWATER TREATMENT

- 1) REDUCTION OF IMPERVIOUS SURFACE
- 2) GRASS SWALES



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LEGEND:

- PROPOSED CULVERT
- DRAINAGE FLOWS
- EXISTING CULVERT
- EXISTING DRAINAGE FLOWS

ALTERNATIVE 5A SHORT PROPOSED STORMWATER MANAGEMENT		
ENVIRONMENTAL ASSESSMENT SKY HARBOR AIRPORT Duluth, MN		
Short Elliott Hendrickson Inc. SEH®		
	Project Number ADULA10801.00	Figure 3-13



Path: S:\A\ED\08100\GIS\Maps\EAD\Draft\EA_EA_Fig3-14_Wetlands_8x11P.mxd



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Duluth, Minnesota

Project: DULAI 122129
Print Date: 11/11/2013

Legend
SEH Delineated Wetland

Figure 3-14
Wetlands



Map by: naa/SrH
Projection: NAD 83, St Louis County
Transvers Mercator 1996
Source: USDA NAIP 2008, RS&H,
MnDNR, SEH

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