Hangar Site Work and Hazard Mitigation
Fosston Municipal Airport
Fosston, Minnesota

ENVIRONMENTAL ASSESSMENT

U.S. Department of Transportation
Federal Aviation Administration
Fosston Municipal Airport

April 8th, 2020

This Environmental Assessment becomes a Federal document when evaluated, signed and dated by the responsible FAA official.

JOSHUA T FITZPATRICK

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Responsible FAA Official

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1.0 PROJECT PURPOSE

The Fosston Municipal Airport (FSE) is located on a 308 acre parcel, approximately 1 mile northwest of the Fosston City center along US Highway 2 (Appendix B: Figure 1 - General Location). It has a single utility runway that is 3,502 feet long and 75 feet wide and designed for aircraft 12,500 pounds or less. Initially established during the World War II era, the Airport has seen incremental growth throughout the years. The City has managed the Airport since 1946 and during that time, it has experienced various developments. This includes the addition of runway lighting in 1959, a runway extension in the 1970's, and a new Snow Removal Equipment (SRE) building constructed in 2009. FSE provides a connection to the city and surrounding areas for General Aviation (GA) users.

FSE has identified the need to modify existing landside and airside facilities in order to accommodate demand for hangar space, improve aircraft circulation, and mitigate existing wildlife hazards. Modifications will be performed in a manner that considers that the current aircraft tie down area and runup pad will eventually need to be relocated out of the departure surface.

As part of the ongoing airport operations, FSE is continually investigating future needs, anticipating shortcomings and forecasting future operations. A Triggering Event Narrative Report (2018 TENR) was conducted in 2018 prior to this EA which analyzed these needs. The purpose of the TENR is to take a detailed look at existing airport inventory, forecast needs, and facility requirements. It then processes this information and develops multiple alternatives for growth to be considered. Ultimately, the TENR establishes a "preferred alternative", updates sheets on the Airport Layout Plan (ALP) and outlines a Capital Improvement Plan (CIP). The full TENR and ALP updates are located in Appendix D.

Prior to the TENR, a Wildlife Hazard Site Visit (WHSV) was conducted by the United States Department of Agriculture. The purpose of the WHSV was to inventory existing wildlife, identify hazards associated with wildlife, and recommend actions to correct the wildlife hazards. A report was developed as a result of this investigation and will be discussed further throughout this Environmental Assessment. The full WHSV is located in Appendix D.

The project purpose is to address the deficient hangar storage capacity, aircraft circulation, and mitigate exiting wildlife hazards in order to maintain a safe operating environment.

2.0 PROJECT NEED

General aviation (GA) represents all civil aviation activity not defined as commercial, including a variety of users and activities. Included in GA activities is flight training. FSE is unique to other airports of similar size because it serves as a popular flight training airport for the University of North Dakota (UND) pilot program, which alone has over 100 aircraft dedicated to flight training. Located 70 miles from the airport, UND is a comfortable distance for less experienced pilots to travel before conducting required instrument approaches. As a result, UND aircraft make up over 50% of FSE's enplanements each year resulting in a higher number of operations than other similar airports.

In addition to serving as a popular destination for training, FSE is also frequently used by the nearby industry. Located between the airport and City of Fosston, the Fosston Industrial Park was required to expand in 2018 by annexing additional adjacent property. The previous space was nearly at capacity. Businesses within the industrial park use the airport to transport both supplies and staff.

The 2040 Comprehensive Plan (Comp Plan) was recently completed in 2018, which is intended to act as a blueprint for community growth extending out to the year 2040. The plan analyzes goals, objectives, strategies and land use plans. It analyzes needs from various perspectives including housing, economic and land use goals which are beyond the scope of the TENR or other documents completed for the airport. The Comp Plan specifically addresses transportation and identifies the need for major improvements at the Airport within the next 5 years including pavement rehabilitation, environmental, and a new hangar area. It further arrives at long-term transportation goals to maintain and continue upgrading the Airport to best serve the community. The Comp Plan studies multiple major aspects of a viable community, but still prioritizes hangar development and other updates at the Airport. This demonstrates the need for hangar development and Airport updates are still a priority; even when compared to all aspects of the community.

Due to a hangar waiting list, there is a forecasted need for more hangars in the next five years. Growth at FSE is anticipated to be driven by constructing hangars to meet existing demand in the short term while long term growth is tied to local businesses. Methodology for this forecast is further described in 2.1 below.

As indicated in Section 1, the need for the proposed action is driven by the lack of hangar storage capacity, inadequate aircraft circulation, and wildlife hazard concerns. The following sections provide detailed explanations for each of these needs.

2.1 Hangar Storage Capacity

Fosston Municipal Airport (FSE) currently hosts a T-hangar with 6 individual spaces, a large box hangar, and 3 individual hangars for a total of 5 existing hangars with capacity for approximately 10 aircraft (Appendix B: Figure 2 - Existing Conditions). There are a variety of forecasting methodologies available, but for Fosston, the Trend Synthesis forecasting method was determined to be the preferred method because it allows for the consideration of local factors (2018 TENR). Exhibit 2-1 illustrates the forecasted growth in based aircraft. As illustrated on the exhibit, the number of based aircraft is forecasted to increase from 11 to 15 (14 FAA-Based, 1 Other = 15 Total) by the year 2022.

Exhibit 2-1: Based Aircraft - Trend Synthesis

Year	Single	Multi	Turboprop	Jet	Helicopter	Other	Sport	Total	FAA Based Aircraft
2017	7	1	0	0	1	1	1	11	10
2022	9	1	1	0	1	1	2	15	14
2027	9	1	1	0	1	1	2	15	14
2032	10	1	1	0	2	1	3	18	17
2037	10	1	1	1	2	1	3	19	18
CAGR	1.80%	0.00%	N/A	N/A	3.53%	0.00%	5.65%	2.77%	2.98%

Sources: 2018 TENR, 2013 MN SASP

Based aircraft have remained steady at FSE for the past decade, but research indicates this is a result of limited hangar capacity rather than lack of demand. No new hangars have been constructed in the last 20 years and FSE routinely receives inquiries for hangar space. Based aircraft at the airport are predicted to initially spike when hangars become available, then taper off and match forecasted growth once existing demand is met (2018 TENR).

The number of based aircraft already matches available hangar space. Interest in hangar space also demonstrates a need for additional hangars within the next five years. Growth at FSE is currently constrained by available hangar space and is projected to be initially driven by the construction of new hangars until hangar space catches up with demand. An assessment of hangar demand used existing data to determine the amount of hangar space required for each type of aircraft. Projections from the 2018 TENR identifies the square footage of forecasted hangar space needed, and the resulting projected based aircraft that space could support. Exhibit 2-2 shows the results of the assessment and the projected deficit of hangar space exceeding 10,000 square feet by 2021. As illustrated by the exhibit, the current deficit is 1,900 square feet, which is only projected to increase over time.

Exhibit 2-2: Hangar Demand

Aircraft Type	2017	2022	2027	2032	2037
Single Engine (Including Sport/Other)					
Projected Based Aircraft	9	12	12	14	14
Total Hangar Demand	12,600	16,800	16,800	19,600	19,600
Multiengine and Helicopters					
Projected Based Aircraft	2	2	2	3	3
Total Hangar Demand	5,000	5,000	5,000	7,500	7,500
Turbine Aircraft					
Projected Based Aircraft	0	1	1	1	2
Total Hangar Demand	0	4,000	4,000	4,000	8,000
Grand Total					
Hangar Space Available	15,700	15,700	15,700	15,700	15,700
Hangar Space Demand	17,600	25,800	25,800	31,100	35,100
Space Difference	**-1,900**	**-10,100**	**-10,100**	**-15,400**	**-19,400**

Source: 2018 TENR

2.2 Aircraft Circulation

Although the number of single engine aircraft nationwide is predicted to slightly decrease, single engine aircraft are expected to remain stable at FSE. As previously discussed, UND aircraft make up a majority of operations at the airport which are primarily within this category. An estimated 8,345 operations occurred in 2017 which is much higher number than other airports of similar size. Exhibit 2-3 illustrates the existing and forecasted aircraft operations at FSE.

Exhibit 2-3: Aircraft Operations

Year	Aircraft	Operations
2017	11	8,345
2022	15	11,370
2027	16	12,125
2032	17	12,880
2037	19	14,390
CAGR	2.77%	2.76%

Source: 2018 TENR

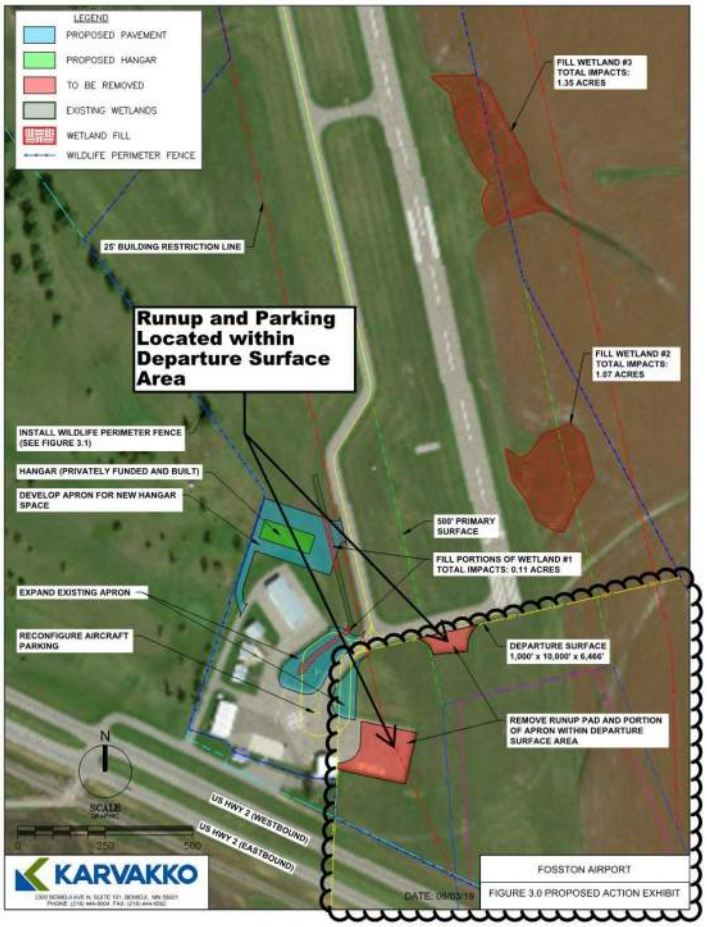


Exhibit 2-4 Non-conforming Areas

With pavement requiring future maintenance and operations increasing, Nonconforming movement areas on the apron need to be brought up to current FAA design standards at the time of significant pavement rehabilitation projects. Aircraft parking and a run-up pad are located within the departure surface area of runway 34. The run-up pad can be removed without replacement, but additional aircraft parking will need to be provided before removing the existing aircraft parking in the departure surface. Exhibit 2-4 illustrates the non-conforming areas located within the departure surface area along with the additional pavement proposed to accommodate conforming aircraft parking and taxilane movement areas. (Appendix B: Figure 3.0 shows a larger scale image and detailed look at the proposed layout).

Fosston also currently has a non-conforming access to the taxiway and runway. There is only a single access to the taxiway, which creates a "bottleneck" in circulation between the apron and taxiway. The access also extends directly to the runway, which is in conflict with current design standards that require a pilot to turn before accessing the runway. An additional access to the runway is needed and the eventual removal of the direct access to the runway.

2.3 Wildlife Hazard Concerns

In addition to hangar space and conforming to airport design standards, wildlife hazard concerns also have become more apparent. Duane P. Sahr, wildlife biologist with the USDA, was contacted to visit the airport first in 2008 and again in 2017. The purpose of each site visit was to inventory existing wildlife and identify potential hazards and risks. Results from these visits identified various wildlife that inhabit the wetlands including white-tailed deer, coyote, waterfowl and blackbirds, are an acute hazard to airport operations. Ouff Lake is located to the northwest of Runway 16. It is rich with an abundance and diversity of wildlife. The perimeter of the lake includes shrubs, tall grasses and thick wildlife cover providing one of the few sources of habitat for the surrounding wildlife. Most other areas around the airport are agricultural farm field. (Appendix B: Figure 4 – Wildlife Corridors & Habitat). Ouff Lake itself was not identified as an acute concern. Most wildlife in the wetlands surrounding the lake remain a safe distance from airport operations. However, wetlands 2 and 3, located adjacent to Runway 34 were identified as an acute concern (Exhibit 3-0). Both wetlands were identified as Type 1: Seasonally Flooded Wetlands. Wetland 2 totals 1.07 acres and Wetland 3 totals 1.52 acres. Habitat associated with this type of wetland is tall and dense, often with open areas of standing water during portions of the growing season.

Any wildlife startled in the wetlands is likely to travel toward the larger habitat surrounding Ouff Lake, and cross Runway 34. Because of the close proximity of each of these wetlands to the Runway, pilots would have little time to react if wildlife were to cross the Runway.

Deer strike (Image Credit: Google)

Deer and other Mammals: Similar to other unfenced general aviation airports, white-tailed deer were immediately identified as a wildlife hazard in the 2018 Wildlife Hazard Site Visit Report, (WHSV). The most recent FAA/USDA report of Wildlife Strikes to Civil Aircraft in the United States indicates that white-tailed deer were involved in 28% of all documented terrestrial mammal strikes from 1990-2015. Deer pose a significant threat to both human and aircraft safety nationwide when they can access Aircraft Operating Areas (AOA). The wetland complex surrounding Ouff Lake and adjacent agricultural field are preferred habitat for white-tailed deer. The species tends to bed in the dense cover of the wetlands and then feed in agricultural fields. If spooked, white-tailed deer are fast runners with little predictability. Furthermore, the deer tend to feed in groups during the low light conditions of dusk and dawn when pilots will have a hard time seeing the animals. In addition to white-tailed deer, coyote and other small mammals were identified as a risk. In fact, a coyote was observed running from Wetland #3 across the runway during the site visit. In order to maximize safety at the Fosston Airport, deer and other ground mammals will need to be prevented from accessing the AOA. The WHSV specifically recommended a perimeter fence, but other options are available that will be reviewed later in the Alternatives.

Birds near runway (Image Credit: Google)

Waterfowl and other Hazardous Birds: According to the most recent FAA/USDA report of Wildlife Strikes to Civil Aircraft in the United State, birds have been involved in 95.8% of all wildlife strikes to civilian aircraft in the US from 1990-2015. The waterfowl hazard is compounded by the two wetlands adjacent to Runway 34 (Wetlands 2 and 3) because waterfowl flying between the wetland and Ouff Lake fly directly across Runway 16-34 at low elevation. Any waterfowl nesting in those wetlands have easy access to the adjacent airfield for feeding in the short grass. Several species of waterfowl were observed during the wildlife surveys. The report specifically indicates observing a pair of mallards flying across the runway after leaving Ouff Lake, and landing at the edge of one of the wetlands adjacent to the east side of the airfield (either Wetland 2 or 3).

In addition to waterfowl, blackbirds were specifically identified as an acute hazard to aviation safety at the airport. Blackbirds fly back and forth across the runway between cattail marshes along the shore of Ouff Land and Wetlands 2 & and 3. During the fall migration, large flocks of blackbirds form and migrate through this area posing an increased risk to aircraft.

Wetland 3 provides dense habitat for wildlife directly adjacent to Runway 34 (Photo by Karvakko)

Habitat Modification: The wildlife hazard site visit specifically identified wetlands as a hazard to aircraft at the airport. Wetlands, in general, are attractive to wildlife because they provide food, water and shelter to a variety of wildlife species. For this reason, USDA Wildlife Services generally discourages having any type of wetland in close proximity to the AOA on an airport, and strongly discourages having wetlands within the AOA.

The WHSV report (2018) indicates that wetlands 2 and 3 pose an acute hazard. The vegetation within the wetlands is large enough to provide cover for medium to large mammals such as coyotes and deer. Any wildlife startled from these wetlands would likely cross the runway to get to the cover along Ouff Lake. Having these wetlands such a short distance from the runway creates a highly hazardous situation. Deer, coyotes, waterfowl, shorebirds and other wildlife using these areas for cover could easily be spooked by aircraft taking off or landing. Due to the short separation distance of the wetlands from the runway, pilots would have very little reaction time to avoid striking wildlife crossing the runway.

It is important for both pilot and animal safety that these corridors are somehow revised to prevent travel intersections and reduce the likelihood of wildlife strikes.

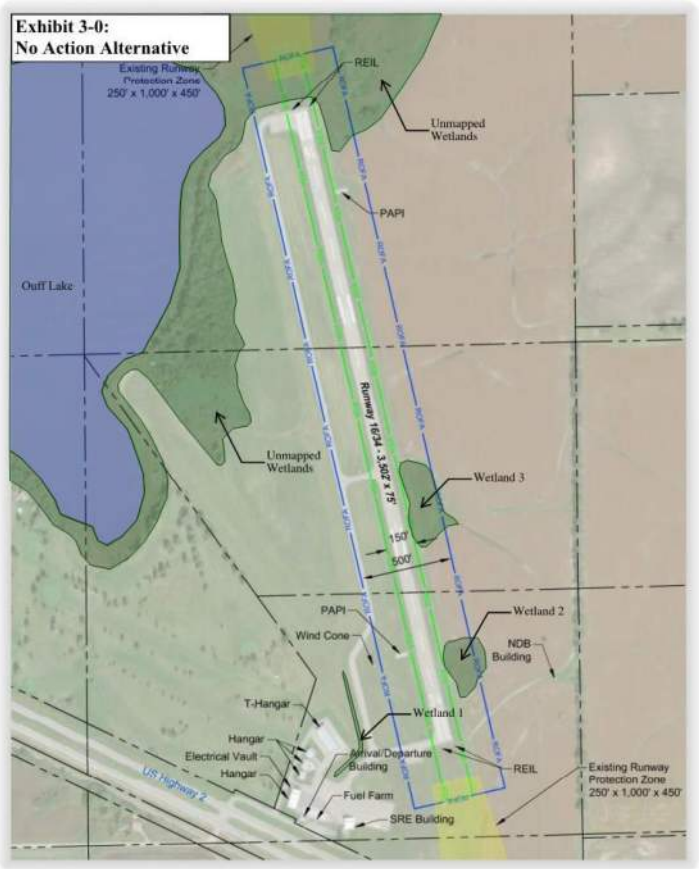
3.0 ALTERNATIVES

The TENR focused on airport layout and hangar demand. It identified four potential alternatives in order to address the identified needs at the airport. The WHSV focused on hazards at FSE associated specifically with wildlife. It identified alternatives to address wildlife hazards.

3.1 Airport Layout and Hangar Alternatives Considered

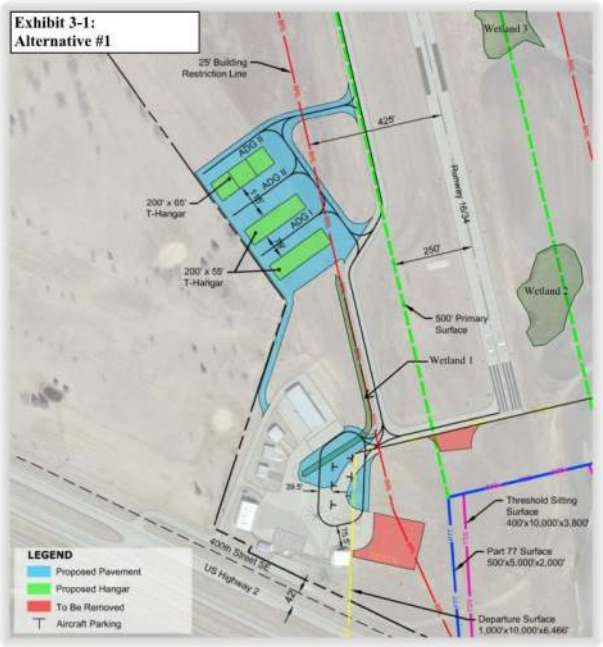
- **No Action Alternative:** The No Action Alternative consists of the existing facilities shown Exhibit 3.0 below.

The No Action Alternative would not result in additional impacts, but would also not achieve the purpose and need. Hangar space would remain at a shortage, FAA design standards would not be met, and wetlands located adjacent to Runway 34/17 would still encourage wildlife hazards to travel across the runway. Growing hangar demands would not be met and development would not align with the short-term goals.



- **Alternative #1:**
  Alternative #1 allows existing facilities to remain and proposes expanding to the north as shown on Exhibit 3-1 below.

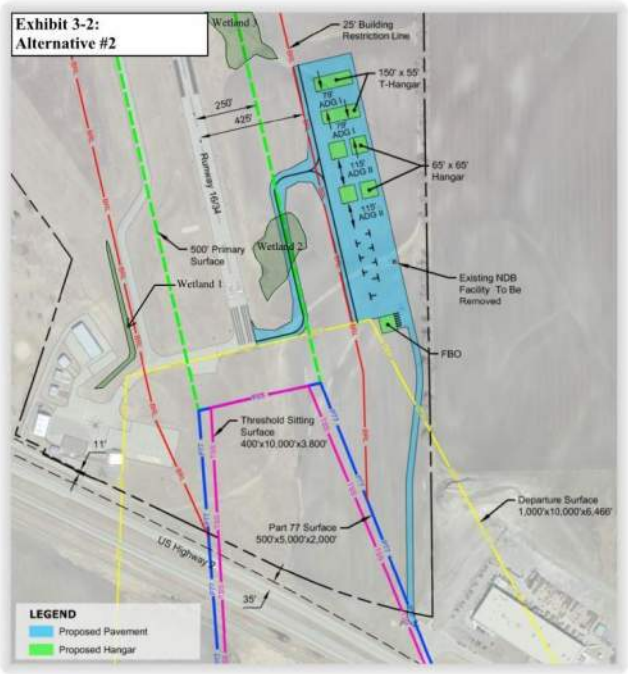
This alternative would prioritize existing facilities while addressing FAA design requirements and hangar capacity issues. All current hangars would remain in their existing configurations to minimize interference with current tenants and operations, while new hangars would be constructed on the greenfield site to the north of the terminal area.



The existing apron would be reconfigured by removing the east portion and expanding to the north. As a result, aircraft parking would be provided along the eastern edge of the expanded apron, which would be outside the departure surface, so parked aircraft would not penetrate the surface. Additionally, there would be room for aircraft, vehicles, and SRE equipment to maneuver on the western side of the ramp while leaving the self-service fuel area unobstructed.

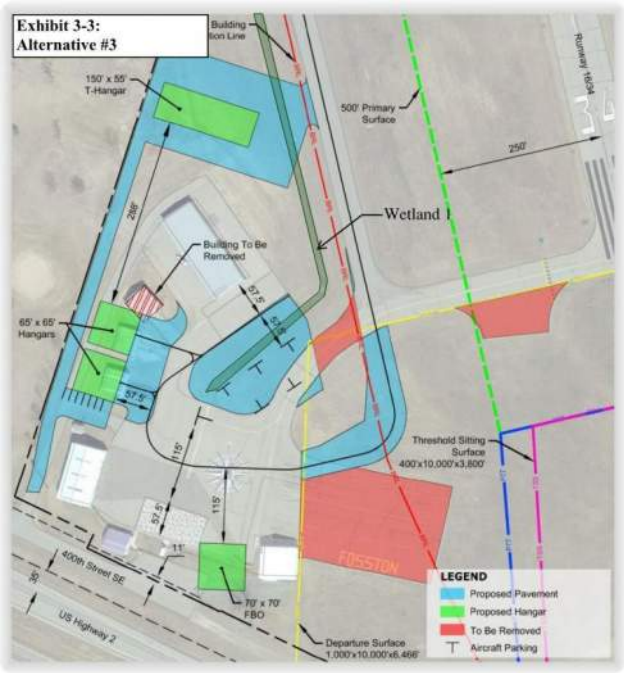
This alternative would leave most existing facilities in place, which would simplify construction and phasing. However, it would not address the inefficient building layout. To maximize building layout efficiency, buildings should be parallel to the taxiway and be spaced according to appropriate setbacks. This allows the maximum number of hangar spaces in a given area. Existing buildings are located near Highway 2 in a desirable location. Any additional hangars would need to be constructed north of the existing area in less desirable areas. Buildings are nearing the end of expected life and will need replacement in the near future. A new layout should be considered and implemented once the buildings are fully depreciated. Therefore, this alternative was dismissed.

- **Alternative #2:** This alternative considered developing a new terminal area east of the runway. The alternative considered aircraft parking and box hangars with an angled taxiway attached to Runway 34. Exhibit 3-2 below shows the proposed alternative.



Although this alternative would have few facility constraints, it would introduce several circulation difficulties and result in potentially unsafe conditions. Traffic using the parallel taxiway would be required to cross the runway causing potential conflicts with planes during takeoff and landing. Additionally, aircraft based on the east side of the runway would need to cross the runway in order to reach the self-service fuel. Finally, the alternative would only include a single access to the runway at the south end, rather than on both ends. The single access would lead to traffic congestion. The operational issues and comparative cost of construction outweigh advantages to this alternative. Therefore, this alternative was dismissed.

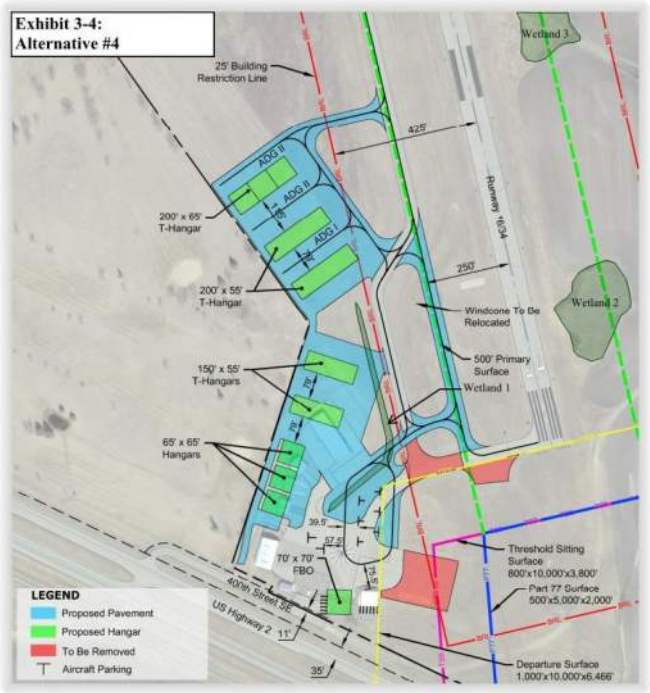
- **Alternative #3:**
This alternative considered aligning facilities along a common axis to make more efficient use of existing space as shown on Exhibit 3-3 below.



The parallel taxiway would be extended in order to eliminate the direct access from the apron to the runway. Similar to Alternative #1, the run-up pad would also be removed. This alternative also considered constructing a T-hangar north of the existing hangars with the intention of allowing individual hangars to relocate prior to removal of existing hangars.

This layout would improve the building layout over time and also eliminate hazards associated with the direct access from apron to runway. However, this layout could lead to congestion during busy periods since it would have only limited areas for aircraft to reverse direction or stop temporarily. The alternative would also result in aircraft passing under the departure surface when circulating through the area. For these reasons, this alternative was dismissed.

- **Alternative #4:**
  Alternative #4 resolves existing issues, expands hangar capacity, and improves the long-term circulation at the Airport. The alternative is shown on Exhibit 3-4 below.



The apron would be reconfigured to relocate aircraft parking outside the departure surface. The reconfigured apron would result in conforming taxilane movements through the apron, as well as improve circulation in this area by allowing easy access to aircraft fueling and tenant hangars. Removal of a portion of the existing apron would prevent parked aircraft from penetrating the departure surface, while also preserving access to the SRE building.

FSE would develop the additional apron space north of the existing facilities. The construction of an additional apron would allow space for more hangars to be privately developed. The new apron would have the ability to service larger aircraft, such as multi-engine or turbine aircraft. The apron would accommodate projected short-term demand and anticipated fleet mix, as turbine aircraft are anticipated to become more common.

Another key advantage to this alternative is that existing hangars can remain until the buildings fully depreciate. Once the existing hangars are fully depreciated and ready for removal, tenants will have the option to rebuild in the approximate same location (see Exhibit 3-4), or they may choose to remove the existing building and rebuild to the north in one of the proposed new hangar locations. If the tenant chooses to move to the north, the existing building will be removed. The space will be cleared and become available for a new tenant.

3.2 Wildlife Hazard Alternatives considered

The following alternatives were considered in relation to the wildlife hazard concerns at the airport.

- **Fencing Around Wetlands-Only:**
  Fencing around the wetlands was considered as an alternative, but would only be effective with mammals and ground species. A fence would not prevent birds from using the wetlands. In addition, the fence would need to be located well within the building restriction line (BRL). For these reasons, this alternative was dismissed.

- **Wildlife Hazing:**
  Another alternative considered was hazing of the wildlife in the wetlands. This would include non-lethal methods, such as propane exploders, distress calls, and raptor silhouettes. This method would be effective with all species, including ground mammals and birds, but only in the short term. Hazing methods lose effectiveness as wildlife become familiar with them. The airport is also located near the City of Fosston and the loud noises associated with the propane exploders and distress calls would be a nuisance for residents living near the airport. For these reasons, the hazing alternative was dismissed.

A propane exploder used for non-lethal wildlife hazing (Image Credit: Google)

- **Lethal Control:**
  Lethal control was also considered as an alternative. While it would not be used as a stand-alone solution, it would be used to supplement the hazing alternative. Permits can be obtained to lethally remove mammals, such as white-tailed deer, from the Minnesota Department of Natural Resources. Fosston Municipal Airport is not staffed full time, and lethal control would require a full time position. For these reasons, lethal control was dismissed as an alternative.

- **Wildlife Netting:**

Wildlife netting was also considered for hazard mitigation. It would provide an immediate barrier with little or no impacts to the wetlands. Installing a net over the entire wetland was considered, but with two wetlands totaling 2.59 acres, it would be difficult and expensive to find nets large enough to cover the area. Furthermore, the net would likely require frequent maintenance. It could also pose a risk to wildlife that become trapped in the net. The additional risk, costs and difficulties outweigh the benefits. For these reasons, the option of placing a netting over the wetland was dismissed.

Seagull trapped in nylon netting (Image Credit: Google)

- **Wildlife Perimeter Fence (Entire Perimeter of Airport):**

3-strand outrigger (Image Credit: Google)

A wildlife fence located around the perimeter of the airport would effectively prevent ground mammals from entering the AOA. The WHSV conducted by USDA recommended increased safety parameters due to mammal/ungulate presence. As a result, USDA recommends installation of a 10-12 foot chain-link fence topped with 3 strand barbed wire (See WHSV located in Appendix D). Of all the ground mammals identified in the report, the white-tailed deer have the ability to jump the highest. Therefore, the fence would need to be tall enough to prevent the species from jumping. Both the FAA and the WHSV report recommend a 10-12 foot chain-link fence topped with 3-strand barbed wire outriggers to minimize deer accessing aircraft movement areas. In some cases an 8-foot chain link fence with 3-strant barbed wire outriggers may be sufficient to prevent most deer access to these areas. A 4 foot apron or skirt may also be buried along the outside of the fence to further exclude digging mammals such as coyotes and to help prevent gaps under the fence due to frost heaving. FAA recommends installing wildlife fence around the entire perimeter of the aircraft movement area with no gaps greater than 6 inches, including gates and under the fence.

Wildlife perimeter fencing appears to be an effective alternative for Fosston Municipal Airport. It would effectively prevent the ground species of wildlife identified in the WHSV from entering the aircraft movement area. However, it does not prevent birds from passing into the area.

- **Wetland Removal:**

A wetland delineation was conducted at Fosston Municipal Airport in 2018. The wetland delineation area encompassed the proposed development areas and approximately a 600 foot corridor along the southern half of Runway 34/17. Figure 5 shows 3 wetlands were identified totaling 2.79 acres. The full report can be found in Appendix D.

Wetlands 2 and 3 are Type 1 (seasonally flooded) wetlands, but they are both more saturated, so vegetation cannot be routinely mowed. The taller vegetation provides habitat for several species of wildlife, including birds. In the WHSV report, USDA recommended the consideration of removing these two wetlands.

Removal would alleviate wildlife hazards by eliminating the tall vegetation and standing water that currently is providing wildlife habitat. Whereas the wildlife perimeter fence only prevents ground mammals from entering the aircraft movement area, removing wetlands will discourage the birds and waterfowl from entering the area.

While still maintaining existing drainage in the area, fill will be placed in wetlands in order to prevent water from pooling in these areas. This will allow staff to access the areas with the necessary equipment to mow the vegetation. These habitat modifications would effectively eliminate the current

wildlife hazard concerns.
A linear drainage swale will remain through the existing wetland areas in order to prevent disturbing the current drainage patterns. The swale would likely retain wetland characteristics, but should drain well enough that equipment will be able to routinely mow the swale bottom during dry seasons.

Prior to removing any wetlands, permitting will be required. Wetlands are protected from impacts at the State level by the Wetland Conservation Act (WCA) and also at the Federal level by the Clean Water Act (CWA). Both of these have a list of requirements in order to first avoid wetland impacts, and second, to ensure any unavoidable impacts are compensated. A notice of decision was received on August 21st, 2019 from the East Polk Soil and Water Conservation District (Appendix D) with regards to the Minnesota Wetland Conservation Act. A notice was also received September 23rd, 2019 from the US Army Corps of Engineers (Appendix D) with regards to the Corps of Engineers 87 manual. Each of the notices verified the wetland boundaries and total size. Prior to any removals, a preliminary jurisdictional determination and request for wetland impacts will be submitted. A 404 Wetland Permit and Mitigation Plan will need to be approved prior to any impacts to these wetlands. The wetlands are located in the Red River of the North-Sand Hill River Watershed, Bank Service

3.3 Proposed Action

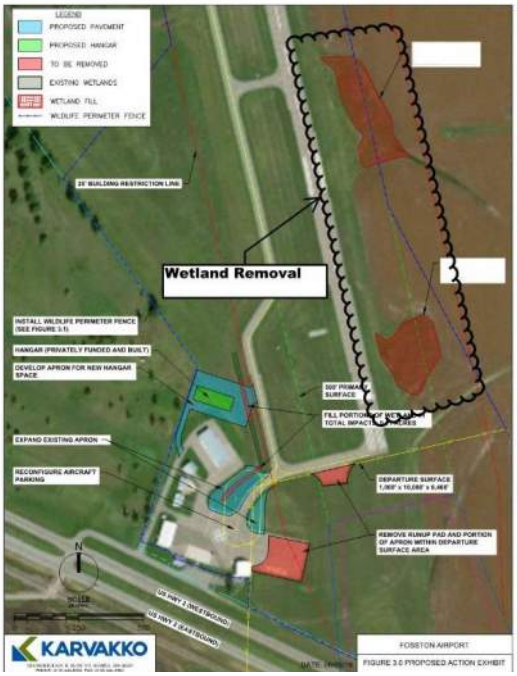


Exhibit 3-5 Wetland Removal

After consideration of the potential alternatives, Fosston Municipal Airport has chosen Alternative #4 as the preferred layout alternative. However, the Proposed Action will scale back the scope of work originally reviewed in Alternative #4. Fosston believes this is a more accurate amount of development that is "ripe" for development. The TENR reviewed proposed alternatives extending to 2030 and beyond. Alternate #4 includes the removal of four buildings, along with the construction of eight new hangars. Fosston will phase into this design, by only developing a single hangar within the next five years. No building removals are proposed for the Proposed Action. Fosston has also chosen both wildlife perimeter fence and wetland filling as the preferred wildlife hazard alternatives. Figure 3.0 and 3.1 located in the appendices of this document provide detailed illustrations of the Proposed Action. The following is a breakdown of how Fosston intends to achieve the proposed action.

Wildlife hazards have surfaced as the highest priority for Fosston and will therefore be addressed before further development. In a letter (see Appendix A) from USDA during consultation, Duane Sahr (Certified Airport Biologist) states "In the report, I recommended the removal of the two small wetlands that are adjacent to the airfield on the east side of Runway 16-34 The removal of these wetlands would certainly not eliminate the risk of waterfowl strikes by aircraft at KFSE due to several other wildlife attractants in the area, such as agricultural fields, wastewater treatment ponds, and other temporary and permanent water attractants. However, due to the attractiveness of the two wetlands to waterfowl and other wildlife, combined with the close proximity of these wetlands to the airfield, the removal of the wetlands would be an important incremental step to reduce wildlife (especially waterfowl) hazards at KFSE." As recommended by USDA in the WHSV report, and as analysis within this document has indicated appropriate, Wetlands 2 and 3 will be removed as illustrated on Exhibit 3-5. (For details and a

full-size image, see Appendix B; Figure 3.0) There will be a total of 2.59 acres of impacts and both wetlands will be determined as jurisdictional requiring mitigation. Wetland impacts will be mitigated using the wetland banking method.

In order to remove the wetlands, subsoil from the surrounding uplands will be relocated into the wetland areas. Topsoil will first be removed and stockpiled away from the required excavation area. Once topsoil is removed, subsoil will then be pushed into the wetland areas with heavy equipment and contoured to allow drainage. When the desired subsurface contours are established, the salvaged topsoil will then be placed over the excavated areas and stabilized with vegetation.

Image (below)
Wetland 3, which is planned for removal.

Finished grade of the excavated areas will allow drainage without encouraging standing water. Wetland 2 will be sloped to the west into the existing ditch along Runway 34. Wetland 3 will be regraded and slope inward in order to allow the existing swale from the southeast to also reach the existing ditch along Runway 34. Proposed drainage is depicted on Figure 3.0 in Appendix B. Removal of the wetlands will alleviate concerns associated with the waterfowl and birds in the wetland area. It will complete the first of two required actions necessary to alleviate wildlife concerns at Fosston Municipal Airport. With the wetlands adjacent to the runway remove, pilots will no longer need to be concerned about birds or mammals frightening out of the wetlands and passing over the runway. However, until a wildlife perimeter fence is installed, mammals will still have access to the AOA posing the risk of potential wildlife strikes.

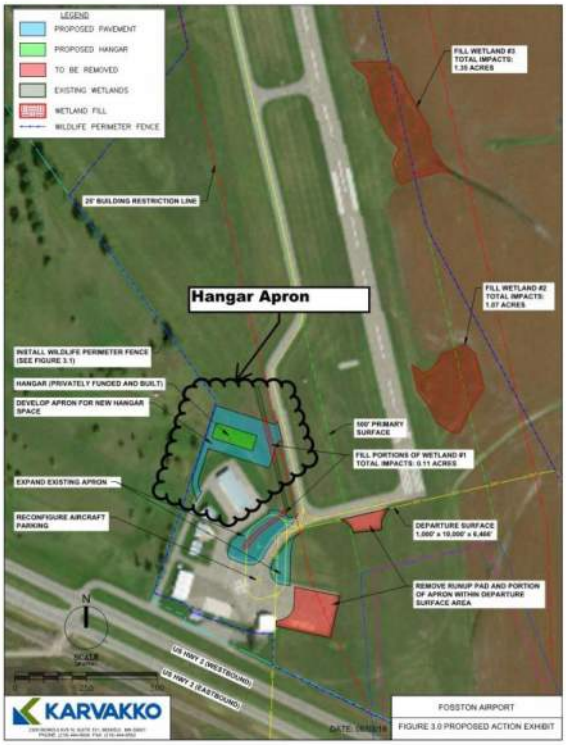


Exhibit 3-6 Hangar Apron

The Proposed Action will focus on addressing the hangar demand at the airport. Exhibit 2-2 illustrates an existing shortage of hangars space, which is projected to continually increase. A shortage of 10,100 square feet is projected in the next 5 years with the current conditions. Development of a hangar and apron will alleviate the shortage. Hangars at Fosston Municipal Airport are privately owned, and the land for the buildings are leased for a small fee. By allowing Fosston to provide reasonable hangar fees, and avoiding large costs associated with hangar maintenance, this method has served Fosston well in the past.

Work will include the design, development and construction of a new hangar, apron, and taxilane access. Work will be located north of the existing hangars. The hangar building and surrounding apron will be designed and constructed privately, according to the proposed layout. Prior to development of the hangar, a 25' wide taxilane will be constructed north of the propose hangar. The taxilane access will be constructed of bituminous and provide an additional connection to the taxiway, which will improve circulation. The hangar owner will then be responsible for connecting any portions of taxilane to the apron and building.

Construction of the taxilane will result in minor impacts to Wetland 1. However, the impacts will be less than one tenth of an acre and the impacted wetland is a constructed ditch. *The photo (right) is Wetland 1 from the south.* It shows the wetland is a ditch constructed west along the Taxiway. We do not anticipate any permitting, or mitigation requirements for wetland impacts associated with the apron development.

The additional hangar space will allow Fosston Municipal Airport to meet the existing demand. As illustrated and discussed in Alternative Layout #4, it also allows for continued expansion to the north, as demand increases.

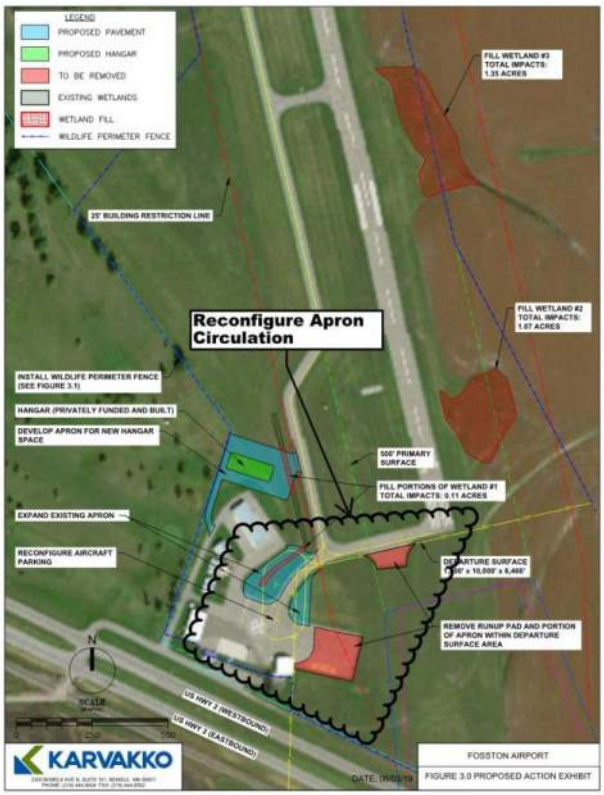


Exhibit 3-7 Remove nonconforming structures

The proposed action also includes redevelopment of the apron circulation area, including the design, bidding and construction phases.
The portion of the apron located in the departure surface does not meet FAA design standards. Since these portions of apron are nearing the end of their useful life, they will be removed. Lost apron space will be accounted for by infilling and expanding the existing apron to the north. Aircraft parking will be relocated to the expanded apron in order to remove it from the departure surface area. The result will be a large apron with easy access to the hangar areas and space to relocate aircraft parking. This relocated parking area will be designed with six tie downs for smaller single engine aircraft, which will accommodate the forecasted need within the next 5 years.

The expansion of the apron will result in minor impacts to Wetland 1. Similar to impacts anticipated from the hangar apron, wetland impacts will be minor and no permitting or mitigation is anticipated.

Because there aren't conforming taxilanes, a fueling aircraft can delay traffic from accessing the airfield or other locations within the building area. The reconfigured apron will improve circulation in this area by allowing easy access to aircraft fueling and tenant hangars. The additional pavement will also provide efficient circulation around the relocated aircraft parking.

The Proposed Action also includes a second step of the wildlife hazard mitigation. Wetlands are estimated for removal in 2020 to eliminate concerns related to birds and the tall wetland vegetation encroaching the runway. However, the runway will still be fully accessible to deer and other wildlife. As recommended by USDA in the WHSV, a wildlife perimeter fence will be installed around the airport.

Posts for the fence will be pounded into the ground using mechanical equipment to an estimated depth of 4' below the surface. Posts located in wetland areas will be installed using the same methods, but will be pounded to whatever depth necessary to achieve stability. To avoid rutting or other impacts to wetlands caused by the equipment, timber mats will be used, or work will be completed while conditions are frozen. Because posts do not alter hydrology or vegetation, they are not considered an impact to wetlands.

The completion of the wildlife perimeter fence, in addition to wetland removals will fully achieve recommendations from USDA in the WHSV report, and dramatically reduce any potential wildlife hazards at Fosston Municipal Airport.

Exhibit 3-8 Wildlife Perimeter Fence

4.0 Affected Environment/ENVIRONMENTAL CONSEQUENCES

4.0 Summary

This section assesses the environmental impacts of the proposed action and no action alternatives, in accordance with the policies and procedures contained in FAA Order 5050.4B (issued April 28, 2006) and FAA Order 1050.1F (Issued July 16, 2015), for compliance with the National Environmental Policy Act (NEPA) and implementing regulations issued by the Council on Environmental Quality (CEQ) found in 40 CFR parts 1500-1508. FAA Order 1050.1F provides direction on using the NEPA review process to ensure compliance with other environmental laws, regulations and executive orders that may be applicable to proposed FAA actions.

The Fosston Municipal Airport is located on the western edge of Fosston in Polk County, Minnesota less than one mile from downtown. The airport encompasses approximately 285 acres of City-owned property. Adjacent property uses consist of the Fosston Golf Club to the west, US Highway 2 to the south and the Fosston industrial park to the east. A body of water approximately 60 acres named Ouff Lake and a series of wetlands are located to the northwest of the airport beginning immediately adjacent to the north end of the runway. Rural Fosston is primarily farmland and beyond the existing developments within the City, the airport is primarily surrounded by farmed crop land which is easily identified on aerial imagery. (See Figure 1: General Location Map) When viewing the aerial imagery, the City wastewater treatment facility is also easily identified less than 1 mile east of the airport.

Table 5.1 is a summary of the Environmental Consequences and each environmental section is described in detail following the table.

Table 5.1: Comparison of Alternatives		
Impact Category	**Impact**	
	No Action (Compared to Existing Condition)	**Proposed Action (Compared to No Action)**
Air Quality	None	No significant impact
Biological Resources	None	No effect
Climate	None	No significant impact
Coastal Resources	None	None
Department of Transportation Act, Section 4(f)	None	None
Farmlands	None	None
Hazardous Materials, Solid Waste, and Pollution Prevention	No adverse effect	No adverse effect
Historical, Architectural, Archaeological & Cultural Resources	None expected	None Expected
Land Use	No impact	No impact
Natural Resources and Energy Supply	No adverse effect	No adverse effect
Noise and Noise-Compatible Land Use	No significant impact	No significant impact
Socioeconomic Impacts, Environmental Justice and Children's Environmental Health & Safety Risks	None	None
Visual Effects	No significant impact	No significant impact
Water Resources (include sections from wetlands, floodplains, water quality and wild and scenic rivers sections)	No significant impact	Impacts proposed, but mitigated through wetland credits.

4.1 Air Quality

Regulatory Setting:
Two primary laws apply to air quality: NEPA, and the Clean Air Act (CAA). As a Federal agency, the FAA is required under NEPA to prepare an environmental document for major federal actions that have the potential to affect the quality of the human environment, including air quality. The CAA established National Air Quality Standards (NAAQS) for six pollutants, termed "criteria pollutants." The six pollutants are: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM-10 and PM-2.5), and sulfur dioxide (SO_2).

Affected Environment:
The CAA requires each State to adopt a plan to achieve the NAAQS for each pollutant within timeframes established under the CAA. These air quality plans, known as State implementation plans (SIP), are subject to Environmental Protection Agency (EPA) approval. Therefore, federally sponsored airport development in Minnesota must conform with the Minnesota State Implementation Plan (SIP) as specified in 40 CFR part 93, subpart B and Part 51, Subpart W – *Determining Conformity of General Federal Actions to State or Federal Implementation Plans*. Conformity required under section 176(c) of

the Clean Air Act (CAA) applies to all Federal actions in designated nonattainment and maintenance areas. The proposed project is not located in a non-attainment or maintenance area for a criteria pollutant in the Minnesota State Implementation Plan (SIP). A general conformity determination is therefore not required.

A comparison of the proposed project's resulting air quality with NAAQS should be considered if pollutant levels are likely to exceed the NAAQS. The number of passengers at larger commercial airports and the level of general aviation and air taxi operations at smaller airports are likely to be good indicators of potential pollutant concerns. Cars and aircraft emit moderate amounts of CO while they are idling or taxiing. Therefore, significant road congestion and ground delays could potentially cause CO emissions to approach the NAAQS. The project is not anticipated to result in road congestion, or ground delays.

Construction operations are also a potential concern for air pollution. Heavy equipment has the potential to emit moderate amounts of CO while they are performing construction operations. Therefore, large numbers of heavy equipment operating for long periods of time could potentially cause CO emissions to approach the NAAQS. The proposed actions will require heavy equipment, but the magnitude of the project is only anticipated to require minimal pieces of equipment. Furthermore, construction with the heavy equipment is not anticipated to require a long duration of time which will minimize the potential for pollutants. Finally, construction will be monitored by the airport consultant and equipment will not be allowed to idle for periods of time exceeding 1 hour. CO emissions resulting from construction operations are not anticipated to approach the NAAQS.

The FAA Order 1050.1F Desk Reference (July 2015) is designed to complement FAA Order 1050.1F and should therefore be used in conjunction with the Order. Section 1.3.3 of the Desk Reference states that "There is no single, universal criterion for deciding whether an ambient pollutant concentrations analysis (or NAAQS analysis) is necessary for Federal actions. However, a review of a project to identify any unusual circumstances, such as intense emission sources in close proximity to areas where the public has access, might indicate a need for further analysis." Investigations have not indicated the likelihood of unusual circumstances, or intense emission sources. Based on this guidance, a NAAQS analysis is therefore not required.

Environmental Consequences:
For the reasons described above, there are no significant air quality impacts associated with either the preferred alternative or no-action alternative. Idle times for construction equipment will be limited to 1 hour. The distance aircraft needs to taxi to reach runway is minimal and low congestion results in very little idle time from planes during takeoff and landings.

5.2 Biological Resources

Regulatory Setting:
Section 7(a)(2) of the Endangered Species Act (ESA) requires Federal agencies, in consultation with the Services (US Fish & Wildlife Service (USFWS) and/or National Marine Fisheries Service (NMFS), to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of a listed species of result in the destruction or adverse modification of designated critical habitat. Coordination is to be initiated with the USFWS or the NMFS, as appropriate, to ensure the proposed action does not jeopardize the continued existence of the affected species. The ESA protects over 1,492 animals and plants in the United States. The USFWS breaks the species into regions, states and even counties which the species have, or potentially exist.

Affected Environment:

There are currently five species federally listed in Polk County by the USFWS. As of September 24, 2019, the Gray Wolf, Northern Long-eared bat, Dakota Skipper, and Western Prairie Finged Orchid were all listed as threatened. Poweshiek Skipperling is federally listed as endangered. Polk County is also listed as an area with Critical Habitat for the Dakota Skipper and Poweshiek Skipperling. See Table 3.

Table 3: Federally Threatened, Endangered and Critical Habitat Species identified in Beltrami County			
Common Name	**State Status**	**Federal Status**	**Habitat**
Gray Wolf		Threatened	Northern Forest
Northern Long-eared bat		Threatened	Hibernates in caves and mines, swarming in surrounding wooded areas in autumn. Roosts and forages in *upland forests during spring and summer.
Dakota Skipper		Threatened, Critical Habitat	Native prairie habitat
Poweshiek skipperling		Endangered Critical Habitat	Native Prairie
Western prairie fringed orchid		Threatened	Wet prairies and sedge meadows
***Indicates species in which preferred habitat has similar characteristics found on site.**			

None of the listed species are likely to inhabit the site because the site does not include preferred habitat for any of the listed species. The Northern Long-eared bat prefers dead trees for roosting. The Gray Wolf prefers northern forests. The site is located on an active airport with no trees or forest. Therefore, these species are not likely to inhabit the site. The Dakota Skipper and Poweshiek Skipperling prefer native prairie habitat. The site was historically a native prairie. However, airports are carefully managed with plants that are not inviting to wildlife. Additionally, the site is routinely mowed. The existing site is not the preferred habitat for either of these species. Therefore, the species are not likely to inhabit the site. The Western Prairie Finged Orchid prefers wet prairies and sedge meadows. If it were growing on the site, it would be located along the edge of the existing wetland. However, wetlands on this site are completely surrounded by annually farmed agricultural land or mowed runway turf. Therefore it is not likely to inhabit the site. The FAA Environmental Specialist made a no effect determination to all of the ESA species listed above on 22-January 2020 since airport environments preclude existence of all of these species.

Certain avian species are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the USFWS. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures. A report was conducted using the Information for Planning and Conservation (IPaC) website. The report indicates that no migratory bird species of concern are expected to occur at this location.

State-listed animal and plant species as threatened, endangered, or candidate must also be considered. The Minnesota Department of Natural Resources (DNR), Rare Species Guide identifies 29 State threatened or endangered species (See Table 4).

As previously mentioned, the Wildlife Hazard Mitigation Plan (WHMP) results in the majority of the area being routinely mowed, specifically to discourage wildlife and any plants that could potentially invite wildlife. The areas of the site which are not currently maintained are farmed. These areas consist of annual crops and drainage ditches. Virtually the entire site has been disturbed either from airport operations or farming. These conditions result in habitat which is extremely unlikely to include any of the species listed in Polk County. Table 4 below illustrates the identified listed species.

Table 4: State Threatened and Endangered Species identified in Beltrami County
29 result(s) for *Locations:Polk; minnesota endangered; minnesota threatened;*

Common name	Scientific name	Group	Federal status	State status
A Caddisfly	*Limnephilus secludens*	insect	none	endangered
Annual Skeletonweed	*Shinnersoseris rostrata*	vascular plant	none	threatened
Assiniboia Skipper	*Hesperia assiniboia*	insect	none	endangered
Baird's Sparrow	*Ammodramus bairdii*	bird	none	endangered
Beach Heather	*Hudsonia tomentosa*	vascular plant	none	threatened
Beaked Spikerush	*Eleocharis rostellata*	vascular plant	none	threatened
Burrowing Owl	*Athene cunicularia*	bird	none	endangered
Chestnut-collared Longspur	*Calcarius ornatus*	bird	none	endangered
Clustered Broomrape	*Orobanche fasciculata*	vascular plant	none	threatened
Dakota Skipper	*Hesperia dacotae*	insect	threatened	endangered
Eastern Spotted Skunk	*Spilogale putorius*	mammal	none	threatened
Fluted-shell	*Lasmigona costata*	mussel	none	threatened
Ghost Tiger Beetle	*Cicindela lepida*	insect	none	threatened
Goblin Fern	*Botrychium mormo*	vascular plant	none	threatened
Gray Ragwort	*Packera cana*	vascular plant	none	endangered
Hair-like Beak Rush	*Rhynchospora capillacea*	vascular plant	none	threatened
Handsome Sedge	*Carex formosa*	vascular plant	none	endangered
Indian Ricegrass	*Achnatherum hymenoides*	vascular plant	none	endangered
Loggerhead Shrike	*Lanius ludovicianus*	bird	none	endangered
Louisiana Broomrape	*Orobanche ludoviciana* var. *ludoviciana*	vascular plant	none	threatened
Poweshiek Skipperling	*Oarisma poweshiek*	insect	endangered	endangered
Ram's Head Orchid	*Cypripedium arietinum*	vascular plant	none	threatened
Sandy Tiger Beetle	*Cicindela limbata nympha*	insect	none	endangered
Short Ray Fleabane	*Erigeron lonchophyllus*	vascular plant	none	threatened
Sprague's Pipit	*Anthus spragueii*	bird	none	endangered

Sterile Sedge	*Carex sterilis*	vascular plant	none	threatened
Western Prairie Fringed Orchid	*Platanthera praeclara*	vascular plant	threatened	endangered
Whorled Nutrush	*Scleria verticillata*	vascular plant	none	threatened
Wilson's Phalarope	*Phalaropus tricolor*	bird	none	threatened

Environmental Consequences:
In addition to investigating available online information, a Natural Heritage Information System (NHIS) Data Request Form was completed and submitted September 24th, 2019. The submittal included a description of the proposed work, along with other applicable information. A response was received from the Minnesota Department of Natural Resources December 13th, 2019. The response indicated the project is not likely to negatively affect any known occurrences of rare features. Documentation of these communications are located in Appendix A.

After analysis of the potential impacts to fish, wildlife and plants, researching the threatened and endangered species, informal consultation with the USFWS, and Minnesota DNR, the proposed action and no action alternatives are not likely to affect biological resources.

4.3 Climate

Regulatory Setting:
On August 1, 2016 the Council on Environmental Quality (CEQ) released a memorandum for Heads of Federal Departments and Agencies. The document is the most recent guidance available to assist Federal actions through the NEPA process.

Affected Environment:
In order to determine the potential consequences of a proposed Federal action, agencies must first determine a baseline. In regards to climate this is done by first considering the existing and long term climate of the no-action alternative. Results can then be compared to projected climate conditions with the proposed Federal action. The guidance also emphasizes the importance of the “rule of reason”, which allows agencies to use expertise and experience in addition to available information when making determinations of affect.

In terms of a baseline measurement for climate, airport operations currently produce emissions and would continue to produce emissions if the no action alternative were selected. Emissions are produced by aircraft using the facility, maintenance equipment such as lawn mowers and snow plows, and vehicle traffic on the site.

Emissions could possibly be increased if the number of aircraft were significantly increased, or the project resulted in longer idle periods while waiting for takeoff. The scope of the proposed project includes the addition of 1 new hangar building. The proposed hangar space is intended for general aviation (GA) purposes which do not typically increase airport operations significantly. Aircraft stored in this type of facility are typically not operated as often or routine as a commercial aircraft.

The proposed actions will require heavy equipment, but the magnitude of the project is only anticipated to require minimal pieces of equipment. Construction with the heavy equipment is not anticipated to require a long duration of time which will minimize the potential for pollutants. Construction will be monitored by the airport consultant and equipment will not be allowed to idle for long periods of time.

Environmental Consequences:
The proposed project is not anticipated to increase the amount of Greenhouse Gas (GHG) emissions. Neither the proposed project nor the no action alternative would have a significant impact on Climate.

4.4 Coastal Resources

The Fosston Municipal Airport is not within a federally designated coastal barrier area or coastal zone or coral reef area; therefore, analysis of the proposed project and no action alternative with respect to the Coastal Barriers Resources Act (CBRA), the Coastal Zone Management Act (CZMA), and Executive Order (E.O.) 13089, Coral Reef Protection is not applicable.

4.5 Department of Transportation Act, Section 4(f)

Regulatory Setting:
Procedural requirements for complying with Section 4(f) are set forth in DOT Order 5610.1C. The FAA also uses Federal Highway Administration/Federal Transit Administration (FHWA/FTA) Regulations in 23 CFR part 774 (73 Federal Register 13368 (March 12, 2008) and 73 Federal Register 31609 (June 3, 2008) and FHWA guidance (e.g., Section 4(f) Policy Paper, 77 Federal Register 42802 (July 20, 2012)). These requirements are not binding on the FAA; however, the FAA may use them as guidance to the extent relevant to aviation projects.

Affected Environment:
Section 4(f) properties include parks and recreation areas that are publicly owned and open to the public. Also included are publicly owned wildlife and waterfowl refuges. The entire property under investigation is owned by the City of Fosston and is intended only for airport operations. None of the property is open to the public.

Environmental Consequences:
Neither the proposed project nor the no action alternative would have an effect on Section 4(f) resources.

4.6 Farmlands

The Farmland Protection Policy Act (FPPA) regulates Federal actions with the potential to convert farmland to non-agricultural uses. Specifically, the Act regulates farmland identified as prime, unique, or of statewide or local importance. The proposed action is located in the airport operations area (AOA) and is not planned or zoned as farmland. It is also does not meet any of the identified criteria in 7 CFR, part 657.5 for prime farmland, unique farmland, or statewide and locally important farmland.

There is no farmland affected by either the preferred alternative or the no-action alternative.

4.7 Hazardous Materials, Solid Waste, and Pollution Prevention

Regulatory Setting:
Four primary laws have been passed governing the handling and disposal of hazardous materials, chemicals, and wastes. The two statutes of most importance to the FAA in proposing actions to construct and operate facilities and navigational aids are the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA or Superfund) and the Community Environmental Response Facilitation Act of 1992. The RCRA governs the generation, treatment, storage, and disposal of hazardous wastes. CERCLA provides for consultation with natural

resources trustees and cleanup of any release of a hazardous substance (excluding petroleum) into the environment.

Affected Environment:
When describing the study area for hazardous materials, solid waste, and pollution prevention, FAA primarily considers two items. The first item FAA primarily considers is if there are any existing contaminated sites on the project site, or in the immediate vicinity. The second items the FAA primarily considers is to identify the amounts of solid and hazardous wastes and to then identify the local capacity for disposal.

Image: 2000 gallon fuel tank

The existing conditions at the Fosston Municipal Airport includes a 2000 gallon fuel tank. It is a self-service fuel station located south of the aircraft apron. The tank is closely monitored and maintained by City staff to prevent possible leaks and contamination to stormwater and groundwater. This is the only large storage tank located on the facility. Other potential materials identified include lubricants, hydraulic and windshield washer fluids, battery acid, transmission fluid and motor oil. However, all these materials are contained inside buildings and are not exposed to stormwater. Therefore, they are not identified as a potential source of contamination.

The proposed project does not include additional storage tanks. The proposed hangar may contain small amounts of hazardous material, but it would be contained inside buildings. Contaminated soils are not a concern on the Proposed Project. However, if contamination is encountered, it will be reported immediately to the state duty officer at 651 649 5451 or 800 422 0798.

During construction, the site will likely become disturbed and susceptible to erosion. However, a National Pollutant Discharge Elimination System (NPDES) permit will be required which will address potential pollution during construction. Perimeter control such as silt fence will be installed prior to any soil disturbance when necessary and all disturbed areas will be stabilized according to the current NPDES Construction Stormwater (CSW) Permit requirements and timeline provisions. Because Ouff Lake is listed as impaired due to nutrients and has an approved total maximum daily load (TMDL), construction will also need to comply with CSW Permit part 23.1 - *Additional Requirements for Discharges to Special*

(Prohibited, Restricted, Other) and Impaired Waters. The Permit states that Permittees must immediately initiate stabilization of exposed soil areas, as described in item 8.4, and complete the stabilization within seven (7) calendar days after the construction activity in that portion of the Site temporarily or permanently ceases.

Environmental Consequences:
The proposed action and No action alternative are not anticipated to generate an appreciably different quantity or type of solid waste and hazardous materials and would not adversely affect human health or the environment.

4.8 Historical, Architectural, and Archaeological and Cultural Resources

Regulatory Setting:
Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, requires consideration of the effects of federal undertakings on properties listed or eligible for inclusion in the National Register of Historic Places (NRHP). Compliance with Section 106 requires the lead federal agency to conduct "agency-to-agency consultation" with the State Historic Preservation Officer (SHPO) and also with Native American Tribal Historic Preservation Officers (THPOs) to determine if there is a potential to adversely affect properties with historic or cultural significance.

Affected Environment:
In order to determine if a project will have a potential effect on a historic property, an Area of Potential Effect (APE) must be determined. Although technically defined as one APE inclusive of all potential historic resource types, areas of investigation within that APE will vary by resource type. As the lead Federal Agency, the FAA identified the APE. The APE for this project encompasses all areas proposed for disturbance and the view shed (the area which the project may visually impact) of the project.

Coordination:
Section 106 determination letters were sent out to Red Lake Nation, White Earth Nation THPO, Turtle Mountain THPO, and the MN SHPO for review and concurrence of no historic properties affected. In response to the letters, SHPO requested a building inventory was conducted (Appendix C; Figure 9) and provided to SHPO for evaluation. After the completion of the building inventory, SHPO provided written concurrence (February 19th, 2020) with the finding. White Earth THPO provided written concurrence via email (January 26th, 2020). None of the remaining THPOs provided their written concurrence within 30 days. Because THPO's did not provide a written response and it was assumed that no response was considered concurrence. SHPO and THPO documentations, along with the building inventory, are included in Appendix C.

Environmental Consequences:
Coordination with SHPO and individual THPO's did not identify any impacts to any National Register listed or eligible-for-listing resources due to the proposed project. The site is located in an area that is not likely to have cultural significance. The site has already been significantly disturbed due to adjacent airport development and/or farming practices. The entire APE has been subject to various earthmoving activities over the years. If any construction activity results in the advertent discovery of a cultural resource, construction will halt until the SHPO, THPOs, and the FAA are notified.

No impacts to cultural and/or historic resources are expected with the proposed action or no action alternative.

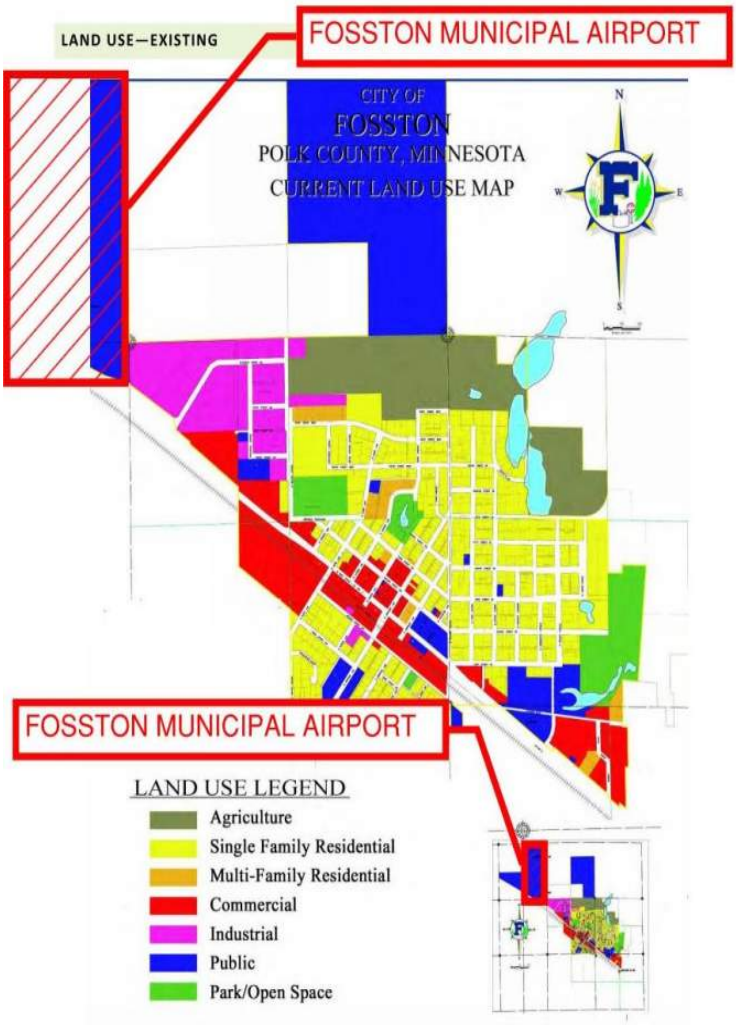
4.9 Land Use

Regulatory Setting:
The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts as described in Section 5.11, Noise and Noise-Compatible Land Use. In addition to the impacts of noise on land use compatibility, other potential impacts of FAA actions may also affect land use compatibility (e.g., disruption of communities, relocation, induced socioeconomic impacts, land uses protected under Section 4(f) of the DOT Act).

For airport actions, the Land Use section of the environmental document shall include documentation to support the required airport sponsor's assurance under 49 U.S.C. subsection 47107 (a)(10), formerly Section 511(a)(5) of the 1982 Airport Act, that appropriate action, including the adoption of zoning laws, has been or will be taken, to the extent reasonable, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations, including landing and takeoff of aircraft. The assurance must be related to existing and planned land uses.

Affected Environment:
Exhibit 5-1 shows the existing land use map for the City of Fosston. As illustrated, the entire subject property is zoned as "Public". The Public land comprises approximately 698 acres in Fosston, and it includes land used for city, county, or state uses and schools, non-profits, and public utilities. With 308 acres, the airport accounts for most of the land in this zoning district (3). Adjacent land consists of the Fosston Golf Course (west), industrial park (southeast), and farmland (remaining area). See Figure 6; Parcel Map. The planned future use will not change significantly, but the Industrial zone is expected to expand to the north. The surrounding properties are compatible with the airport operations. The proposed action will remain within the airport property and will not significantly increase the number of operations at the airport.

Exhibit 5-1 Existing Land Use Map



Environmental Consequences:
The uses proposed are consistent with zoning regulations and are also not expected to conflict with any existing or future adjacent land uses. In addition, the proposed project is not expected to result in any disruption of surrounding communities; will not affect aircraft approaches and departures; and will not increase the potential for attracting hazardous wildlife. The proposed project is consistent with the Fosston's Comprehensive Plan and land use map. For these reasons, there are no land use impacts expected with either the preferred alternative or no-action alternative.

4.10 Natural Resources and Energy Supply

Regulatory Setting:
As an impact category, natural resources and energy supply provides an evaluation of a project consumption of natural resources and use of energy supplies. Consumption of natural resources and use of energy supplies may result from construction, operation, and/or maintenance of the proposed action. It is the policy of the FAA, consistent with NEPA and the CEQ regulations, to encourage the development of facilities that exemplify the highest standards of design including principles of sustainability.

Affected Environment:
If there are major changes in natural resource or energy supply requirements, it is recommended that consultation be initiated with State, tribal, and local agencies. It is also recommended to consult with local utility companies to gain an understanding of the available and planned electrical, natural gas, water, and sewage capabilities of the area.

Because the proposed action is not anticipated to result in major changes to Natural Resources and Energy Supply, consultation was not conducted with the local utility companies. However, state, tribal and local agencies were contacted and no comments were received indicating concerns of Natural Resources and Energy Supply.

The proposed action includes a new hangar which would use only minimal amounts of electricity for light and power. They are also expected to use minor amounts of natural gas for heat during the cool season. There is no shortage of construction materials required for the proposed project. Typical hangars are constructed primarily with wood and steel materials. Aprons are typically constructed using concrete or bituminous. All materials anticipated for the proposed action are readily available within the local community.

Environmental Consequences:
Because of the items discussed above, it is our understanding the Proposed Project and No Action Alternative would not have an adverse effect on local supplies of energy or natural resources.

4.11 Noise and Noise-Compatible Land Use

Regulatory Setting:
Noise is considered unwanted sound that can disturb routine activities (e.g., sleep, conversation, student learning) and can cause annoyance. Aviation noise primarily results from the operation of fixed and rotary wing aircraft, such as departures, arrivals, overflights, taxiing, and engine run-ups. Noise is often a predominant aviation environmental concern of the public.

For aviation noise analysis, the FAA has determined that the cumulative exposure of individuals to noise resulting from aviation activities must be established in terms of yearly day/night average sound level (DNL) as FAA's primary metric. The DNL accounts for the noise levels of all individual aircraft events, the number of times those occur, and the period of day/night in which they occur.

Affected Environment:
FAA 1050.1F Desk Reference (July 2015), Section 11.1.2 indicates a noise analysis is not required because DNL 65 dB contour areas will not extend more than 10,000 feet from start of takeoff roll.

Special consideration needs to be given to the significance of noise impacts on noise sensitive areas within national parks, national wildlife refuges and historic sites, including traditional cultural properties (TCPs). Fosston Municipal Airport is not located on, or near any national parks, TCPs or wildlife refuges.

Furthermore, adjacent land use has been determined to be compatible with the proposed action (See Land Use Section). Therefore, special consideration does not apply to the proposed project location.

Residents, schools, daycares, hospitals, nursing homes and other nearby sensitive receptors were also considered. However, considering the distance each of these facilities is located from the airport along with the minimal amount of noise the small aircraft associated with this airport, these facilities will not see a noticeable increase in noise.

Environmental Consequences:
For the reasons listed above, the proposed action and no action alternative will not result in significant impacts to Noise and Noise-Compatible Land Use.

4.12 Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks

Socioeconomic Impacts

Regulatory Setting:
If acquisition of real property or displacement of persons is involved, 49 CFR part 24, as amended must be met for Federal projects involving Federal funding. Otherwise, the FAA, to the fullest extent possible, observes all local and State laws, regulations, and ordinances concerning zoning, transportation, economic development, housing, etc. when assessing the proposed action or alternatives.

Affected Environment:
When considering socioeconomic impacts, it is important to consult with local transportation, housing and economic development officials. The FAA 1050.1F Desk Reference recommends that "The principal social impacts to be considered are those associated with relocation or other community disruption, transportation, planned development and employment."

Haul routes should typically be located away from places where children live, learn, and play. US Highway 2 will be used as a haul route for the proposed project and is directly adjacent to the high school and near the elementary school, playgrounds, and parks. However, the highway is a major arterial road associated with trucks and other existing highway traffic. Any haul trucks required for this project would not result in a noticeable impact to existing conditions. In addition, large quantities of material are not required for the proposed project. The proposed project is only anticipated to require minimal haul trucks for tasks such as moving equipment and some base material under proposed bituminous.

There are no concerns of the proposed action resulting in socioeconomic impacts. The proposed action will not disrupt any planned communities, transportation, or employment.

Environmental Consequences:
The proposed project and no action alternative would not result in such impacts.

Environmental Justice

Regulatory Setting:
Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, or national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies.

Executive Order 12898 encourages the consideration of environmental justice impacts, especially to determine whether a disproportionately high and adverse impact may occur. When the FAA determines that a project has significant impacts in any environmental impact category, the potential for disproportionately high and adverse effects on minority or low-income populations must be examined pursuant to DOT Order 5610.2(a). Even in the absence of a finding of significant impact in another environmental impact category, further inquiry into the potential for disproportionately high and adverse effects on minority or low-income populations may be warranted based upon the demographics of the study area and the nature of the environmental impacts associated with the proposed project.

Under Title VI, the FAA is also required to ensure that no person, on the ground of race, color, or national origin, is excluded from participation in, denied the benefits of, or subjected to discrimination under any program or activity receiving Federal financial assistance.

Affected Environment:
Environmental Justice was examined during evaluation of other impact categories, especially noise, air quality, water, hazardous materials, and cultural resources. A review of the demographics of the City of Fosston revealed that approximately 7% of the population is minority and 17% of the population (over the age of 18) earns an annual income under the poverty limits (United States Census Bureau).

All of the environmental impact categories were reviewed and evaluated to determine whether there would be any disproportionate impacts to minority and low-income populations. There are no low income or minority populations on the property, or adjacent properties that would be affected by the proposed action. The proposed action will occur entirely on airport property which will not impact any minority or low-income populations. Noise levels will not be an issue. Furthermore, as identified in the land use section of this report, the adjacent land uses are compatible with the proposed action which further indicates that there will be no impact to minority or low-income populations.

Environmental Consequences:
The preferred alternative and no action alternative would have no Environmental Justice impacts.

<u>Children's Environmental Health and Safety Risks</u>

Regulatory Setting:
Pursuant to Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks 62 Federal Register 19885, (April 21, 1997), Federal agencies are directed, as appropriate and consistent with the agency's mission, to make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children.

Affected Environment:
The affected environment for potential impacts for children's environmental health and safety is related to the affected environment for other impact categories. During investigations, no potential impacts were identified.

All of the environmental impact categories were reviewed and evaluated to determine whether there would be any disproportionate impacts to Children's Environmental Health and Safety. Environmental health risks and safety risks include risks to heath or to 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 in which they might use or be exposed. The proposed action is not anticipated to impact any such items.

Environmental Consequences:

Both the preferred alternative and no action alternative would not introduce any hazardous materials which would be likely to come in contact with children and would not result in such impacts.

4.13 Visual Effects

Regulatory Setting:
Some visual resources are protected under Federal, state, or local regulations. Protected visual resources generally include, but are not limited to, Federal, state, or local scenic roadways/byways; Wild and Scenic Rivers; National Scenic Areas; scenic easements; trails protected under the National Trails System Act or similar state or local regulations; biological resources; and features protected under other Federal, state or local regulations.

Affected Environment:

Light Emissions
Before considering the impacts of the proposed action, it is important to first establish a baseline, or existing conditions. The proposed action is located on existing airport property and adjacent to existing airport operations. Lighting along Runway 16-34 consists of Runway End Identifier Lights (REIL) at each end, and also Medium Intensity Runway Lighting (MIRL) along each shoulder. As a result, there are several light emissions currently impacting the area and surrounding properties.

The proposed action will not result in additional light emissions. Construction is not anticipated to occur at night and there should be no additional light emissions from construction. There is no additional lighting proposed for the proposed project.

Visual Resources and Visual Character
The property is currently developed and operating as an airport. The proposed hangar will be constructed immediately adjacent to the north of existing hangars. It will also match the visual character of the existing operations. As discussed previously, there are no documented historic or cultural sites close to the proposed action. Therefore, there are no anticipated impacts to visual resources and visual character.

Environmental Consequences:
The development and completion of the proposed action will not increase light emissions and the proposed hangar will match the visual character of the existing area.

For these reasons, neither the preferred alternative nor the no-action alternative are expected to have significant light emissions and visual impacts.

4.14 Water Resources

Wetlands
Regulatory Setting:
A water of the United States is considered a jurisdictional surface water or wetland under the Clean Water Act (CWA); the regulatory definition is found at 33 CFR section 328.3(a), and further guidance if found in the EPA/USACE Memorandum "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabel v. United States*." Any surface water not meeting this definition is considered non-jurisdictional, and therefore has no statutory protection under the CWA. It is important to note that not all surface waters are considered jurisdictional under the CWA. This determination is made on a case-by-case basis by the USACE; as a result, the Airport should consult with the USACE to determine the jurisdictional status of any surface water that may be affected by a proposed action or alternative. Non-jurisdictional wetlands are protected under Executive Order 11990.

Affected Environment:
The wetland study area should be defined as the area with the potential to be either directly or indirectly affected by the proposed project. For example, construction of a new facility can directly impact wetlands through the direct loss of wetland area and function within the construction footprint of an alternative. Construction of a facility upstream from a wetland along a stream could also indirectly affect the wetland by changing the quantity of quality of water that flows downstream to the wetland area.

Wetlands on the site are part of a larger network of wetlands draining agricultural land. The network of wetlands runs to the NW into Ouff Lake. See Appendix B; Figure 5 – Wetland Delineation and Appendix D; Wetland Delineation Report.

Wetlands surrounding Ouff Lake and along the north end of the Runway are also Public Water wetlands. As a result, any work in these wetlands will require a public waters work permit.

Environmental Consequences:
The proposed project will affect 3 wetlands totaling 2.59 acres of wetland impact. A wetland delineation was conducted the fall of 2018 and has received boundary concurrence from both the East Polk Soil and Water Conservation District, and also the US Army Corps of Engineers. Appendix B includes a wetland delineation map. The wetlands are located in the Red River of the North-Sand Hill River Watershed, Bank Service Area #3. Any impacts to jurisdictional wetlands will require mitigation at a replacement ratio of 2:1. Compensation of wetland impacts will be achieved by using BSA #3 wetland credits within the State managed wetland banking program. The nearest wetland bank with available credits is located southeast of Crookston, MN and approximately 25 miles northwest of Fosston. According to the BWSR wetland banking tool, the bank has 6.25 credits (acres) available for purchase as of January 30th, 2020.

The proposed wildlife perimeter fence will also be installed in the public water wetlands located to the north of the Runway. In order to avoid any wetland impact, the proposed fence will not include underground skirting in the wetlands. However, a public water work permit will still need to be acquired by the MN DNR.

<u>Floodplains</u>
Regulatory Setting:
To comply with Executive Order 11988, Floodplain Management, 42 Federal Register 26951, (May 25, 1977) and DOT Order 5650.2, Floodplain Management and Protection, all FAA actions must avoid floodplains if a practicable alternative exists.

Affected Environment:
The study area for floodplains should be defined as the entire geographic area with the potential to be either directly or indirectly affected by the proposed project, and not merely the area immediately adjacent to the action.

Environmental Consequences:
Fosston Municipal Airport is not within a floodplain. Figure 7 in Appendix B shows the floodplain map for the City of Fosston. After analysis, there is no evidence of impacts to floodplains from either the preferred alternative or no-action alternative.

<u>Surface Waters</u>
Regulatory Setting:
Early coordination among FAA, USFWS, EPA, MPCA, and the USACE may assist the FAA in addressing surface water issues or conflicts early in the NEPA process and in developing ways to resolve

them. If an alternative would impact a surface water that is determined to be jurisdictional by the USACE under WCA and/or the River and Harbor Act, or if impacts are determined to a "Water of the State" (see following paragraph), the following permits may be required: Section 404 Permit and 401 Certification, Section 402 NPDES Permit, Section 10 Permit.

The MPCA Clean Water Act Section 401 Water Quality Certification is a regulating entity that may require protection (and mitigation) to surface waters through best management practices (BMPs) during construction. The MPCA uses the definition of "Waters of the State" as defined in Minn. Stat. ch. 115.01 subd 22. to determine what waters are regulated by the MPCA. This definition is broader than the definition of "Waters of the U.S." used by the U.S. Army Corps of Engineers (USACE). Some waters that are not regulated by the USACE or under the Wetland Conservation Act (WCA), are regulated by the MPCA. When making an application for wetlands impacts for a proposed project, the applicant needs to include all impacts to all surface waters, even if those waters have been determined to be non-jurisdictional by the USACE or are WCA exempt.

Affected Environment:
The surface water study area should be defined as the entire geographic area with the potential to be either directly or indirectly impacted by the proposed project, and not merely the area immediately adjacent to the action.

Stormwater runoff on the site is captured by drainage ditches and conveyed north to a wetland complex, which then drains to the northwest into Ouff Lake. Additional impervious surfaces developed by the proposed project would be handled in the same fashion. The Proposed Project includes the addition of 71,372 square feet of impervious surface. However, the proposed project also includes the removal of 31,946 square feet of impervious. The net result is an additional 39,426 square feet (0.90 acres) of new impervious. Because the total project will not result in greater than 1 acre of new impervious, a permanent stormwater treatment system is not required.

Potential pollutant sources at the airport were previously discussed in 5.7 Hazardous Materials. There are no additional pollutant sources associated with the proposed project. The proposed project would also require the issuance of a NPDES construction permit from the MPCA. Ouff Lake is listed on the Minnesota 2018 Impaired Waters List as impaired for Aquatic Recreation use due to excessive nutrient and eutrophication biological indicators. As a result, additional best management practices (BMP's) will be implemented during construction (See Regulator Setting above).

Environmental Consequences:
The increased stormwater runoff as a result of the new impervious surface is a potential additional pollutant source associated with the Project and will be mitigated through the requirements of the NPDES Construction Stormwater Permit. After analysis, there is no evidence of impacts to surface waters from either the preferred alternative or no-action alternative.

<u>Ground Water</u>
Regulatory Setting:
Federal activities affecting groundwater are primarily governed by the Safe Drinking Water Act (SDWA). The SDWA may not be applicable to every proposed project, and should only be included when relevant. Early coordination with EPA may assist the FAA in addressing groundwater issues or conflicts early in the NEPA process and in developing ways to resolve them.

Affected Environment:
There is one well located on the airport servicing the pilot lounge, located west of the building. Wells supplying city water are located along the south edge of the City near County Road 6. The proposed

project is not located within the Drinking Water Supply Management Area (DWSMA). Figure 8 in Appendix B shows the wellhead protection areas for Fosston.

The groundwater study area is defined as the entire geographic area with the potential to be both directly or indirectly impacted by the proposed project, and not merely adjacent to the action. Items which could potentially impact groundwater are additional wells, septic systems, or additional stormwater. The proposed hangars are not anticipated to include individual wells, or septic systems which could potentially impact the groundwater infiltration or recharge. However, the additional hangar apron will slightly increase the amount of impervious surfaces impacting the amount of stormwater. The increased amount of stormwater will be treated entirely on-site and will not create any additional stormwater near well heads.

Environmental Consequences:
The proposed project would not affect the existing conditions regarding groundwater, water supply or drinking water sources. In summary, both the preferred alternative and no-action alternative would not have the potential to exceed water quality standards.

Wild and Scenic Rivers
Regulatory Setting:
The Wild and Scenic Rivers Act, as amended, describes those river segments designated or eligible to be included in the Wild and Scenic Rivers System.

Affected Environment:
The closest river segment is the Wild Rice River located about 12 miles to the southeast.

Environmental Consequences:
No Wild and Scenic River or NRI river segment is in the affected environment. Therefore neither the preferred alternative nor the no-action alternative would have impacts to Wild and Scenic Rivers.

5.0 CUMULATIVE EFFECTS

The Council on Environmental Quality (CEQ) Regulations define a cumulative impact as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (see 40 CFR ss 1508.7). Past, present, and reasonably foreseeable future actions must be considered in determining whether there are potential cumulative impacts.

Past actions at the study area include farming and airport operations. The airport was established during the World War II era and was taken over by the City of Fosston in 1946. Prior to airport operations, the land was likely farmed. There are no known previous or current uses of the land other than farming and airport, which is not likely to result in any cumulative impacts. Therefore, for the purposes of this section, “reasonably foreseeable” future actions are primarily considered.

The Airport Layout Plan is shown In Appendix B, Figure 9. It shows the reasonably foreseeable future actions. The layout plan includes potentially developing additional hangar aprons to the north, extending Runway 16, and developing a crosswind Runway. The additional hangars and crosswind Runway would result in cumulative stormwater runoff. However, stormwater will still be contained entirely on-site. Extension of Runway 16 would impact wetlands. However, wetland impacts would be minimized as much as possible and mitigated appropriately.

Biological resources were considered for cumulative impacts. Future development will not require tree removal. Most of the area is currently farmland, which is not expected to inhabit threatened or endangered species. Therefore, no cumulative impacts to threatened and endangered species are anticipated.

Historical, Architectural, Archaeological & Cultural Resources were also considered for cumulative impacts. Consultation would be conducted with SHPO and THPOs for any potential impacts to resources for future projects. The majority of the additional development is located in existing farmland which is annually disturbed for crops. Therefore it is unlikely the future work would result in cumulative impacts to Historical, Architectural, Archaeological or Cultural Resources.

Stormwater was considered for cumulative impacts. Any cumulative stormwater generated from the site needs to run through approximately 3000 linear feet of vegetative swale (ditch). Since vegetative swales are an effective type of BMP, the likelihood of stormwater from the site having a negative impact on Ouff lake is very unlikely.

During analysis of the environmental categories, cumulative impacts were considered. There is no resource which may be especially vulnerable to incremental impacts, no other activities in the foreseeable future are anticipated to have similar impacts to resources. There are no known projects in proximity to the airport that could have a cumulative effect with any of the environmental consequences of the Proposed Project.

6.0 PUBLIC AGENCY COORDINATION

Coordination has occurred with several local, state and Federal agencies. Meetings and coordination were conducted with Polk County SWCD, BWSR, and Corps of Engineers to determine appropriate avenues for wetland removal. The wetland delineation report, and associated documentation are located in Appendix A.

In addition to the agency coordination, consultation was conducted directly with SHPO and multiple THPOs. FAA determined the project would result in a finding of *No Historic Properties Affected*. The finding was submitted to Minnesota SHPO, White Earth Nation THPO, Red Lake Nation THPO, and Turtle Mountain THPO, requesting concurrence. Since comments were not received within 30 days, it is assumed that each THPO concurs with the finding. See Appendix A for SHPO and THPO coordination documents.

A Natural Heritage Information System (NHIS) Data Request was submitted to the MN DNR requesting the proposed project be reviewed for potential effects to rare features. A response was received December 13th, 2019 indicating the proposed project will not likely adversely affect any known occurrences of rare features. The NHIS response letter is attached in Appendix A.

A Draft Environmental Assessment will be available for review and/or distribution for a 30 day review and comment period. A public notice will also be placed in the Thirteen Towns Newspaper (local newspaper) identifying the proposed project and the availability of the Draft EA at Fosston City Hall. A notice of opportunity for the public to request a public hearing will also be identified in the public notice. Comments will be invited and collected during the 30 day period. All comments will be documented in Appendix A of the Final EA with appropriate responses.

7.0 LIST OF PREPARERS

Preparer	Title/Firm	EA Responsibility
Keith Kinnen, PLA	Environmental Specialist/ Karvakko, P.A.	EA Principal Author
Michael Karvakko, PE	Principal/ Karvakko, P.A.	Aviation Planning, Quality Assurance

8.0 LIST OF AGENCIES AND PERSONS CONSULTED

As discussed in Section 7.0, several agencies were contacted early in the process and invited to comment on the proposed project while the Draft EA was developed. The Draft EA was then sent out only to agencies potentially effected for review and comment. Table 7 identifies agencies contacted during the EA process.

Table 7: Agencies Contacted			
Agency	**Preliminary Invitation coordination**	**Draft Environmental Assessment**	**Anticipated Permits**
Federal Agencies			
US Army Corps of Engineers	X		404 Permit for wetland impacts
US Environmental Protection Agency			
USDA APHIS Wildlife Services			
US Fish and Wildlife Service	X		
Federal Aviation Administration			
State Agencies			
Minnesota Department of Agriculture			
Minnesota Department of Commerce			
Minnesota Environmental Quality Board			
Minnesota Department of Health			
Minnesota Department of Natural Resources	X		
Minnesota Pollution Control Agency			401 Permit for water quality certification, NPDES Permit for site disturbance
Minnesota Department of Transportation			

Minnesota Board of Water and Soil Resources	X		Joint Application for wetland impacts
Mn/DOT Office of Aeronautics			
SHPO/THPO's			
Minnesota SHPO	X		
White Earth Nation THPO	X		
Red Lake Nation THPO	X		
Turtle Mountain Band of Chippewa THPO	X		
Local Agencies			
City of Fosston	X		
Polk County Environmental Services			

9.0 REFERENCES

1. Triggering Event Narrative Report
2. 2017, USDA WHSV
3. 2018 Fosston Comp Plan
4. US Department of Transportation, FAA Order 1050.1F, July 2015
5. FAA 1050.1F Desk Reference, July 2015
6. Executive Office of the President, Council on Environmental Quality, Memorandum for Heads of Federal Departments and Agencies, *Final Guidance for Federal Departments on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews*, August 2016
7. Minnesota Department of Natural Resources, Rare Species Guide, (website)
8. US Fish & Wildlife Service, Endangered Species List, (website)
9. USDA Web Soil Survey, (website)
10. Minnesota Department of Natural Resources, Recreation Compass, (website)
11. USGS Groundwater Information Pages, (website)
12. Minnesota Pollution Control Agency, Impaired Waters Viewer (IWAV), (website)
13. US Fish & Wildlife Service, National Wetlands Inventory
14. United States Census Bureau – American FactFinder
15. Google Images – Various images were used in this document to provide visual aids in determining the environmental impacts of the proposed project. Images were not used for profit and only the minimal amount of material necessary to assess impacts. No copyright infringement is intended.
16. FAA National Part 139 Cert Alert (08/03/2016)

10.0 APPENDICES

Appendix A: Consultation and Comments

- Wetland Consultation
  - Notice of Decision from TEP
  - Concurrence Letter from COE
- DNR Consultation (NHIS)
- SHPO/THPO – See Appendix C
- Comments on Draft EA
  - EPA Comments
  - Reponses to EPA
  - MPCA Comments and Responses
  - DNR Comments
  - Responses to DNR
  - USDA Letter

Appendix B: Figures

- Figure 1: General Location
- Figure 2: Existing Conditions
- Figure 3: Proposed Site Plan
- Figure 3.1: Proposed Fence Plan
- Figure 4: Wildlife Corridors (Aerial Photo)
- Figure 5: Wetland Delineation
- Figure 6: County Parcel Map
- Figure 7: Floodplain Map
- Figure 8: Wellhead Protection
- Figure 9: Airport Layout Plan
- Figure 10: National Wetland Inventory (NWI) Map

Appendix C: Cultural Resources

- APE and Section 106 Finding
- Coordination with SHPO/THPO's
- SHPO concurrence with 106 Finding

Appendix D: Other Miscellaneous Items

- 2018 Triggering Event Narrative Report (TENR)
- 2017 Wildlife Hazard Site Visit (WHSV)
- 2018 Wetland Delineation Report

Appendix A: Consultation and Comments

Project Name and/or Number:

PART ONE: Applicant Information

If applicant is an entity (company, government entity, partnership, etc.), an authorized contact person must be identified. If the applicant is using an agent (consultant, lawyer, or other third party) and has authorized them to act on their behalf, the agent's contact information must also be provided.

Applicant/Landowner Name: City of Fosston
Mailing Address: 220 East First Street
Fosston, MN 56542
Phone: 218-435-1959
E-mail Address:

Authorized Contact (do not complete if same as above): Chuck Lucken, City Administrator
City of Fosston
Mailing Address:
Phone:
E-mail Address: Chuck.lucken@fosston.com

Agent Name: Keith Kinnen, Karvakko P.A.
Mailing Address: 2300 Bemidji Ave North
Suite 101
Bemidji, MN 56601
Phone: 218-444-8004
E-mail Address: Keith.kinnen@karvakko.com

PART TWO: Site Location Information

County: Polk **City/Township: Fosston**
Parcel ID and/or Address:
Legal Description (Section, Township, Range): S32 T148 R40
Lat/Long (decimal degrees):
Attach a map showing the location of the site in relation to local streets, roads, highways.
Approximate size of site (acres) or if a linear project, length (feet): See attached Wetland Delineation Report

If you know that your proposal will require an individual Permit from the U.S. Army Corps of Engineers, you must provide the names and addresses of all property owners adjacent to the project site. This information may be provided by attaching a list to your application or by using block 25 of the Application for Department of the Army permit which can be obtained at:

http://www.mvp.usace.army.mil/Portals/57/docs/regulatory/RegulatoryDocs/engform_4345_2012oct.pdf

PART THREE: General Project/Site Information

If this application is related to a delineation approval, exemption determination, jurisdictional determination, or other correspondence submitted ***prior to*** this application then describe that here and provide the Corps of Engineers project number.

Describe the project that is being proposed, the project purpose and need, and schedule for implementation and completion. The project description must fully describe the nature and scope of the proposed activity including a description of all project elements that effect aquatic resources (wetland, lake, tributary, etc.) and must also include plans and cross section or profile drawings showing the location, character, and dimensions of all proposed activities and aquatic resource impacts.

Project Name and/or Number:

PART FOUR: Aquatic Resource Impact[1] Summary

If your proposed project involves a direct or indirect impact to an aquatic resource (wetland, lake, tributary, etc.) identify each impact in the table below. Include all anticipated impacts, including those expected to be temporary. Attach an overhead view map, aerial photo, and/or drawing showing all of the aquatic resources in the project area and the location(s) of the proposed impacts. Label each aquatic resource on the map with a reference number or letter and identify the impacts in the following table.

Aquatic Resource ID (as noted on overhead view)	**Aquatic Resource Type** (wetland, lake, tributary etc.)	**Type of Impact** (fill, excavate, drain, or remove vegetation)	**Duration of Impact** Permanent (P) or Temporary (T)[1]	**Size of Impact**[2]	**Overall Size of Aquatic Resource** [3]	**Existing Plant Community Type(s)** in Impact Area[4]	**County, Major Watershed #, and Bank Service Area #** of Impact Area[5]

[1]If impacts are temporary; enter the duration of the impacts in days next to the "T". For example, a project with a temporary access fill that would be removed after 220 days would be entered "T (220)".
[2]Impacts less than 0.01 acre should be reported in square feet. Impacts 0.01 acre or greater should be reported as acres and rounded to the nearest 0.01 acre. Tributary impacts must be reported in linear feet of impact and an area of impact by indicating first the linear feet of impact along the flowline of the stream followed by the area impact in parentheses). For example, a project that impacts 50 feet of a stream that is 6 feet wide would be reported as 50 ft (300 square feet).
[3]This is generally only applicable if you are applying for a de minimis exemption under MN Rules 8420.0420 Subp. 8, otherwise enter "N/A".
[4]Use *Wetland Plants and Plant Community Types of Minnesota and Wisconsin* 3rd Ed. as modified in MN Rules 8420.0405 Subp. 2.
[5]Refer to Major Watershed and Bank Service Area maps in MN Rules 8420.0522 Subp. 7.

If any of the above identified impacts have already occurred, identify which impacts they are and the circumstances associated with each:

PART FIVE: Applicant Signature

☐ Check here if you are requesting a pre-application consultation with the Corps and LGU based on the information you have provided. Regulatory entities will not initiate a formal application review if this box is checked.

By signature below, I attest that the information in this application is complete and accurate. I further attest that I possess the authority to undertake the work described herein.

Signature: Chuck Fischer Date: 11-7-2018

I hereby authorize **Keith Kinnen** to act on my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this application.

[1] The term "impact" as used in this joint application form is a generic term used for disclosure purposes to identify activities that may require approval from one or more regulatory agencies. For purposes of this form it is not meant to indicate whether or not those activities may require mitigation/replacement.

Project Name and/or Number:

Attachment A
Request for Delineation Review, Wetland Type Determination, or Jurisdictional Determination

By submission of the enclosed wetland delineation report, I am requesting that the U.S. Army Corps of Engineers, St. Paul District (Corps) and/or the Wetland Conservation Act Local Government Unit (LGU) provide me with the following (check all that apply):

☐ **Wetland Type Confirmation**

☒ **Delineation Concurrence.** Concurrence with a delineation is a written notification from the Corps and a decision from the LGU concurring, not concurring, or commenting on the boundaries of the aquatic resources delineated on the property. Delineation concurrences are generally valid for five years unless site conditions change. Under this request alone, the Corps will not address the jurisdictional status of the aquatic resources on the property, only the boundaries of the resources within the review area (including wetlands, tributaries, lakes, etc.).

☐ **Preliminary Jurisdictional Determination.** A preliminary jurisdictional determination (PJD) is a non-binding written indication from the Corps that waters, including wetlands, identified on a parcel may be waters of the United States. For purposes of computation of impacts and compensatory mitigation requirements, a permit decision made on the basis of a PJD will treat all waters and wetlands in the review area as if they are jurisdictional waters of the U.S. PJDs are advisory in nature and may not be appealed.

☐ **Approved Jurisdictional Determination.** An approved jurisdictional determination (AJD) is an official Corps determination that jurisdictional waters of the United States are either present or absent on the property. AJDs can generally be relied upon by the affected party for five years. An AJD may be appealed through the Corps administrative appeal process.

In order for the Corps and LGU to process your request, the wetland delineation must be prepared in accordance with the 1987 Corps of Engineers Wetland Delineation Manual, any approved Regional Supplements to the 1987 Manual, and the *Guidelines for Submitting Wetland Delineations in Minnesota* (2013).
http://www.mvp.usace.army.mil/Missions/Regulatory/DelineationJDGuidance.aspx

Project Name and/or Number:

Attachment B
Supporting Information for Applications Involving Exemptions, No Loss Determinations, and Activities Not Requiring Mitigation

Complete this part *if* you maintain that the identified aquatic resource impacts in Part Four do not require wetland replacement/compensatory mitigation OR *if* you are seeking verification that the proposed water resource impacts are either exempt from replacement or are not under CWA/WCA jurisdiction.

Identify the specific exemption or no-loss provision for which you believe your project or site qualifies:

Provide a detailed explanation of how your project or site qualifies for the above. Be specific and provide and refer to attachments and exhibits that support your contention. Applicants should refer to rules (e.g. WCA rules), guidance documents (e.g. BWSR guidance, Corps guidance letters/public notices), and permit conditions (e.g. Corps General Permit conditions) to determine the necessary information to support the application. Applicants are strongly encouraged to contact the WCA LGU and Corps Project Manager prior to submitting an application if they are unsure of what type of information to provide:

FAA and City of Fosston have identified the need to remove the two wetlands east of the runway at the airport because the wetlands are inviting too much wildlife which pose a hazard to aircraft. I would like to first identify the most feasible solution to remove the wetlands. Fill? Drain? Other? Then, I would like to determine the best path toward the selected option. Should we apply for a jurisdictional determination? Looking at the wetlands, I wonder if they are isolated and possibly non-jurisdictional.

I spoke with Rachel and understand the next meeting is Thursday, November 8th. I can attend the meeting if it is beneficial, I would just need to know in advance to get it worked into my schedule.

I look forward to working with you all.

Thank you,
Keith Kinnen

Notice of Decision from TEP

Minnesota Wetland Conservation Act
Notice of Decision

Local Government Unit (LGU)	Address
E. Polk SWCD	**240 Cleveland Ave SW, PO Box 57** **McIntosh, MN 56556**

1. PROJECT INFORMATION

Applicant Name	Project Name	Date of Application	Application Number
Chuck Lucken **Fosston Airport**	**Airport Delineation**	**11-1-18**	**19-1**

☒ Attach site locator map.

Type of Decision:

☒ Wetland Boundary or Type ☐ No-Loss ☐ Exemption ☐ Sequencing

☐ Replacement Plan ☐ Banking Plan

Technical Evaluation Panel Findings and Recommendation (if any):

☒ Approve ☐ Approve with conditions ☐ Deny

Summary (or attach): The Joint Application was received on November 1, 2018. The report was reviewed by the TEP and the consultant received suggested edits and the request to field verify during the growing season. The application was resubmitted July 10, 2019 and due to the changes and the confirmation during the field verification, the TEP can recommend approval of the revised report received on July 10, 2019.

2. LOCAL GOVERNMENT UNIT DECISION

Date of Decision: **7-18-19**

☒ Approved ☐ Approved with conditions (include below) ☐ Denied

LGU Findings and Conclusions (attach additional sheets as necessary):

The Fosston Airport is seeking delineation concurrence for future projects thus a delineation report was completed and submitted to the LGU along with a Joint Application on November 1, 2018. A delineation was done on three wetlands found within the Fosston Airport located along side the runways and one near the hangers. The Fosston Airport is located on the western edge of Fosston, MN. Rachel Klein, E. Polk SWCD, and Steve Hofstad, BWSR Wetland Specialist, reviewed the delineations data sheets and provided the consultant with comments and recommendations on the data sheets on January 12, 2019. The delineation report was determined to require field verification and the application was put on hold until a site visit could take place during the growing season. The site visit took place on July 9, 2019. The final delineation report was received by the E. Polk SWCD on July 10, 2019. It was determined to be complete and accurate by TEP members Rachel Klein, E. Polk SWCD, and Steve Hofstad, BWSR Wetland Specialist. The LGU approves the wetland boundary as defined in the delineation report dated July 10, 2018.

For Replacement Plans using credits from the State Wetland Bank:

Bank Account #	Bank Service Area	County	Credits Approved for Withdrawal (sq. ft. or nearest .01 acre)

Replacement Plan Approval Conditions. In addition to any conditions specified by the LGU, the approval of a Wetland Replacement Plan is conditional upon the following:

☐ **Financial Assurance:** For project-specific replacement that is not in-advance, a financial assurance specified by the LGU must be submitted to the LGU in accordance with MN Rule 8420.0522, Subp. 9 (List amount and type in LGU Findings).

☐ **Deed Recording:** For project-specific replacement, evidence must be provided to the LGU that the BWSR "Declaration of Restrictions and Covenants" and "Consent to Replacement Wetland" forms have been filed with the county recorder's office in which the replacement wetland is located.

☐ **Credit Withdrawal:** For replacement consisting of wetland bank credits, confirmation that BWSR has withdrawn the credits from the state wetland bank as specified in the approved replacement plan.

Wetlands may not be impacted until all applicable conditions have been met!

LGU Authorized Signature:

Signing and mailing of this completed form to the appropriate recipients in accordance with 8420.0255, Subp. 5 provides notice that a decision was made by the LGU under the Wetland Conservation Act as specified above. If additional details on the decision exist, they have been provided to the landowner and are available from the LGU upon request.

Name	Title	
Rachel Klein	**District Manager**	
Signature Rachel Klein	Date 8/21/19	Phone Number and E-mail **klein.eastpolk@gmail.com** **218-563-2777**

THIS DECISION ONLY APPLIES TO THE MINNESOTA WETLAND CONSERVATION ACT. Additional approvals or permits from local, state, and federal agencies may be required. Check with all appropriate authorities before commencing work in or near wetlands.

Applicants proceed at their own risk if work authorized by this decision is started before the time period for appeal (30 days) has expired. If this decision is reversed or revised under appeal, the applicant may be responsible for restoring or replacing all wetland impacts.

This decision is valid for three years from the date of decision unless a longer period is advised by the TEP and specified in this notice of decision.

3. APPEAL OF THIS DECISION

Pursuant to MN Rule 8420.0905, any appeal of this decision can only be commenced by mailing a petition for appeal, including applicable fee, within thirty (30) calendar days of the date of the mailing of this Notice to the following as indicated:

Check one:

☐ Appeal of an LGU staff decision. Send petition and $_____ fee (if applicable) to:	☒ Appeal of LGU governing body decision. Send petition and $500 filing fee to: Executive Director Minnesota Board of Water and Soil Resources 520 Lafayette Road North St. Paul, MN 55155

4. LIST OF ADDRESSEES

☒ SWCD TEP member: **Rachel Klein, 240 Cleveland Ave SW, PO Box 57, McIntosh, MN 56556**
☒ BWSR TEP member: **Steve Hofstad, 1732 North Tower Road, Detroit Lakes, MN 56501**
☐ LGU TEP member (if different than LGU Contact):
☒ DNR TEP member: **Stephanie Klamm, 246 125th Ave NE, Thief River Falls, MN 56701**
☐ DNR Regional Office (if different than DNR TEP member)
☒ WD or WMO (if applicable): **Sandhill River Watershed District**
☐ Applicant and Landowner (if different)
☐ Members of the public who requested notice:

☒ Corps of Engineers Project Manager
☐ BWSR Wetland Bank Coordinator (wetland bank plan decisions only)

5. MAILING INFORMATION

- For a list of BWSR TEP representatives: www.bwsr.state.mn.us/aboutbwsr/workareas/WCA_areas.pdf
- For a list of DNR TEP representatives: www.bwsr.state.mn.us/wetlands/wca/DNR_TEP_contacts.pdf
- Department of Natural Resources Regional Offices:

NW Region:	NE Region:	Central Region:	Southern Region:
Reg. Env. Assess. Ecol. Div. Ecol. Resources 2115 Birchmont Beach Rd. NE Bemidji, MN 56601	Reg. Env. Assess. Ecol. Div. Ecol. Resources 1201 E. Hwy. 2 Grand Rapids, MN 55744	Reg. Env. Assess. Ecol. Div. Ecol. Resources 1200 Warner Road St. Paul, MN 55106	Reg. Env. Assess. Ecol. Div. Ecol. Resources 261 Hwy. 15 South New Ulm, MN 56073

For a map of DNR Administrative Regions, see: http://files.dnr.state.mn.us/aboutdnr/dnr_regions.pdf

- For a list of Corps of Project Managers: www.mvp.usace.army.mil/regulatory/default.asp?pageid=687 or send to:

US Army Corps of Engineers
St. Paul District, ATTN: OP-R
180 Fifth St. East, Suite 700
St. Paul, MN 55101-1678

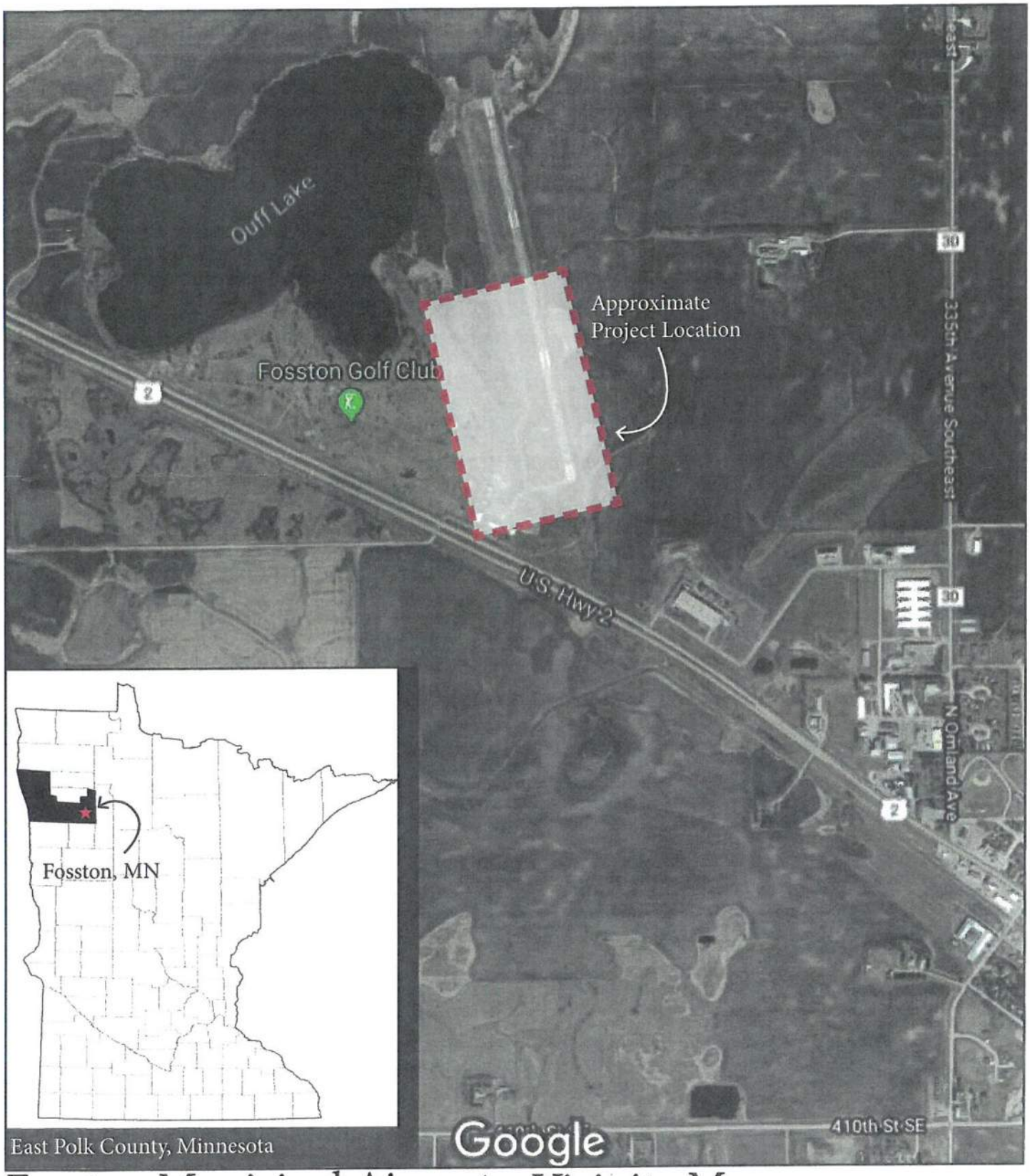
➢For Wetland Bank Plan applications, also send a copy of the application to:

Minnesota Board of Water and Soil Resources
Wetland Bank Coordinator
520 Lafayette Road North
St. Paul, MN 55155

6. ATTACHMENTS

In addition to the site locator map, list any other attachments:

☐
☐
☐
☐
☐



Fosston Municipal Airport - Vicinity Map

Wetland Delineation

Date: July 19th, 2018

KARVAKKO

NO SCALE

NORTH

Concurrence Letter from COE

DEPARTMENT OF THE ARMY
ST. PAUL DISTRICT, CORPS OF ENGINEERS
180 FIFTH STREET EAST, SUITE 700
ST. PAUL, MN 55101-1678

REPLY TO ATTENTION OF
REGULATORY BRANCH

23 SEPTEMBER 2019

Regulatory File No. MVP-2008-05168-LSP

Charles Lucken
City of Fosston
220 East First Street
Fosston, Minnesota 56542

Dear Mr. Lucken:

This letter is in response to correspondence, submitted by Keith Kinnen of Karvakko Engineering on your behalf, requesting Corps of Engineers (Corps) concurrence with the delineation of aquatic resources completed on the approximately 52 acre Fosston Municipal Airport Site in the City of Fosston. The project site is in Section 32, Township 148 North, Range 40 West, Polk County, Minnesota.

We have reviewed the wetland delineation report dated July 10, 2019, and determined that the limits of the aquatic resources have been accurately identified in accordance with current agency guidance including the *Corps of Engineers Wetland Delineation Manual* (1987 Manual) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region. This concurrence is only valid for the review area shown on the enclosed figures labeled MVP-2008-05168-LSP Page 1 of 2 through page 2 of 2. The boundaries shown on the enclosed figures accurately reflect the limits of the aquatic resources in the review area.

This concurrence may generally be relied upon for five years from the date of this letter. However, we reserve the right to review and revise our concurrence in response to changing site conditions, information that was not considered during our initial review, or off-site activities that could indirectly alter the extent of wetlands and other resources on-site. Our concurrence may be renewed at the end of this period provided you submit a written request and our staff are able to verify that the determination is still valid.

No jurisdictional determination was requested or prepared for this project. While not required, you may request a jurisdictional determination from the Corps contact indicated below.

Please note that the discharge of dredged or fill material into waters of the United States without a Department of the Army permit could subject you to an enforcement action. Receipt of a permit from a state or local agency does not obviate the requirement for obtaining a Department of the Army permit.

Regulatory Branch (File No. MVP-2008-05168-LSP)

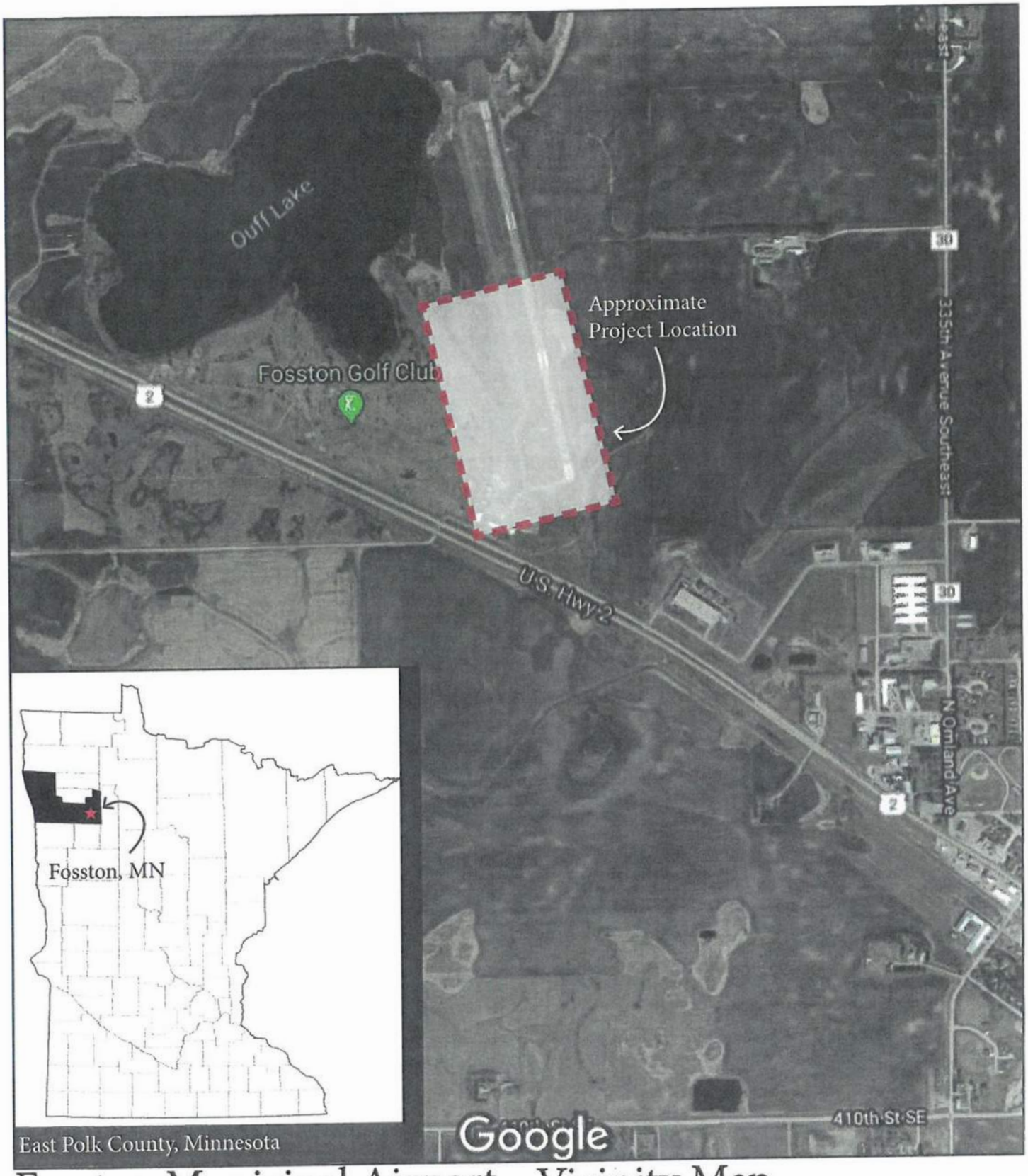
If you have any questions, please contact me in our Bemidji office at (651) 290-5339 or Lawrence.s.puchalski@usace.army.mil. In any correspondence or inquiries, please refer to the Regulatory file number shown above.

Sincerely,

Lawrence S. Puchalski
Project Manager, Northwest Section

Enclosures

cc:
Keith Kinnen, Karvakko (Agent)
Rachel Klein, East Polk SWCD



Fosston Municipal Airport - Vicinity Map

Wetland Delineation

Date: July 19th, 2018

KARVAKKO

NO SCALE

NORTH

2008-05168-LSP
Page 2 of 2

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a Certified Wetland Delineator under the laws of the State of Minnesota.

DRAFT

Lic. No. 1244

Name: Kevin E. Kinnen Date: 10/24/18

KARVAKKO

2300 BEMIDJI AVE N, SUITE 101, BEMIDJI, MN 56601
PHONE: (218) 444-9004 FAX: (218) 444-8562

NO.	REVISIONS	BY	APR.	DATE

DESIGNED KEK	CHECKED KEK
DRAWN ERF	APPROVED KEK
DATE 07/18/18	JOB NO. 18-007

WETLAND OVERVIEW MAP
FOSSTON MUNICIPAL AIRPORT
POLK COUNTY, MINNESOTA

NO STAPLES PLEASE

2012	For Agency	NHIS Data Request	Contact Rqsted? _____
	Received _		Survey Rqsted? _____
	Search Radius _____mi. L / I / D EM Map'd _____		#Com _____
	NoR / NoF / NoE / Std / Sub Let _____ Log out _____		Related ERDB# _____

Minnesota DEPARTMENT OF NATURAL RESOURCES

NATURAL HERITAGE INFORMATION SYSTEM (NHIS) DATA REQUEST FORM

Please read the instructions on page 3 before filling out the form. Thank you!

WHO IS REQUESTING THE INFORMATION?

■ Mr.
Ms.

Name and Title Keith Kinnen, Environmental Specialist

Agency/Company Karvakko, P.A.

Mailing Address 2300 Bemidji Ave N., Suite 101, Bemidji, MN, 56601
(Street) (City) (State) (Zip Code)

Phone 218-444-8004 e-mail keith.kinnen@karvakko.com Responses will be sent via email. If you prefer US Mail check here: ☐

THIS INFORMATION IS BEING REQUESTED FOR A:

☑ Federal EA ☐ State EAW ☐ PUC Site or Route Application ☐ Watershed Plan ☐ BER
☐ Federal EIS ☐ State EIS ☐ Local Government Permit ☐ Research Project
☐ NEPA Checklist ☐ Other (describe) _____

☐ Check here if this project is funded through any of the following grant programs: Lessard-Sams Outdoor Heritage Council (L-SOHC), Conservation Partners Legacy (CPL), or Legislative-Citizen Commission on Minnesota Resources (LCCMR).

INFORMATION WE NEED FROM YOU:

1) **Enclose a map** of the project boundary/area of interest (topographic maps or aerial photos are preferred).
2) Please **provide a GIS shapefile*** (NAD 83, UTM Zone 15N) of the project boundary/area of interest.
3) List the following locational information* (attach additional sheets if necessary):

For Agency Use: TRS Confirmed ☐

For Agency Use: Region / MBS Status	County	Township #	Range #	Section(s) (please list **all** sections)
	Polk	148	40	32

4) Please provide the following information (attach additional sheets if necessary):

Project Name: Fosston Municipal Airport - Hangar Site Work and Hazard Mitigation

Project Proposer: City of Fosston

Description of Project (including types of disturbance anticipated from the project):

The proposed project includes construction of a hangar, removal of an existing parking apron, expansion of a parking apron, and removal of wetlands. Distrubance will include removal of 2.70 acres of wetland.

* Please see the instructions on page 3.

Describe the existing land use of the project site. What types of land cover / habitat will be impacted by the proposed project? The site is an active airport. The site is routinely mowed to maximize safety for aircraft and wildlife are discouraged from entering the area. Native plants that could potentially be food or cover for wildlife are also managed to minimize potential aircraft/wildlife conflicts

List any waterbodies (e.g., rivers, intermittent streams, lakes, wetlands) that may be affected by the proposed project, and discuss how they may be impacted (e.g., dewatering, discharge, riverbed disturbance).

Ouff Lake is located approximately 1000' to the NW, there are 3 delineated wetlands that will be impacted by the project totalling 2.70 acres

Does the project have the potential to affect any groundwater resources (e.g., groundwater appropriation, change in recharge, or contamination)?

No

To your knowledge, has the project undergone a previous Natural Heritage review? If so, please list the correspondence #: ERDB # No. How does this request differ from the previous request (e.g., change in scope, change in boundary, project being revived, project expansion, different phase)?

NA

To your knowledge, have any native plant community or rare species surveys been conducted within the site? If so, please list: No

List any DNR Permits or Licenses that you will be applying for or have already applied for as part of this project:

None with DNR

INFORMATION WE PROVIDE TO YOU:

1) The response will include a Natural Heritage letter. If applicable, the letter will discuss potential effects to rare features.

☐ Check here if you are interested in a list of rare features in the vicinity of the area of interest but you do **not** need a review of potential effects to rare features. Please list the reason a review is not needed:

_____

2) Depending on the results of the query or review, the response may include an Index Report of known aggregation sites and known occurrences of federally and state-listed plants and animals* within an approximate one-mile radius of the project boundary/area of interest. The Index Report and Natural Heritage letter can be included in any public environmental review document.

3) A Detailed Report that contains more information on each occurrence may also be requested. Please note that the Detailed Report may contain specific location information that is protected under *Minnesota Statutes*, section 84.0872, subd. 2, and, as such, the Detailed Report may not be included in any public document (e.g., an EAW).

☐ Check here if you would like to request a Detailed Report. Please note that if the results of the review are 'No Effects' or a standard comment, a Detailed Report may not be available.

FEES / TURNAROUND TIME

There is a fee* for this service. Requests generally take **3-4 weeks** from date of receipt to process, and are processed in the order received.

I have read the entire form and instructions, and the information supplied above is complete and accurate. I understand that material supplied to me from the Natural Heritage Information System is copyrighted and that I am not permitted to reproduce or publish any of this copyrighted material without prior written permission from the DNR. Further, if permission to publish is given, I understand that I must credit the Minnesota Division of Ecological and Water Resources, Minnesota Department of Natural Resources, as the source of the material.

Signature (**required**)	9/24/2019	Note: Digital signatures representing the name of a person shall be sufficient to show that such person has signed this document.

Mail or email completed form to:
Lisa Joyal, Endangered Species Review Coordinator
Division of Ecological and Water Resources
Minnesota Department of Natural Resources
500 Lafayette Road, Box 25
St. Paul, Minnesota 55155
Review.NHIS@state.mn.us

Online version of the form

Revised March 2, 2012

* Please see the instructions on page 3.

Instructions for the
Natural Heritage Information System (NHIS) Data Request Form

The Division of Ecological and Water Resources maintains the Natural Heritage Information System (NHIS), a collection of databases that provides information on Minnesota's rare plants and animals, native plant communities, and other rare features. The NHIS is continually updated as new information becomes available, and the Minnesota County Biological Survey (MBS) is a major source of this information.

- Use this form to request information on rare features within an approximate one-mile radius of an area of interest. You may reproduce this form for your own use or to distribute. An **electronic copy** of the form is available at the DNR's web site.

- If you are interested in obtaining the Rare Features Database electronically as a GIS shapefile, do not fill out this form. Please see this Natural Heritage Data document for more information on this option.

WHO IS REQUESTING THE INFORMATION?

- The person whose name is entered on the form under the "Who is Requesting the Information" section must sign the form as an acknowledgment of the State of Minnesota's copyright on all generated reports. All correspondence and invoices will be sent to this person. Please do not ask us to send this information to a different party.
- Please include a complete mailing address. Responses will be sent via email unless you specify differently.

INFORMATION WE NEED FROM YOU:

- Include a legible map (topographic maps or aerial photographs are preferred) clearly showing:

  1) location and boundaries of the project,
  2) associated infrastructure, and
  3) any waterbodies that may be affected by the proposed project.

- If the project boundary is large **or** complex, please provide a **GIS shapefile** (NAD 83, UTM Zone 15) of the project boundary/area of interest. Do not include any buffers. An additional "digitizing fee" may be charged for projects that require a substantial amount of time to digitize.
- Provide a complete list of sections that the proposed project or area of interest falls within. Do not include any buffer area. Please double-check this information. Incorrect sections can delay the processing of your request, and may result in an invalid review.
- Please provide a detailed **project description**, attaching separate pages to the form if necessary. Identify the type of development (e.g., housing, commercial, utility, ethanol facility, wind farm) being proposed, the size and # of units (if applicable), construction methods, and **any associated infrastructure** such as access roads, utility connections, and water supply and/or discharge pipelines.
- We cannot begin processing data requests until we receive all parts of the request, including a map and a completed, signed form.

INFORMATION WE PROVIDE TO YOU:

- The Natural Heritage review and database reports are valid for environmental review purposes for one year, and they are only valid for the project location and description provided on the form. Please contact Lisa Joyal at lisa.joyal@state.mn.us if project details change or if a data update is needed.
- Please note that the Natural Heritage review and database reports do not address/contain locations of the gray wolf (*Canis lupus*), state-listed as special concern, or Canada lynx (*Lynx canadensis*), federally-listed as threatened, as these species are not currently tracked in the Natural Heritage Information System. See page 4.

FEES / TURNAROUND TIME:

- There is a fee for this service. All fees are subject to change. The current fee schedule is available online. The minimum charge is $90.00, and increases based on the time it takes us to process the request (dependent upon project size and the results of the query). Please do not include payment with your request; an invoice will be sent to you.
- There is generally a **3-4 week turn-around time** to process requests.

PLEASE SEE NEXT PAGE FOR ADDITIONAL SOURCES OF INFORMATION

ADDITIONAL SOURCES OF INFORMATION:

- The DNR Rare Species Guide is the state's authoritative reference for Minnesota's endangered, threatened, and special concern species. It is a dynamic, interactive source that can be queried by county, ECS subsection, watershed, or habitat.

- Information on the gray wolf (*Canis lupus*):
  DNR website gray wolf Species Profile
  USFWS website Monitoring Report

- Information on the Canada lynx (*Lynx Canadensis*):
  DNR website Canada Lynx Species Profile
  USFWS website Canada Lynx profile

- Minnesota's Comprehensive Wildlife Conservation Strategy is an action plan focused on managing Minnesota's native animals whose populations are rare, declining, or vulnerable to decline. It identifies Species in Greatest Conservation Need and the Key Habitats that support them.

- The Minnesota Geospatial Commons allows users to download GIS shapefiles of MBS Sites of Biodiversity Significance, MBS Native Plant Communities, MBS Railroad Rights-of-Way Prairies, and Scientific and Natural Area Boundaries.

- Information on MBS Site Biodiversity Significance Ranks

- Information on MBS Native Plant Communities

- Questions? Please contact Lisa Joyal at 651-259-5109 or lisa.joyal@state.mn.us.

<u>NHIS Data Request</u>

Project Description: (Clipping taken from ongoing Draft EA document)

After consideration of the potential alternatives, Fosston Municipal Airport has chosen Alternative #4 as the preferred layout alternative. However, the Proposed Action will scale back the scope of work originally reviewed in Alternative #4. Fosston believes this is a more accurate amount of development that is "ripe" for development. The TENR reviewed proposed alternatives extending to 2030 and beyond. Alternate #4 includes the removal of 4 buildings, along with the construction of 8 new hangars. Realistically, Fosston will phase into this design, but will only develop a single hangar within the next 5 years. Fosston has also chosen both wildlife perimeter fence and wetland filling as the preferred wildlife hazard alternatives. Figure 3.0 and 3.1 located in the appendices of this document provide detailed illustrations of the Proposed Action. The following is a breakdown of how Fosston intends to achieve the proposed action.

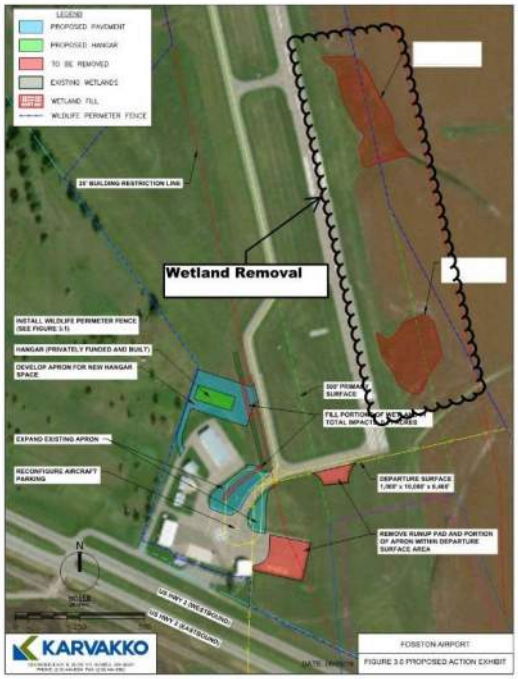


Exhibit 3-5 Wetland Removal

Wildlife hazards have surfaced as the highest priority for Fosston and will therefore be addressed before further development. As recommended by USDA in the WHSV report, and as analysis within this document has indicated appropriate, Wetlands 2 and 3 will be removed as illustrated on Exhibit 3-5. (For details and a full-size image, see Appendix B; Figure 3.0) There will be a total of 2.59 acres of impacts and both wetlands will be determined as jurisdictional requiring mitigation. Wetland impacts will be mitigated using the wetland banking method.

In order to remove the wetlands, subsoil from the surrounding uplands will be relocated into the wetland areas. Topsoil will first be removed and stockpiled away from the required excavation area. Once topsoil is removed, subsoil will then be pushed into the wetland areas with heavy equipment and contoured to allow drainage. When the desired subsurface contours are established, the salvaged topsoil will then be placed over the excavated areas and stabilized with vegetation.

Image (below)
Wetland 3, which is planned for removal.

Finished grade of the excavated areas will allow drainage without encouraging standing water. Wetland 2 will be sloped to the west into the existing ditch along Runway 34. Wetland 3 will be regraded and slope inward in order to allow the existing swale from the southeast to also reach the existing ditch along Runway 34. Proposed drainage is depicted on Figure 3.0 in Appendix B. Removal of the wetlands will alleviate concerns associated with the waterfowl and birds in the wetland area. It will complete the first of two required actions necessary to alleviate wildlife concerns at Fosston Municipal Airport. With the wetlands adjacent to the runway remove, pilots will no longer need to be concerned about birds or mammals frightening out of the wetlands and passing over the runway. However, until a wildlife perimeter fence is installed, mammals will still have access to the AOA posing the risk of potential wildlife strikes.

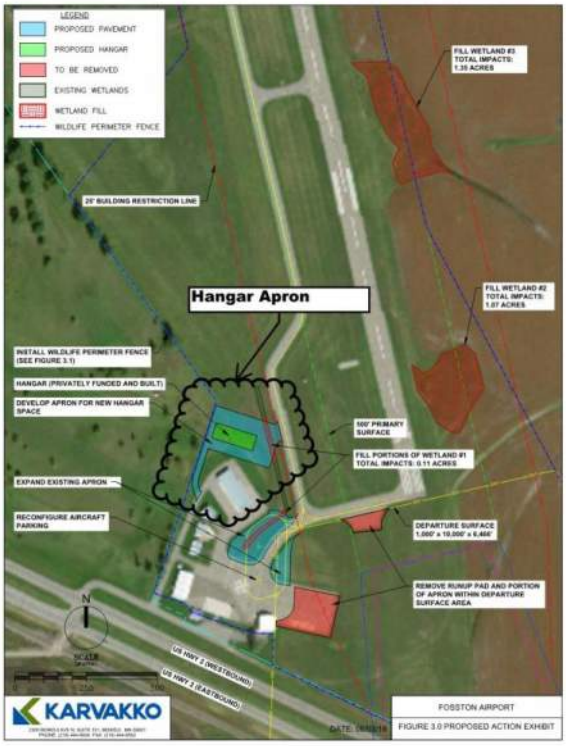


Exhibit 3-6 Hangar Apron

The Proposed Action will focus on addressing the hangar demand at the airport. Exhibit 2-2 illustrates an existing shortage of hangars space, which is projected to continually increase. A shortage of 10,100 square feet is projected in the next 5 years with the current conditions. Development of a hangar and apron will alleviate the shortage. Hangars at Fosston Municipal Airport are privately owned, and the land for the buildings are leased for a small fee. By allowing Fosston to provide reasonable hangar fees, and avoiding large costs associated with hangar maintenance, this method has served Fosston well in the past.

Work will include the design, development and construction of a new hangar, apron, and taxilane access. Work will be located north of the existing hangars. The hangar building and surrounding apron will be designed and constructed privately, according to the proposed layout. Prior to development of the hangar, a 25’ wide taxilane will be constructed north of the propose hangar. The taxilane access will be constructed of bituminous and provide an additional connection to the taxiway, which will improve circulation. The hangar owner will then be responsible for connecting any portions of taxilane to the apron and building.

Construction of the taxilane will result in minor impacts to Wetland 1. However, the impacts will be less than one tenth of an acre and the impacted wetland is a constructed ditch. *The photo (right) is Wetland 1 from the south.* It shows the wetland is a ditch constructed west along the Taxiway. We do not anticipate any permitting, or mitigation requirements for wetland impacts associated with the apron development.

The additional hangar space will allow Fosston Municipal Airport to meet the existing demand. As illustrated and discussed in Alternative Layout #4, it also allows for continued expansion to the north, as demand increases.

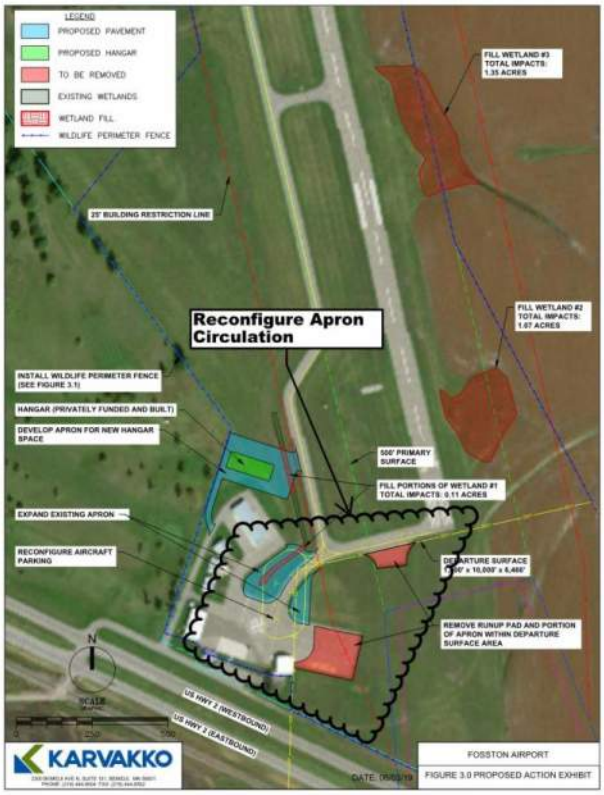


Exhibit 3-7 Remove nonconforming structures

The proposed action also includes redevelopment of the apron circulation area, including the design, bidding and construction phases.
The portion of the apron located in the departure surface does not meet FAA design standards. Since these portions of apron are nearing the end of their useful life, they will be removed. Lost apron space will be accounted for by infilling and expanding the existing apron to the north. Aircraft parking will be relocated to the expanded apron in order to remove it from the departure surface area. The result will be a large apron with easy access to the hangar areas and space to relocate aircraft parking. This relocated parking area will be designed with six tie downs for smaller single engine aircraft, which will accommodate the forecasted need within the next 5 years.

The expansion of the apron will result in minor impacts to Wetland 1. Similar to impacts anticipated from the hangar apron, wetland impacts will be minor and no permitting or mitigation is anticipated.

Because there aren't conforming taxilanes, a fueling aircraft can delay traffic from accessing the airfield or other locations within the building area. The reconfigured apron will improve circulation in this area by allowing easy access to aircraft fueling and tenant hangars. The additional pavement will also provide efficient circulation around the relocated aircraft parking.

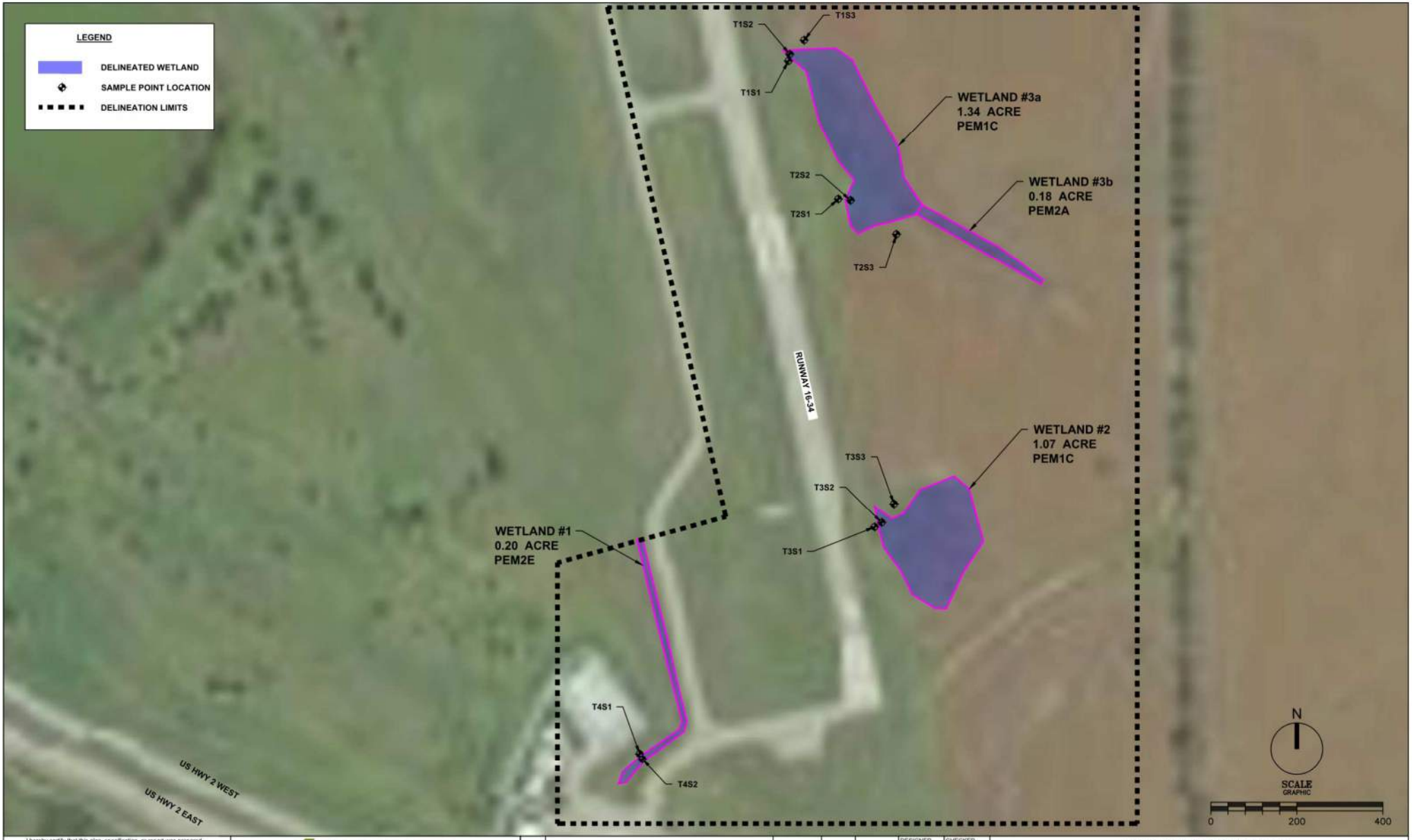
The Proposed Action also includes a second step of the wildlife hazard mitigation. Wetlands are estimated for removal in 2020 to eliminate concerns related to birds and the tall wetland vegetation encroaching the runway. However, the runway will still be fully accessible to deer and other wildlife. As recommended by USDA in the WHSV, a wildlife perimeter fence will be installed around the airport.

Posts for the fence will be pounded into the ground using mechanical equipment to an estimated depth of 4' below the surface. Posts located in wetland areas will be installed using the same methods, but will be pounded to whatever depth necessary to achieve stability. To avoid rutting or other impacts to wetlands caused by the equipment, timber mats will be used, or work will be completed while conditions are frozen. Because posts do not alter hydrology or vegetation, they are not considered an impact to wetlands.

The completion of the wildlife perimeter fence, in addition to wetland removals will fully achieve recommendations from USDA in the WHSV report, and dramatically reduce any potential wildlife hazards at Fosston Municipal Airport.

Exhibit 3-8 Wildlife Perimeter Fence

Figure 5: Wetland Delineation



I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Certified Wetland Delineator under the laws of the State of Minnesota.

Certified By: _____ Lic. No. 1244

Printed Name: Keith E. Kinnen Date 2/13/19

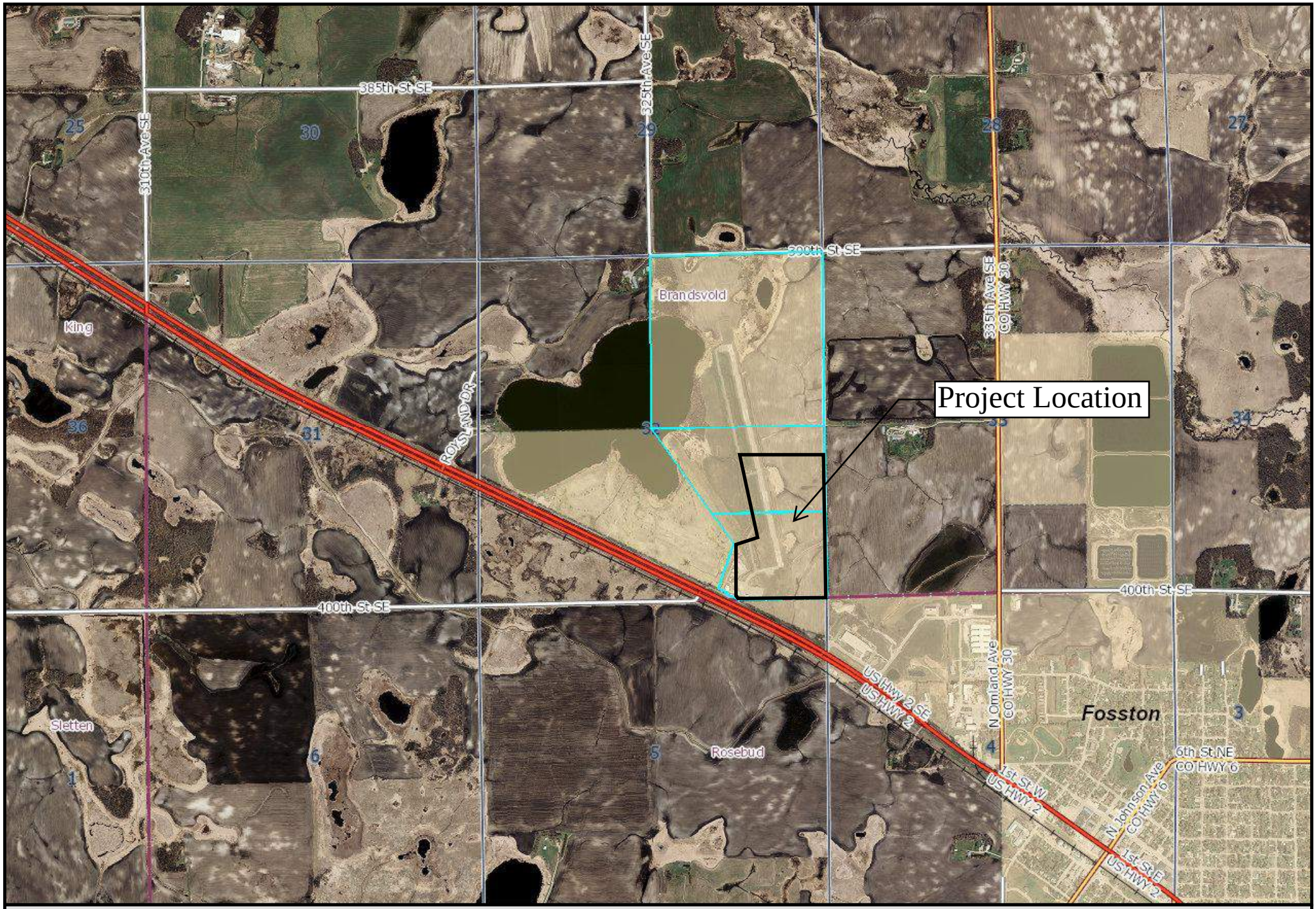
KARVAKKO

2300 BEMIDJI AVE N, SUITE 101, BEMIDJI, MN 56601
PHONE: (218) 444-8004 FAX: (218) 444-8563

NO.	REVISIONS	BY	APR.	DATE
	UPDATED WETLAND #3 BOUNDARY AND DELINEATION LIMITS PER TEP	KEK	KEK	7/10/2019

DESIGNED KEK	CHECKED KEK
DRAWN ERF	APPROVED KEK
DATE 07/18/18	JOB NO. 18-007

WETLAND OVERVIEW MAP
FOSSTON MUNICIPAL AIRPORT
POLK COUNTY, MINNESOTA



POLK COUNTY GIS

N

Fosston Municipal Airport

9/24/2019

These data are provided on an "AS-IS" basis, without warranty of any type, expressed or implied, including but not limited to any warranty as to their performance, merchantability, or fitness for any particular purpose.

NHIS Response

DEPARTMENT OF NATURAL RESOURCES

Minnesota Department of Natural Resources
Division of Ecological & Water Resources
500 Lafayette Road, Box 25
St. Paul, MN 55155-4025

December 13, 2019
Correspondence # ERDB 20200146

Mr. Keith Kinnen
Karvakko Engineering, P.A.
2300 Bemidji Ave N, Suite 101
Bemidji, MN 56619

RE: Natural Heritage Review of the proposed Fosston Municipal Airport Hanger Expansion, T148N R40W Section 32; Polk County

Dear Mr. Kinnen,

As requested, the above project has been reviewed for potential effects to known occurrences of rare features. Given the project details provided with the data request form, I do not believe the proposed project will negatively affect any known occurrences of rare features.

The Natural Heritage Information System (NHIS), a collection of databases that contains information about Minnesota's rare natural features, is maintained by the Division of Ecological and Water Resources, Department of Natural Resources. The NHIS is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, native plant communities, and other natural features. However, the NHIS is not an exhaustive inventory and thus does not represent all of the occurrences of rare features within the state. Therefore, ecologically significant features for which we have no records may exist within the project area. **If additional information becomes available regarding rare features in the vicinity of the project, further review may be necessary.**

For environmental review purposes, the results of this Natural Heritage Review are valid for one year; the results are only valid for the project location (noted above) and the project description provided on the NHIS Data Request Form. Please contact me if project details change or for an updated review if construction has not occurred within one year.

The Natural Heritage Review does not constitute review or approval by the Department of Natural Resources as a whole. Instead, it identifies issues regarding known occurrences of rare features and potential effects to these rare features. If needed, please contact your DNR Regional Environmental Assessment Ecologist to determine whether there are other natural resource concerns associated with the proposed project. Please be aware that additional site assessments or review may be required.

Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources. Please include a copy of this letter in any state or local license or permit application. An invoice will be mailed to you under separate cover.

Sincerely,

Samantha Bump

Samantha Bump
Natural Heritage Review Specialist
Samantha.Bump@state.mn.us

Links: DNR Regional Environmental Assessment Ecologist Contact Info
http://www.dnr.state.mn.us/eco/ereview/erp_regioncontacts.html

EPA Comments on Draft EA

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

03/23/2020

REPLY TO THE ATTENTION OF: RM-19J

Josh Fitzpatrick
Environmental Protection Specialist
Federal Aviation Administration
Dakota-Minnesota Airport District Office
6020 28th Avenue South, Room 102
Minneapolis, Minnesota 55450

Re: Environmental Assessment for Fosston Municipal Airport Site Work and Hazard Mitigation Project, City of Fosston, Polk County, Minnesota

Dear Mr. Fitzpatrick:

The U.S. Environmental Protection Agency has reviewed the Environmental Assessment (EA) referenced above. Our comments are provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act. The Federal Aviation Administration is the lead agency under NEPA, and Fosston Municipal Airport is the project proponent.

The project would modify landside and airside facilities in order to accommodate demand for hangar space, improve aircraft circulation, and mitigate wildlife hazards. Proposed actions include (1) a phased approach to removing four buildings and constructing eight new hangars, (2) installing a perimeter fence, (3) filling in two wetlands totaling 2.59 acres of impacts, (3) and altering some paved surface locations (page 15-16). Our enclosed detailed comments offer recommendations to assist in minimizing environmental impacts related to air quality, noise, children's health, climate resiliency, and energy consumption.

We appreciate the opportunity to comment. If you would like to discuss our comments, please contact Jen Tyler, the lead reviewer for this project, at 312-886-6394 or tyler.jennifer@epa.gov.

Sincerely,

Kenneth A. Westlake
Deputy Director
Office of Tribal and Multi-Media Programs

Enclosures: (1) EPA's Detailed Comments, (2) Construction Emission Control Checklist
CC Via Email: Keith Kinnen, Project Consultant, Karvakko P.A.

EPA'S DETAILED COMMENTS ON THE ENVIRONMENTAL ASSESSMENT FOR FOSSTON MUNICIPAL AIRPORT SITE WORK AND HAZARD MITIGATION PROJECT, CITY OF FOSSTON, POLK COUNTY, MINNESOTA

Air Quality

The proposed project would result in temporary fugitive dust and diesel exhaust emissions from construction activities, such as material hauling and use of heavy machinery. The EA states that equipment will not be allowed to idle for long periods of time, but specific timelines are not provided (page 20). In addition, expanding hangar capacity may result in an increase in flight activity and associated emissions.

Recommendations:

- Identify measures to minimize air emissions during construction. For example, consider specific idling time limits to ensure expectations are clear to workers and emissions are minimized. Consider encouraging construction teams to use applicable practices in the enclosed Construction Emission Control Checklist.
- Provide an estimate of increases to operational emissions that are likely to result from full project implementation. Consider airplane idling, taxiing, takeoff, flights, and landing.
- Estimate differences in operational emissions between project alternatives.
- Discuss best practices for minimizing operational emissions, such as strategic placement of facilities and scheduling to minimize taxiing and airport congestion.

Noise

Increasing hangar space at the airport may increase operations, which could increase noise impacts for nearby residents.

Recommendations:

- Consider residents, schools, daycares, hospitals, nursing homes and other nearby sensitive receptors.
- Assess whether nearby sensitive receptors may experience an increase in noise if the project is fully implemented. If increases in noise may occur, quantify expected increase.
- If warranted with full build out, consider measures to minimize impacts. Protective measures may include restricting flight times or patterns and/or upgrading windows or insulation to control noise in affected buildings.

Resiliency & Stormwater Management

The U.S. Global Change Research Program reports that across the Midwestern U.S., statistically significant increases in flooding are well documented, and these increases in flood risk and severity are attributed mostly to increases in precipitation.[1]

[1] U.S. Global Change Research Program, 2017 Climate Science Special Report: Fourth National Climate Assessment (NCA4), Volume 1, page 241.

Recommendations:

- Consider changing precipitation, flooding, and temperature conditions, as reported by the U.S. Global Change Research Program.
- Assess whether project structures would likely be resilient to such changes.
- If needed, incorporate resiliency and adaptation measures or plans. For example, consider incorporating permeable pavements when suitable and planning for additional stormwater. Use EPA's Climate Change Adaptation Resource Center as a tool to identify appropriate mitigation strategies, available at: https://www.epa.gov/arc-x.

Children's Health and Safety

Executive Order 13045 on Children's Health and Safety directs each federal agency to make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and to ensure that its policies, programs, activities, and standards address these risks.

Recommendations:

Require construction contractors to establish material hauling routes away from places where children live, learn, and play, to the extent feasible. Consider homes, schools, daycare centers, and playgrounds. In additional to air quality benefits, careful routing may protect children from vehicle-pedestrian accidents.

Energy Efficiency & Environmental Best Practices

Energy efficient design and material selection could reduce operations costs, while also better protecting the environment. Recyling construction debris also preserves valuable landfill space and makes use of materials that have high embodied energy.

Recommendations:

- Consider best practices for energy efficiency and sustainable building design for the new hangars. Examples include south-facing skylights and windows, motion-sensored lighting, use of Energy Star certified products, and incorporating renewable energy onsite.
- Consider Leadership in Energy and Environmental Design (LEED) and other green building programs, as well as designing for net-zero energy usage. In addition to reducing the overall environmental footprint, green building certification programs promote health by encouraging practices that protect indoor air quality.
- Consider incorporating electric vehicle charging stations in the parking areas.

U.S. Environmental Protection Agency
Construction Emission Control Checklist

Mobile and Stationary Source Diesel Controls

Purchase or solicit bids that require the use of vehicles that are equipped with zero-emission technologies or the most advanced emission control systems available. Commit to the best available emissions control technologies for project equipment in order to meet the following standards.

- On-Highway Vehicles: On-highway vehicles project should meet, or exceed, the U.S. EPA exhaust emissions standards for model year 2010 and newer heavy-duty, on-highway compression-ignition engines (e.g., long-haul trucks, refuse haulers, shuttle buses, etc.).[2]
- Non-road Vehicles and Equipment: Non-road vehicles and equipment should meet, or exceed, the U.S. EPA Tier 4 exhaust emissions standards for heavy-duty, non-road compression-ignition engines (e.g., construction equipment, non-road trucks, etc.).[3]
- Locomotives: Locomotives servicing infrastructure sites should meet, or exceed, the EPA Tier 4 exhaust emissions standards for line-haul and switch locomotive engines where possible. [4]
- Low Emission Equipment Exemptions: The equipment specifications outlined above should be met unless: 1) a piece of specialized equipment is not available for purchase or lease within the United States; or 2) the relevant project contractor has been awarded funds to retrofit existing equipment, or purchase/lease new equipment, but the funds are not yet available.

Consider requiring the following best practices through the construction contacting or oversight process:

- Use onsite renewable electricity generation and/or grid-based electricity rather than diesel-powered generators or other equipment.
- Use ultra-low sulfur diesel fuel (15 ppm maximum) in construction vehicles and equipment.
- Use catalytic converters to reduce carbon monoxide, aldehydes, and hydrocarbons in diesel fumes. These devices must be used with low sulfur fuels.
- Use electric starting aids such as block heaters with older vehicles to warm the engine.
- Regularly maintain diesel engines to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance (e.g., blue/black smoke indicates that an engine requires servicing or tuning).
- Retrofit engines with an exhaust filtration device to capture diesel particulate matter before it enters the construction site.
- Repower older vehicles and/or equipment with diesel- or alternatively-fueled engines certified to meet newer, more stringent emissions standards (e.g., plug-in hybrid-electric

[2] http://www.epa.gov/otaq/standards/heavy-duty/hdci-exhaust.htm
[3] http://www.epa.gov/otaq/standards/nonroad/nonroadci.htm
[4] http://www.epa.gov/otaq/standards/nonroad/locomotives.htm

vehicles, battery-electric vehicles, fuel cell electric vehicles, advanced technology locomotives, etc.).

- Retire older vehicles, given the significant contribution of vehicle emissions to the poor air quality conditions. Implement programs to encourage the voluntary removal from use and the marketplace of pre-2010 model year on-highway vehicles (e.g., scrappage rebates) and replace them with newer vehicles that meet or exceed the latest U.S. EPA exhaust emissions standards.

Fugitive Dust Source Controls

- Stabilize open storage piles and disturbed areas by covering and/or applying water or chemical/organic dust palliative, where appropriate. This applies to both inactive and active sites, during workdays, weekends, holidays, and windy conditions.
- Install wind fencing and phase grading operations where appropriate, and operate water trucks for stabilization of surfaces under windy conditions.
- When hauling material and operating non-earthmoving equipment, prevent spillage and limit speeds to 15 miles per hour (mph). Limit speed of earth-moving equipment to 10 mph.

Occupational Health

- Reduce exposure through work practices and training, such as turning off engines when vehicles are stopped for more than a few minutes, training diesel-equipment operators to perform routine inspection, and maintaining filtration devices.
- Position the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, reducing the fume concentration to which personnel are exposed.
- Use enclosed, climate-controlled cabs pressurized and equipped with high-efficiency particulate air (HEPA) filters to reduce the operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any incoming air is filtered first.

Responses to EPA Comments

Responses to EPA

Below are responses to each of the sections in EPA's comment letter.

Air Quality:

- Idle times for construction equipment will be limited to 1 hour. The document has been updated with appropriate language.
- Document was updated to explain low idle times for planes during takeoff and landing.
- No significant air emissions would be anticipated with any of the proposed alternatives.

Noise:

- Document was updated with language considering the sensitive receptors recommended.
- Even with full build out, noise levels would not increase enough to have impacts. The airport and surrounding areas are zoned appropriately to prevent noise-sensitive establishments from locating in the area.

Resiliency & Stormwater Management:

- Temperature conditions, as reported by the U.S. Global Change Research Program, have been considered and do not change how Fosston will address resiliency & stormwater management.

Children's Health and Safety:

- A paragraph was added considering the proposed haul routes in relation to the sensitive receptors suggested.

Energy Efficiency & Environmental Best Practices:

- The proposed project does not include buildings – only the apron in which a private owner will build the hangar. Comments on energy efficiency related to buildings are not applicable.
- No parking is proposed with the proposed project.

Mobile and Stationary Source Diesel Controls:

- Comments on zero-emission, and emission control technologies have been considered and will be encouraged. Thank you.

Fugitive Dust Source Controls:

- Dust control of stockpiles and the construction site is a standard practice, and will be implemented through the applicable bid documents.

Occupational Health:

- The document has been updated to limit idle times of equipment to 1 hour.

MPCA Comments on Draft EA and Responses

March 23, 2020

Keith Kinnen
Karvakko, PA
2300 Bemidji Avenue North, Suite 101
Bemidji, MN 56601

Re: Fosston Municipal Airport Hanger Site Work and Hazard Mitigation Environmental Assessment

Dear Keith Kinnen:

Thank you for the opportunity to review and comment on the Environmental Assessment (EA) for the Fosston Municipal Airport project (Project) in the city of Fosston, Polk County, Minnesota. The Project consists of the construction of new hangars and wildlife hazard mitigation. Regarding matters for which the Minnesota Pollution Control Agency (MPCA) has regulatory responsibility or other interests, the MPCA staff has the following comments for your consideration.

General Comment
The EA appears to be missing a list of the permits and approvals required for the proposed Project.

Response: A column has been added to Table 7 for anticipated permits.

Section 3.3 Proposed Action
The proposed action outlined in the EA includes removal of four buildings. Please note that demolition activities must comply with state and federal regulations that require inspection of the structure for hazardous materials such as asbestos, lead based paint, light ballasts, thermostats, stored chemicals, ozone depleting chemicals, etc. All regulated facilities must have a thorough asbestos inspection conducted by a Minnesota Department of Health certified asbestos inspector for the presence of asbestos containing material (ACM). ACM is either friable or non-friable. All friable or ACM that will become friable during demolition, is considered regulated asbestos-containing materials (RACM). RACM must be abated prior to demolition activities. If abatement of 160 square feet, 260 linear feet, or 35 cubic feet of RACM is required, a licensed abatement contractor must be hired. For all demolitions, a "Notification of Intent to Perform a Demolition" must be submitted to the MPCA 10 working days prior to the start of demolition. Flaking lead based paint present on the structure must be encapsulated or removed and properly disposed of off-site at the appropriate disposal facility prior to demolition activities. Any lead based paint chips present on the ground following demolition must be removed and properly disposed of off-site at the appropriate disposal facility. A fact sheet regarding Lead Paint disposal is available on the MPCA website at: http://www.pca.state.mn.us/index.php/view-document.html?gid=9049. The Project proposer should also consider recycling as much of the structures materials as possible to reduce the volume of material disposed of in the landfill. If you have any questions regarding demolition issues or asbestos and lead paint abatement, please contact Kit Grayson at 218-302-6627 or Kit.Grayson@state.mn.us.

Response: No buildings are proposed for removal as part of the proposed action. This has been clarified in Section 3.3.

Section 4.7 Hazardous Materials, Solid Waste, and Pollution Prevention

- This section correctly states that a National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) Construction Stormwater (CSW) Permit will be required, perimeter controls will be installed prior to any soil disturbance, and all disturbed areas will be stabilized. However, since stormwater from the existing Project area ultimately drains to Uff (or Ouff) Lake, which is listed as impaired due to nutrients and has an approved total maximum daily load (TMDL), MPCA staff suggests that this section also state that the Project will comply with CSW Permit part 23.1 Additional Requirements for Discharges to Special (Prohibited, Restricted, Other) and Impaired Waters. Note that Item 23.9 of the CSW Permit states that Permittees must immediately initiate stabilization of exposed soil areas, as described in item 8.4, and complete the stabilization within seven (7) calendar days after the construction activity in that portion of the Site temporarily or permanently ceases.

Response: Language was added to Section 4.7 to clarify NPDES requirements adjacent to the impaired water.

- Please note that state law requires that persons properly manage contaminated soil and water they uncover or disturb - even if they are not the party responsible for the contamination. The MPCA recommends the Project proposer consider preparation of a Construction Contingency Plan in the event contaminated soil is encountered during demolition or construction activities. If contamination is encountered, it must be reported immediately to the state duty officer at 651-649-5451 or 800-422-0798.

Response: Language was added to Section 4.7 to clarify these requirements.

Section 4.14 Water Resources

- The EA needs to include the MPCA Clean Water Act Section 401 Water Quality Certification as a regulating entity that may require protection (and mitigation) to surface waters through best management practices (BMPs) during construction. The MPCA uses the definition of "Waters of the State" as defined in Minn. Stat. ch. 115.01 subd 22. to determine what waters are regulated by the MPCA. This definition is broader than the definition of "Waters of the U.S." used by the U.S. Army Corps of Engineers (USACE). Some waters that are not regulated by the USACE or under the Wetland Conservation Act (WCA), are regulated by the MPCA. When making an application for wetlands impacts for a proposed project, the applicant needs to include all impacts to all surface waters, even if those waters have been determined to be non-jurisdictional by the USACE or are WCA exempt. For further information about the 401 Water Quality Certification process, please contact Jim Brist at 651-757-2245 or Jim.Brist@state.mn.us.

  Response: Section 401 Certification was already discussed, but language was added to Section 4.14 to clarify requirements and specific coordination with MPCA.

- The statement in the EA "Stormwater runoff on the site is captured by drainage ditches and conveyed north to a wetland complex" is incomplete. There are two wetland complexes on site, and both appear to drain directly into or be directly connected to Uff (or Ouff) Lake. Furthermore, earlier on page 31, the EA states "The network of wetlands (on site) runs to the NW into Ouff Lake." Therefore, MPCA staff suggests the preceding statement should read, "Stormwater runoff on the site is captured by drainage ditches and conveyed north to a wetland complex, which then drains to the northwest into Ouff Lake." The MPCA suggests the EA also discuss that Uff (or Ouff) Lake is listed on the Minnesota 2018 Impaired Waters List as impaired for Aquatic Recreation use due to excessive nutrient and eutrophication biological indicators. Questions regarding impaired waters should be directed to Scott Schroeder at 218-846-8134 or Scott.t.schroeder@state.mn.us.

  Response: This language was included in the EA

- The EA states "The proposed layout would create approximately 1 acre of additional impervious surface." MPCA staff suggests stating exactly how much additional impervious surface will be created, not an approximate. If the Project creates 1 acre or more of new impervious surface, a permanent stormwater treatment system is required by CSW Permit, effectively eliminating any future discharge of stormwater to the on-site wetlands and Uff (Ouff) Lake. Treatment requirements and the treatment system must be designed to treat a minimum 1 inch of the water quality volume from the new impervious areas prior to discharge to the existing drainage ditches and wetlands. Infiltrating stormwater is the preferred method for airports unless it is prohibited due to soil conditions. Testing will need to be conducted to confirm that infiltration is feasible. If not, there is the option of water harvest and reuse. The downstream wetlands may not be utilized to treat stormwater unless they have gone through the mitigation process.

  Response: Total additional impervious proposed is 0.90 acres, therefore, no permanent BMP's required. This was clarified as suggested in the document.

- The EA states "There are no additional pollutant sources associated with the proposed project." MPCA staff suggests that the additional impervious surface created by the Project will result in increased stormwater runoff, thus increasing the site's pollution potential, especially if a permanent stormwater treatment system is not required and stormwater continues to discharge into Uff (Ouff) Lake. MPCA staff suggests the statement should read: "The increased stormwater runoff as a result of the new impervious surface is a potential additional pollutant source associated with the Project, and will be mitigated through the requirements of the NPDES Construction Stormwater Permit. Or, if a permanent stormwater treatment system will be constructed as part of the Project, MPCA staff suggests: "There are no additional pollutant sources associated with the proposed Project. Any

  additional stormwater runoff as a result of the new impervious surface will be treated in a permanent stormwater treatment system constructed with the Project." Questions regarding CSW should be directed to Roberta Getman at 507-206-2629 or Roberta.Getman@state.mn.us.

  Response: This language was added to the EA.

Section 5.0 Cumulative Potential Effects

The EA contains the following statement in the last paragraph of this section: "There is no resource which may be especially vulnerable to incremental impacts…" MPCA staff suggests Uff (Ouff) Lake is a resource that is particularly vulnerable if the increased stormwater runoff from the proposed facility continues to discharge to the lake, unless all CSW Permit requirements are followed and a permanent stormwater treatment system is constructed that eliminates stormwater discharge from reaching Uff (Ouff) Lake. MPCA staff strongly suggests that the stormwater runoff from the existing and proposed facility is mitigated to no longer discharge to Uff (Ouff) Lake.

Response: Thank you for your comment. Any cumulative stormwater generated from the site needs to run through approximately 3000 linear feet of vegetative swale (ditch). Since vegetative swales are an effective type of BMP, the likelihood of stormwater from the site having a negative impact on Ouf lake is very unlikely. If development gets closer to the lake, a permanent BMP will be considered.

We appreciate the opportunity to review this Project. Please provide your specific responses to our comments and notice of decision on the need for an Environmental Impact Statement**.** Please be aware that this letter does not constitute approval by the MPCA of any or all elements of the Project for the purpose of pending or future permit action(s) by the MPCA. Ultimately, it is the responsibility of the Project proposer to secure any required permits and to comply with any requisite permit conditions. If

you have any questions concerning our review of this EA, please contact me by email at Karen.kromar@state.mn.us or by telephone at 651-757-2508.

Sincerely,

Karen Kromar

Karen Kromar
Project Manager
Environmental Review Unit
Resource Management and Assistance Division

KK:bt

cc: Dan Card, MPCA, St. Paul
Kit Grayson, MPCA, St. Paul
Jim Brist, MPCA, St. Paul
Roberta Getman, MPCA, Rochester
Scott T. Schroeder, MPCA, Detroit Lakes
Jim Ziegler, MPCA, Detroit Lakes
Kenneth Westlake, USEPA

DNR Comments to Draft EA

DEPARTMENT OF NATURAL RESOURCES

Ecological and Water Resources
2115 Birchmont Beach Rd NE
Bemidji, MN 56601

April 1, 2020

Keith Kinnen, PA
Karvakko
2300 Bemidji Ave North
Suite 101
Bemidji, MN 56601

Draft EA, Fosston Airport Hangar Site Work and Hazard Mitigation

Keith Kinnen,

Thank you for the opportunity to review this proposed project. The Department of Natural Resources (DNR) has received and reviewed the draft Environmental Assessment and offers the following recommendations for inclusion in the final Environmental Assessment (EA):

- DNR requests estimates of both existing and proposed impervious surface coverage and estimated quantities and quality of run-off before and after the project and described measures to address potential stormwater and pollutant increases. Mitigation measures should address potential impacts to both surface and groundwater resources.

- DNR recommends the EA consider specific species behavior and habitat use when determining landscaping tactics to keep wildlife from encroaching on airport facilities. In particular, the filling of wetlands areas 1 and 2 is proposed to facilitate mowing of tall vegetation. However, DNR wildlife biologists advise areas of mowed turf are attractants to geese and other larger waterfowl. Taller vegetation is less attractive to geese for foraging, which maybe a benefit for airport operations.

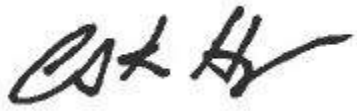
- DNR also advises reducing mowing frequencies and planting native grasses and forbs where possible. As noted in this article by USA Today, the City of Dayton is just one of several airports using tall grasses to reduce avian strikes by larger species. In addition to reducing attraction to geese, keeping taller native grasses and sedges will help to minimize run-off into nearby waterways and reduce impacts to wetlands.

- DNR would also like the EA to acknowledge that several species of birds may be entangled by barb-wire fences.

- Please note, any impacts to public waters Uff Lake and Unnamed Wetland from fencing or any other activities will require a public water work permit from MN DNR. Contact Area Hydrologist, Stephanie Klamm at Stephanie.klamm@state.mn.us for further information.

Thank you for your time and consideration of these comments. We look forward to reviewing the final Environmental Assessment.

Sincerely,



Sincerely,

Christine Herwig
EWR Northwest Assistant Regional Manager

CC: Jaimé Thibodeaux, Environmental Assessment Ecologist
Stephanie Klamm, Area Hydrologist
Tammy Baden, Shallow Lakes Specialist

Equal Opportunity Employer

Links:
USA Today, Dayton Ohio article
https://www.usatoday.com/story/todayinthesky/2014/08/12/airport-tests-new-way-to-avoid-deadly-bird-strikes-tall-grass/13975967/

Response to DNR Comments

Responses to DNR

Thank you for your comments. All the comments were considered. Below are applicable responses.

- The stormwater section has been updated to specify the total amount of additional impervious surface. It has also been updated to include a description how the stormwater will be treated with a grass swale before reaching the adjacent waters.
- A Wildlife Hazard Management Plan was conducted prior to the EA and is referenced throughout the document. The WHMP specifies specific species of concern, including waterfowl (such as geese).
- FAA guidelines identify specific safety zones in relation to Runways and Taxiways. These areas require clear sight for aircraft operators and must have mowed grass. In addition, FAA guidelines discourage the use of native, or tall grasses that could be inviting to various sorts of wildlife.
- A paragraph was added to the wetland section of the EA (page 33) describing the proposed work in the public water wetlands and the required public waters work permit that will be required.

United States Department Agriculture
Animal and Plant Health Inspection Service
Wildlife Services
34912 U.S. Hwy. 2
Grand Rapids, MN 55744
(218) 327-3350
(218) 326-7039 FAX

Letter from USDA

Date: 4/13/2020

Joshua Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office

Dear Mr. Fitzpatrick

As requested, I am writing to clarify the recommendations I made following the two-day Wildlife Hazard Site Visit (WHSV) I conducted at the Fosston Municipal Airport (KFSE) on May 23rd and 24th, 2017.

Please note that the recommendations made here, as were the recommendations made in the WHSV report are made strictly from a wildlife-hazard perspective and are not based on the economic feasibility of implementing the recommendations. The airport must make the determination as to the feasibility of incorporating these recommendations based on their regulatory obligations and financial constraints.

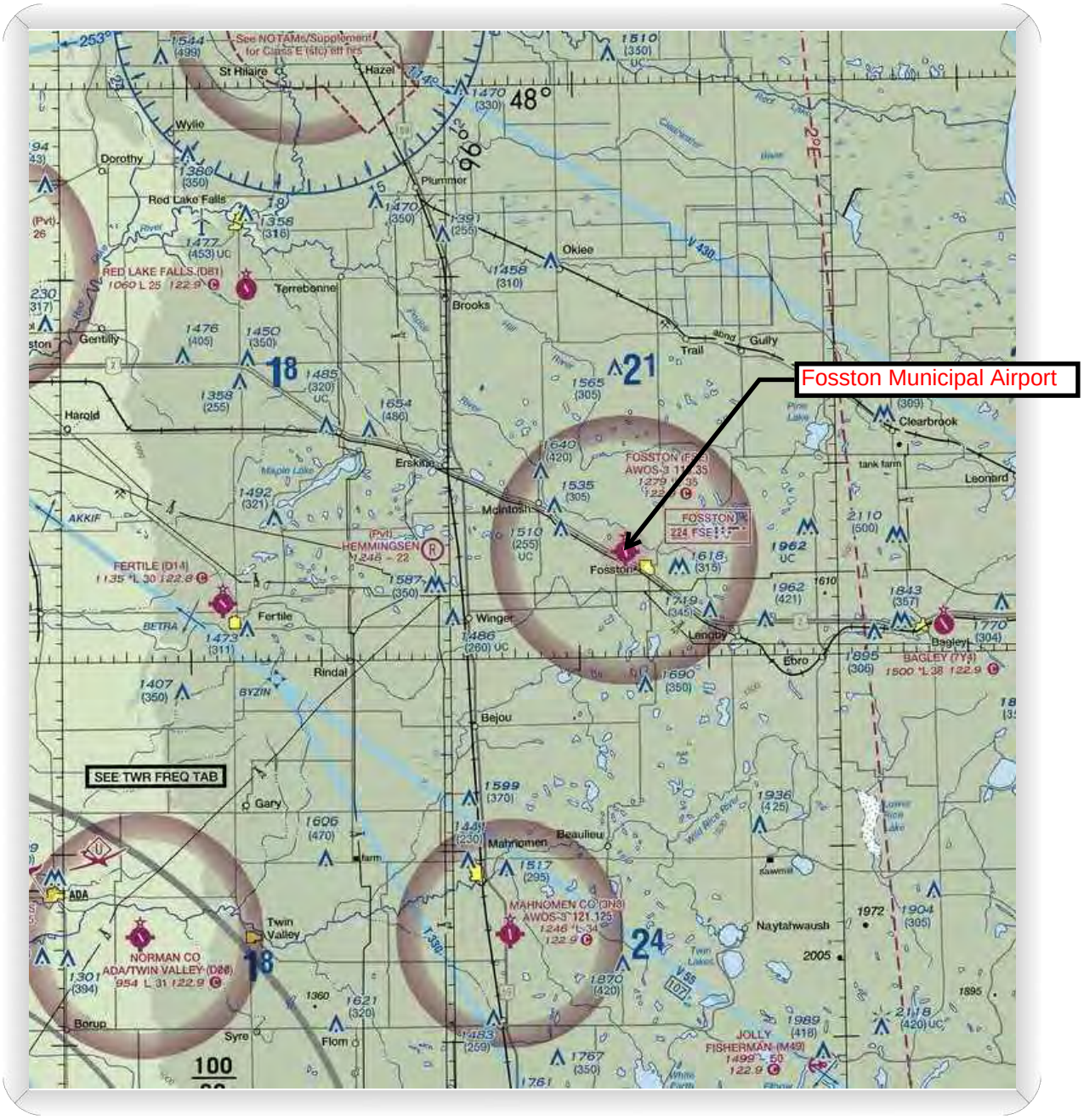
In the report, I recommended the removal of the two small wetlands that are adjacent to the airfield on the east side of Runway 16-34. The removal of these wetlands would certainly not eliminate the risk of waterfowl strikes by aircraft at KFSE due to several other wildlife attractants in the area, such as agricultural fields, wastewater treatment ponds, and other temporary and permanent water attractants. However, due to the attractiveness of the two wetlands to waterfowl and other wildlife, combined with the close proximity of these wetlands to the airfield, the removal of the wetlands would be an important incremental step to reduce wildlife (especially waterfowl) hazards at KFSE.

Sincerely

Duane P. Sahr
Certified Airport Biologist
USDA/APHIS/Wildlife Services

Appendix B: Figures

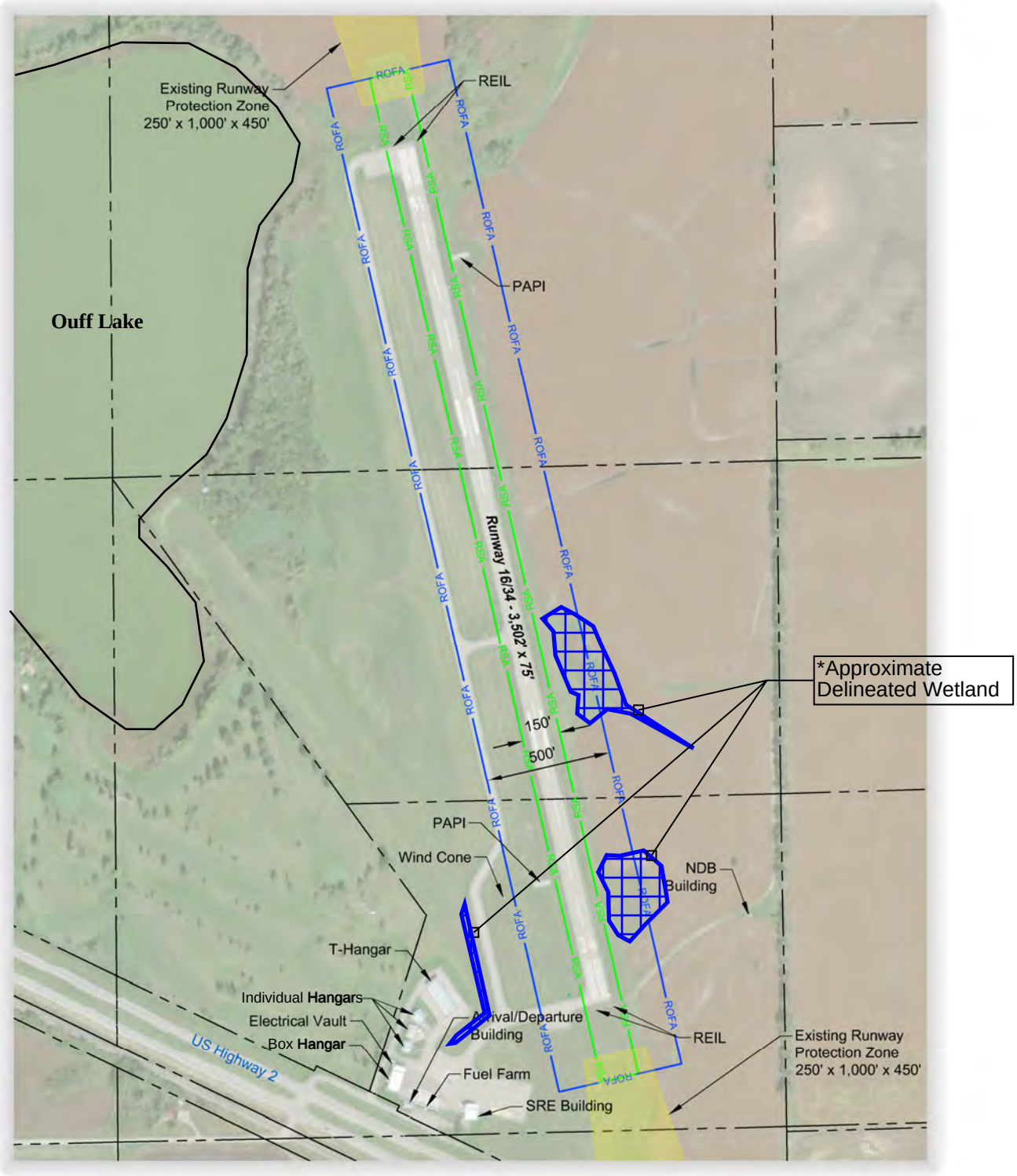
Figure 1: General Location



0 5 10 15
Graphic Scale in Miles

Source: *Sky Vector Aeronautical Charts (https://skyvector.com/)*

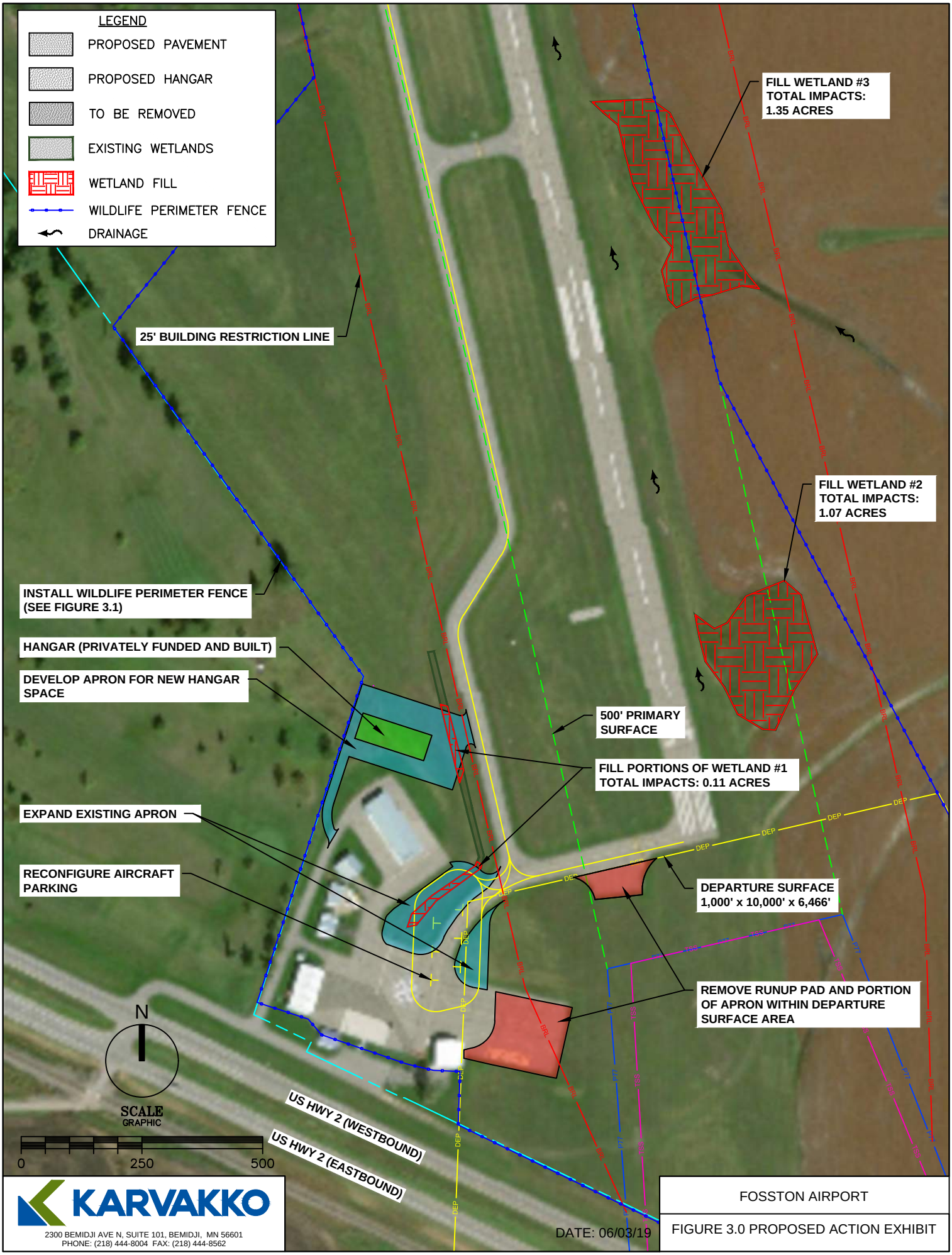
Figure 2: Existing Conditions



0 300 600 900
Graphic Scale in Feet

*** See Figure 5: Wetland Report & Wetland Report in Appendices for detailed wetland information.**

Source: Polk County, Minnesota Open Data Portal, Google Maps



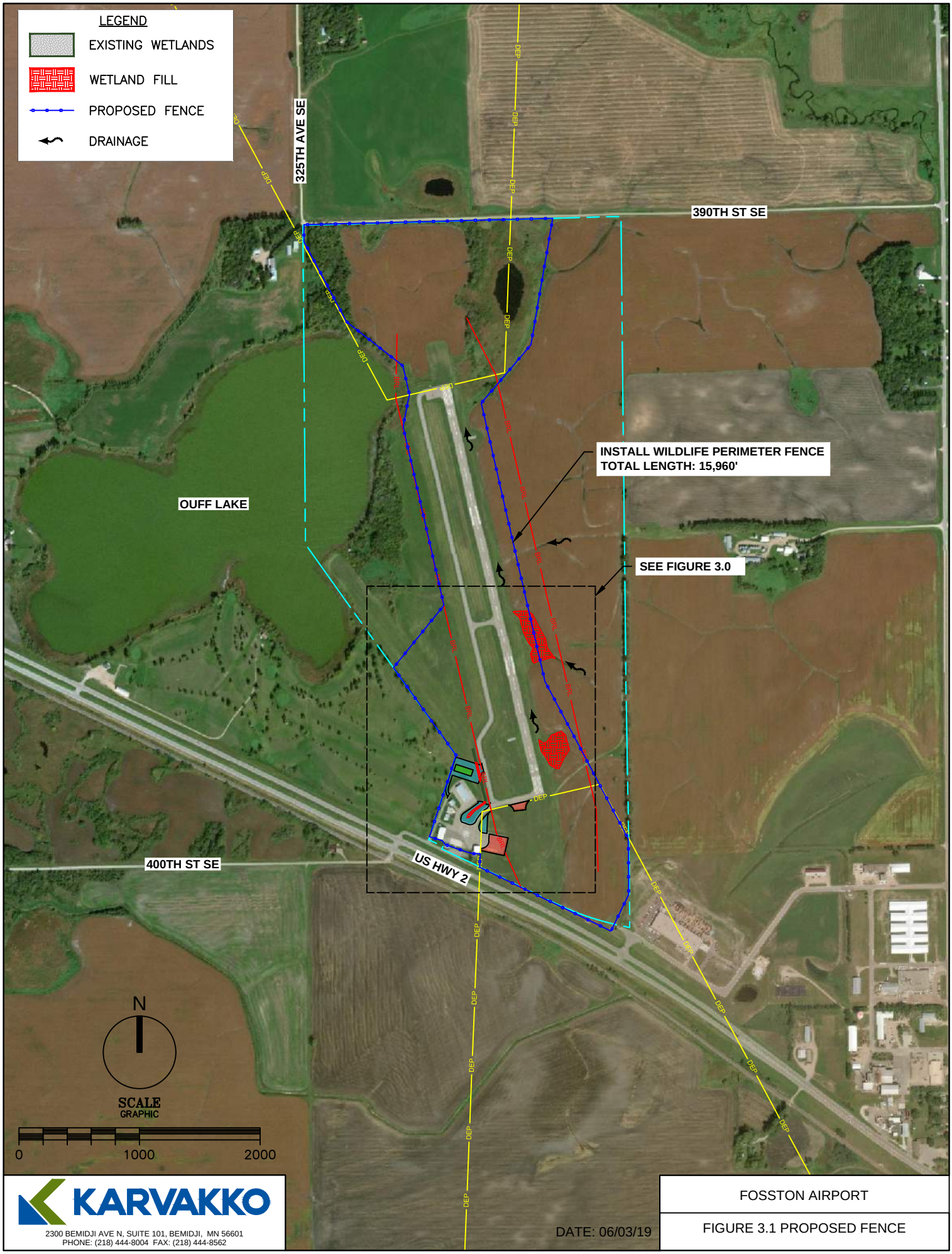
KARVAKKO

2300 BEMIDJI AVE N, SUITE 101, BEMIDJI, MN 56601
PHONE: (218) 444-8004 FAX: (218) 444-8562

DATE: 06/03/19

FOSSTON AIRPORT

FIGURE 3.0 PROPOSED ACTION EXHIBIT



KARVAKKO

2300 BEMIDJI AVE N, SUITE 101, BEMIDJI, MN 56601
PHONE: (218) 444-8004 FAX: (218) 444-8562

DATE: 06/03/19

FOSSTON AIRPORT

FIGURE 3.1 PROPOSED FENCE

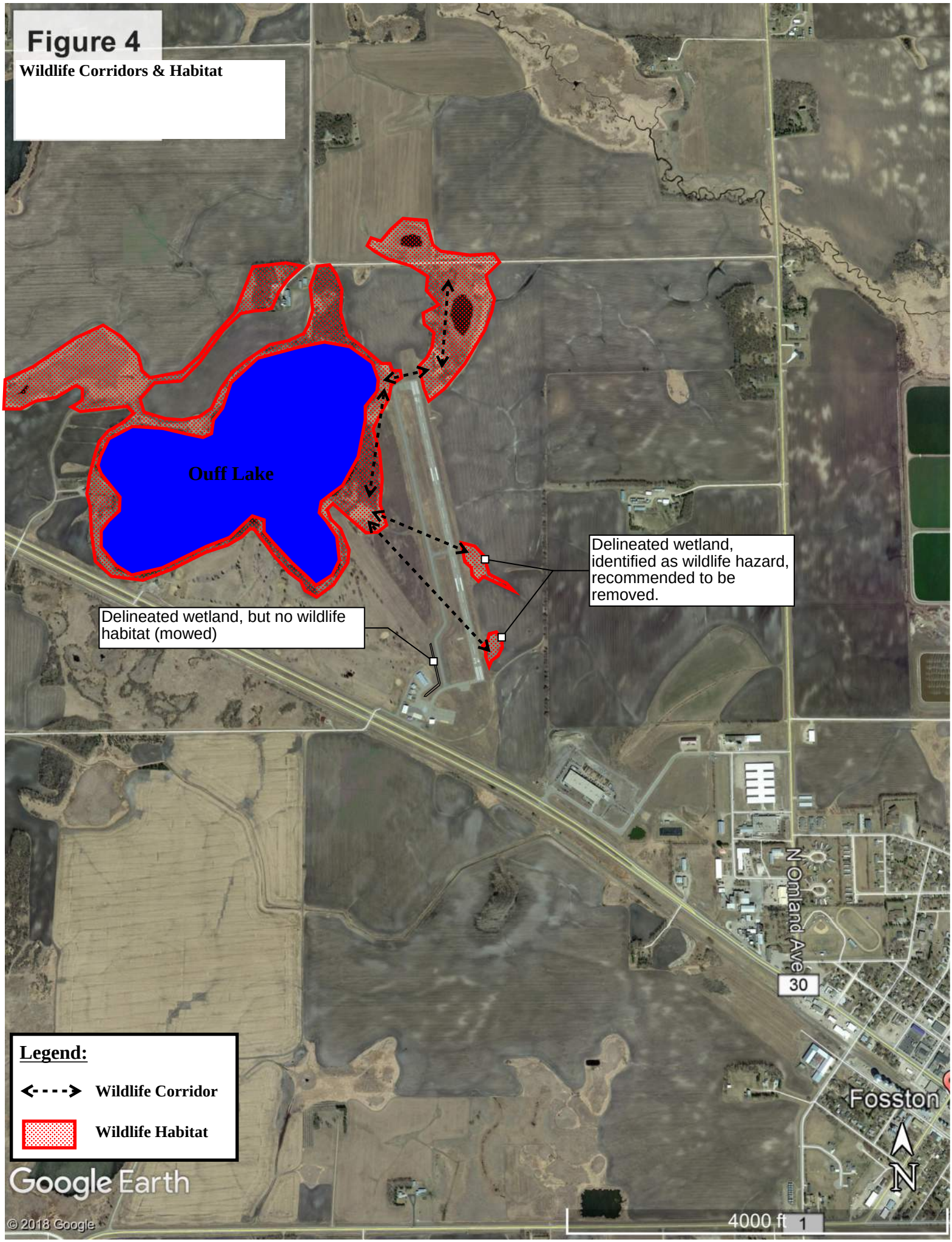
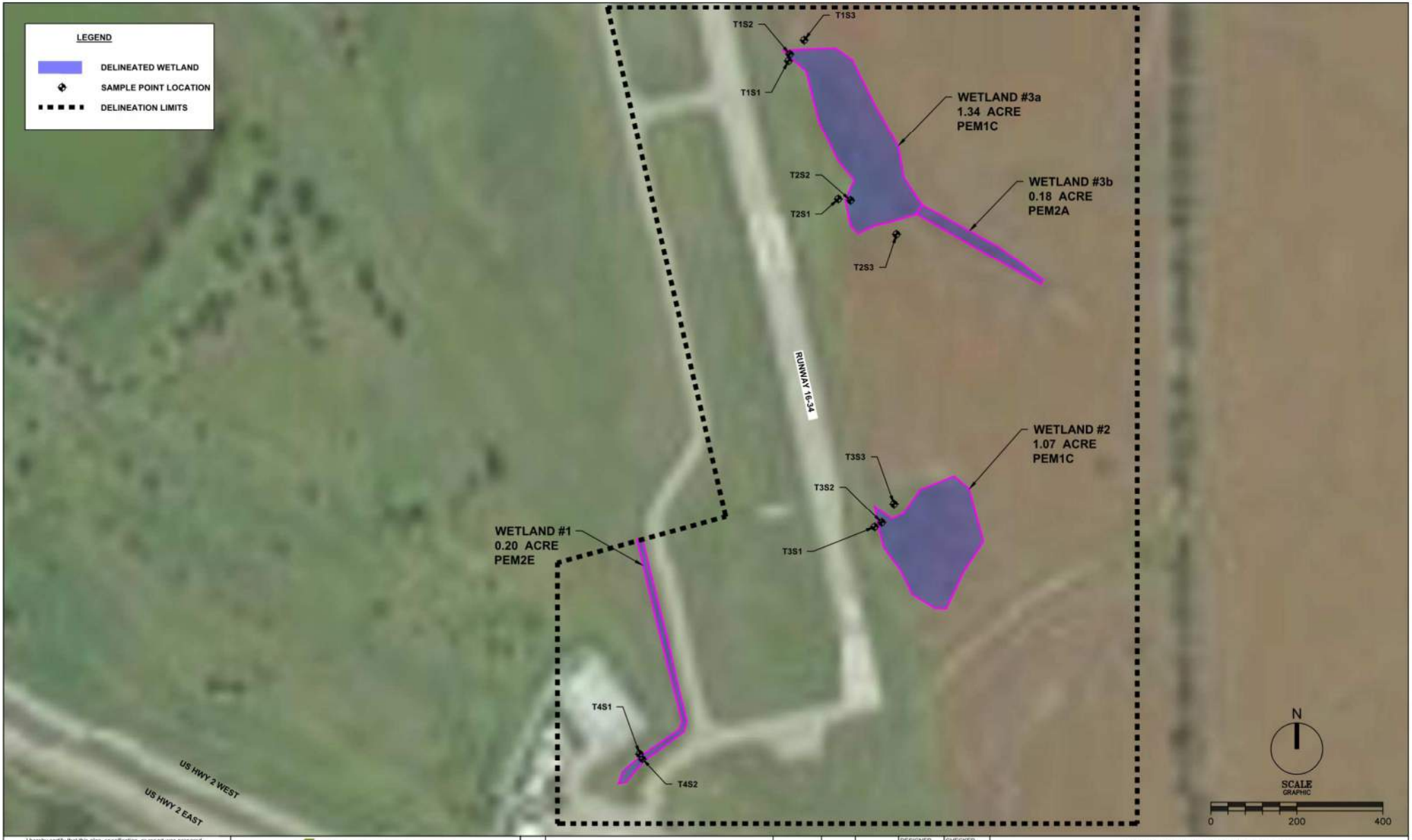


Figure 4
Wildlife Corridors & Habitat
Ouff Lake
Delineated wetland, identified as wildlife hazard, recommended to be removed.
Delineated wetland, but no wildlife habitat (mowed)
N Omland Ave
30
Fosston
Legend:
Wildlife Corridor
Wildlife Habitat
Google Earth
© 2018 Google
4000 ft
1
N

Figure 5: Wetland Delineation



I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Certified Wetland Delineator under the laws of the State of Minnesota.

Certified By: _____ Lic. No. 1244

Printed Name: Keith E. Kinnen Date 2/13/19

KARVAKKO

2300 BEMIDJI AVE N, SUITE 101, BEMIDJI, MN 56601
PHONE: (218) 444-8004 FAX: (218) 444-8563

NO.	REVISIONS	BY	APR.	DATE
	UPDATED WETLAND #3 BOUNDARY AND DELINEATION LIMITS PER TEP	KEK	KEK	7/10/2019

DESIGNED KEK	CHECKED KEK
DRAWN ERF	APPROVED KEK
DATE 07/18/18	JOB NO. 18-007

WETLAND OVERVIEW MAP
FOSSTON MUNICIPAL AIRPORT
POLK COUNTY, MINNESOTA

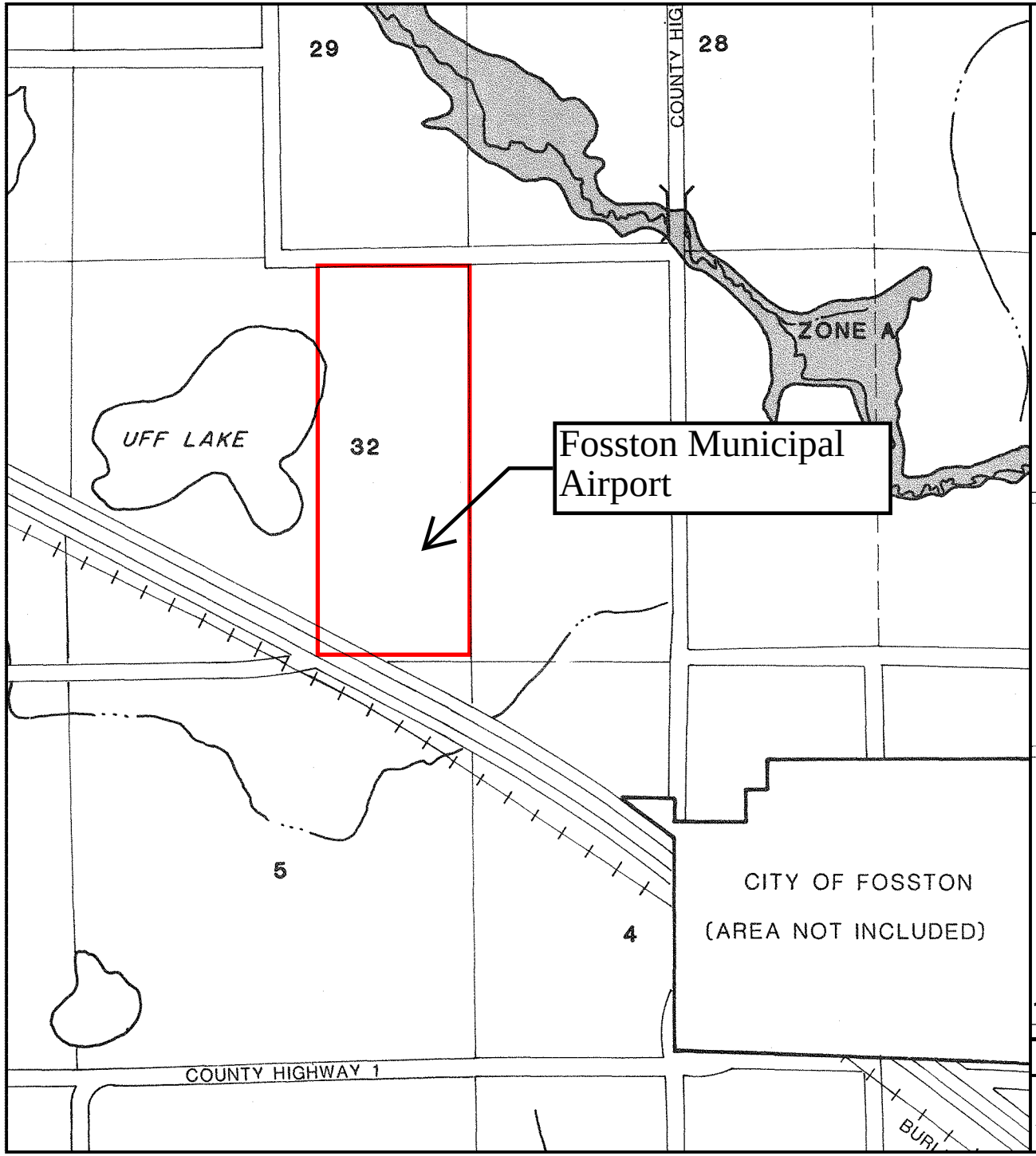
POLK COUNTY GIS

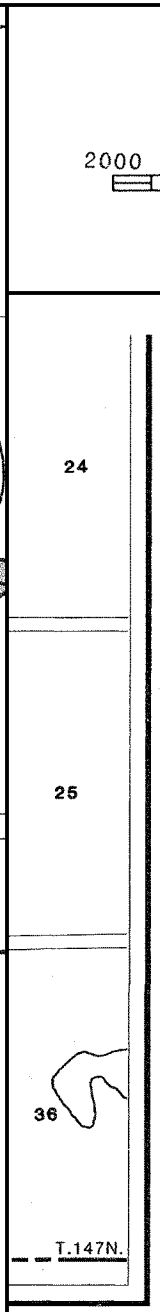
N

Fosston Municipal Airport

9/24/2019

These data are provided on an "AS-IS" basis, without warranty of any type, expressed or implied, including but not limited to any warranty as to their performance, merchantability, or fitness for any particular purpose.





APPROXIMATE SCALE

2000 0 2000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

COUNTY OF
POLK.
MINNESOTA
(UNINCORPORATED AREAS)

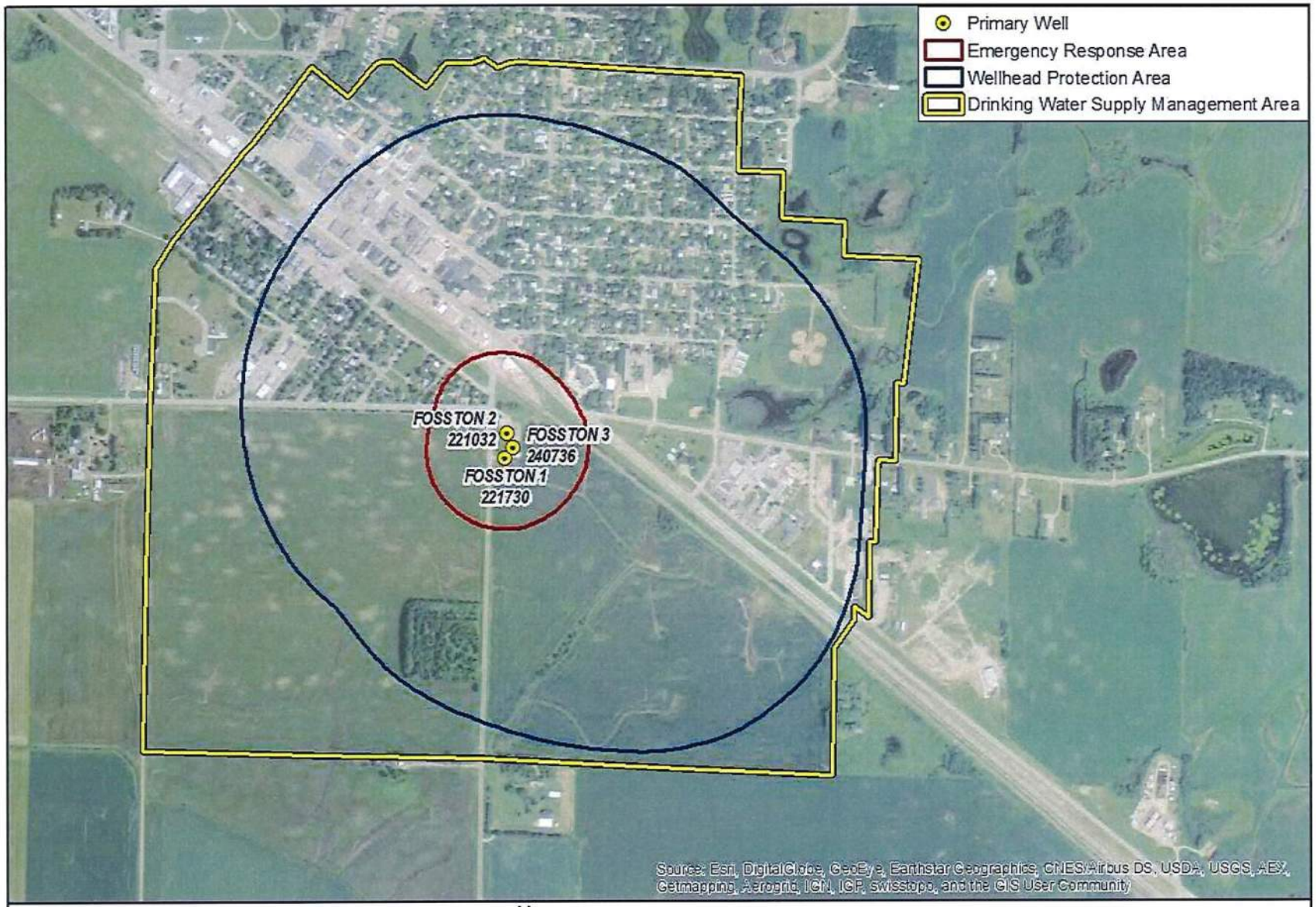
PANEL 525 OF 550
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
270503 0525 B

EFFECTIVE DATE:
AUGUST 15, 1983

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MINNESOTA MDH DEPARTMENT OF HEALTH

0 500 1,000 2,000
Feet

N

Figure 1
Wellhead Protection and Drinking Water Supply Management Area
City of Fosston

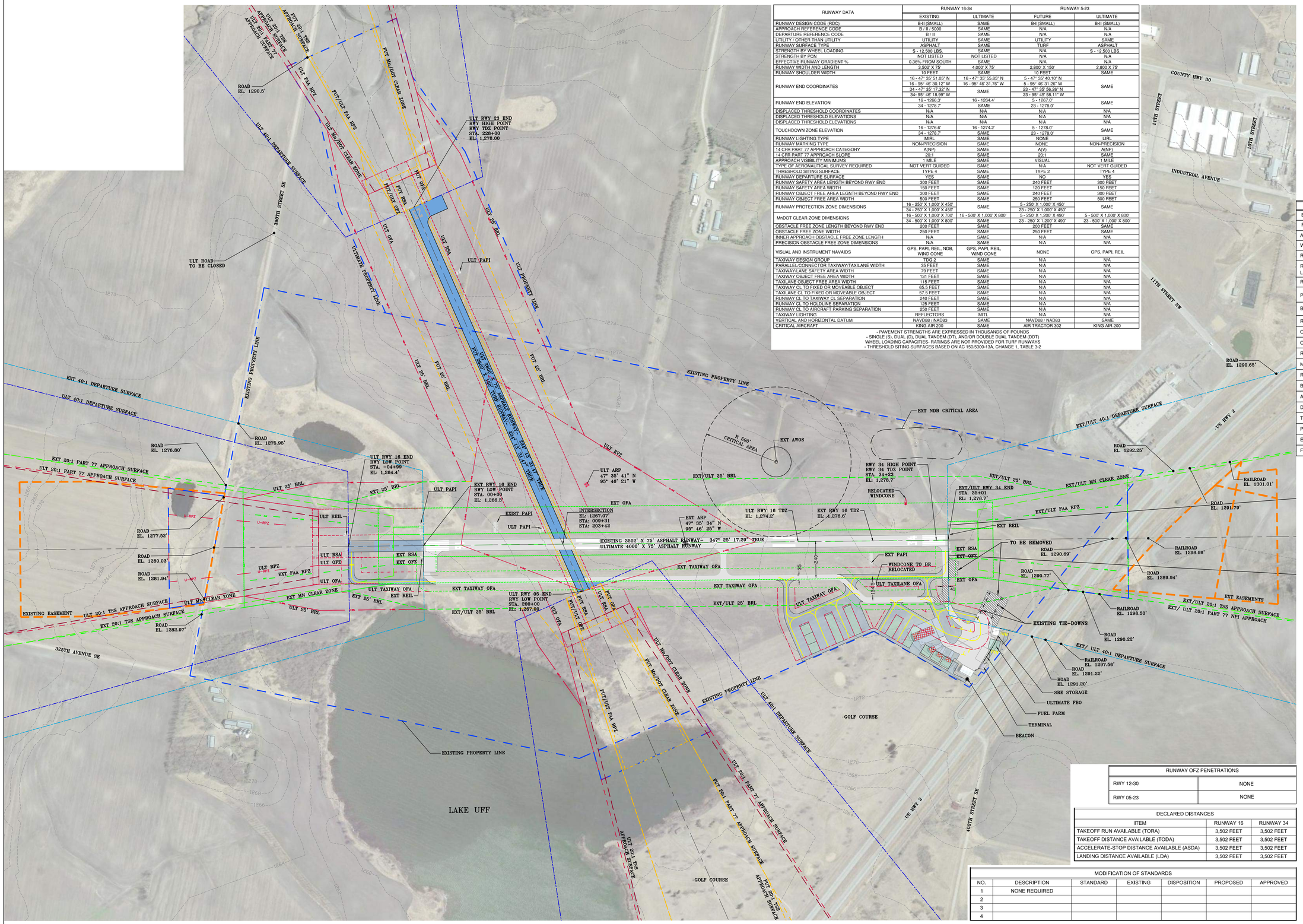
AIRPORT LAYOUT PLAN FOSSTON MUNICIPAL AIRPORT

Fosston, MN.

Revision	Date	Description	By
1	06/01/2018	Ultimate Terminal Area	

REVISED BY:

Mead&Hunt KARVAKKO



RUNWAY DATA	RUNWAY 16-34		RUNWAY 5-23	
	EXISTING	ULTIMATE	FUTURE	ULTIMATE
RUNWAY DESIGN CODE (RDC)	B-II (SMALL)	SAME	B-I (SMALL)	B-II (SMALL)
APPROACH REFERENCE CODE	B / II / 5000	SAME	N/A	N/A
DEPARTURE REFERENCE CODE	B / II	SAME	N/A	N/A
UTILITY / OTHER THAN UTILITY	UTILITY	SAME	UTILITY	SAME
RUNWAY SURFACE TYPE	ASPHALT	SAME	TURF	ASPHALT
STRENGTH BY WHEEL LOADING	S - 12,500 LBS.	SAME	N/A	S - 12,500 LBS.
STRENGTH BY PCN	NOT LISTED	NOT LISTED	N/A	N/A
EFFECTIVE RUNWAY GRADIENT %	0.36% FROM SOUTH	SAME	N/A	N/A
RUNWAY WIDTH AND LENGTH	3,502' X 75'	4,000' X 75'	2,800' X 150'	2,800 X 75'
RUNWAY SHOULDER WIDTH	10 FEET	SAME	10 FEET	SAME
RUNWAY END COORDINATES	16 - 47° 35' 51.05" N	16 - 47° 35' 55.85" N	5 - 47° 35' 40.10" N	SAME
	16 - 95° 46' 30.12" W	16 - 95° 46' 31.76" W	5 - 95° 46' 31.26" W	
	34 - 47° 35' 17.32" N	SAME	23 - 47° 35' 56.26" N	
	34- 95° 46' 18.99" W		23 - 95° 46' 58.11" W	
RUNWAY END ELEVATION	16 - 1266.3'	16 - 1264.4'	5 - 1267.0'	SAME
	34 - 1278.7'	SAME	23 - 1278.0'	
DISPLACED THRESHOLD COORDINATES	N/A	N/A	N/A	N/A
DISPLACED THRESHOLD ELEVATIONS	N/A	N/A	N/A	N/A
DISPLACED THRESHOLD ELEVATIONS	N/A	N/A	N/A	N/A
TOUCHDOWN ZONE ELEVATION	16 - 1276.6'	16 - 1274.2'	5 - 1278.0'	SAME
	34 - 1278.7'	SAME	23 - 1278.0'	
RUNWAY LIGHTING TYPE	MIRL	SAME	NONE	LIRL
RUNWAY MARKING TYPE	NON-PRECISION	SAME	NONE	NON-PRECISION
14 CFR PART 77 APPROACH CATEGORY	A(NP)	SAME	A(V)	A(NP)
14 CFR PART 77 APPROACH SLOPE	20:1	SAME	20:1	SAME
APPROACH VISIBILITY MINIMUMS	1 MILE	SAME	VISUAL	1 MILE
TYPE OF AERONAUTICAL SURVEY REQUIRED	NOT VERT GUIDED	SAME	N/A	NOT VERT GUIDED
THRESHOLD SITING SURFACE	TYPE 4	SAME	TYPE 2	TYPE 4
RUNWAY DEPARTURE SURFACE	YES	SAME	NO	YES
RUNWAY SAFETY AREA LENGTH BEYOND RWY END	300 FEET	SAME	240 FEET	300 FEET
RUNWAY SAFETY AREA WIDTH	150 FEET	SAME	120 FEET	150 FEET
RUNWAY OBJECT FREE AREA LEGNTH BEYOND RWY END	300 FEET	SAME	240 FEET	300 FEET
RUNWAY OBJECT FREE AREA WIDTH	500 FEET	SAME	250 FEET	500 FEET
RUNWAY PROTECTION ZONE DIMENSIONS	16 - 250' X 1,000' X 450'	SAME	5 - 250' X 1,000' X 450'	SAME
	34 - 250' X 1,000' X 450'		23 - 250' X 1,000' X 450'	
Mn/DOT CLEAR ZONE DIMENSIONS	16 - 500' X 1,000' X 700'	16 - 500' X 1,000' X 800'	5 - 250' X 1,200' X 490'	5 - 500' X 1,000' X 800'
	34 - 500' X 1,000' X 800'	SAME	23 - 250' X 1,200' X 490'	23 - 500' X 1,000' X 800'
OBSTACLE FREE ZONE LENGTH BEYOND RWY END	200 FEET	SAME	200 FEET	SAME
OBSTACLE FREE ZONE WIDTH	250 FEET	SAME	250 FEET	SAME
INNER APPROACH OBSTACLE FREE ZONE LENGTH	N/A	SAME	N/A	N/A
PRECISION OBSTACLE FREE ZONE DIMENSIONS	N/A	SAME	N/A	N/A
VISUAL AND INSTRUMENT NAVAIDS	GPS, PAPI, REIL, NDB, WIND CONE	GPS, PAPI, REIL, WIND CONE	NONE	GPS, PAPI, REIL
TAXIWAY DESIGN GROUP	TDG 2	SAME	N/A	N/A
PARALLEL-CONNECTOR TAXIWAY/TAXILANE WIDTH	35 FEET	SAME	N/A	N/A
TAXIWAY/LANE SAFETY AREA WIDTH	79 FEET	SAME	N/A	N/A
TAXIWAY OBJECT FREE AREA WIDTH	131 FEET	SAME	N/A	N/A
TAXILANE OBJECT FREE AREA WIDTH	115 FEET	SAME	N/A	N/A
TAXIWAY CL TO FIXED OR MOVEABLE OBJECT	65.5 FEET	SAME	N/A	N/A
TAXILANE CL TO FIXED OR MOVEABLE OBJECT	57.5 FEET	SAME	N/A	N/A
RUNWAY CL TO TAXIWAY CL SEPARATION	240 FEET	SAME	N/A	N/A
RUNWAY CL TO HOLDLINE SEPARATION	125 FEET	SAME	N/A	N/A
RUNWAY CL TO AIRCRAFT PARKING SEPARATION	250 FEET	SAME	N/A	N/A
TAXIWAY LIGHTING	REFLECTORS	MITL	N/A	N/A
VERTICAL AND HORIZONTAL DATUM	NAVD88 / NAD83	SAME	NAVD88 / NAD83	SAME
CRITICAL AIRCRAFT	KING AIR 200	SAME	AIR TRACTOR 302	KING AIR 200

- PAVEMENT STRENGTHS ARE EXPRESSED IN THOUSANDS OF POUNDS
- SINGLE (S), DUAL (D), DUAL TANDEM (DT), AND/OR DOUBLE DUAL TANDEM (DDT) WHEEL LOADING CAPACITIES- RATINGS ARE NOT PROVIDED FOR TURF RUNWAYS
- THRESHOLD SITING SURFACES BASED ON AC 150/5300-13A, CHANGE 1, TABLE 3-2

LEGEND	EXISTING	FUTURE	ULTIMATE
BEACON			
PAPI			
AIRPORT REFERENCE POINT			
WINDSOCK/ LIGHTED WINDSOCK			
RUNWAY THRESHOLD LIGHTS			
RUNWAY END IDENTIFIER LIGHTS (REILS)			
ROAD	PHOTO	NONE	NONE
PAVEMENT	PHOTO		
BUILDING	PHOTO		
RUNWAY PROTECTION ZONE			
OBJECT FREE AREA			
OBSTACLE FREE ZONE			
RUNWAY SAFETY AREA			
Mn/DOT CLEAR ZONE			
RUNWAY VISIBILITY ZONE			
BUILDING RESTRICTION LINE			
APPROACH SURFACE			
DEPARTURE SURFACE			
TAXIWAY OBJECT FREE AREA			
PROPERTY LINE			
EASEMENT		NONE	NONE
FENCE		NONE	NONE

2006 MAG DECLINATION: 3°04'E

0 150 300 600

THE ESTABLISHED BUILDING RESTRICTION LINE ACCOMODATES A 25' STRUCTURE.

NO PENETRATIONS TO EXISTING RUNWAY THRESHOLD SITING SURFACES EXIST.

GROUND CONTOURS OBTAINED FROM USGS DATA.

FAR PART 77 TRAVERSEWAY ADJUSTMENTS ARE APPLIED TO THE PUBLIC ROAD (15') AND RAILROAD (23') ELEVATIONS.

RUNWAY OFZ PENETRATIONS	
RWY 12-30	NONE
RWY 05-23	NONE

DECLARED DISTANCES		
ITEM	RUNWAY 16	RUNWAY 34
TAKEOFF RUN AVAILABLE (TORA)	3,502 FEET	3,502 FEET
TAKEOFF DISTANCE AVAILABLE (TODA)	3,502 FEET	3,502 FEET
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	3,502 FEET	3,502 FEET
LANDING DISTANCE AVAILABLE (LDA)	3,502 FEET	3,502 FEET

MODIFICATION OF STANDARDS						
NO.	DESCRIPTION	STANDARD	EXISTING	DISPOSITION	PROPOSED	APPROVED
1	NONE REQUIRED					
2						
3						
4						

Ulteig

Bismarck - Denver - Detroit Lakes - Fargo - Minneapolis - Sioux Falls
3350 38th Avenue South
Fargo, North Dakota 58104
Phone: 701.237.3211 Fax: 701.237.3191
Web: www.ulteig.com
Drawn By: RWK/CJL
Checked By: MRB
Approved By: JDS

AIRPORT LAYOUT DRAWING

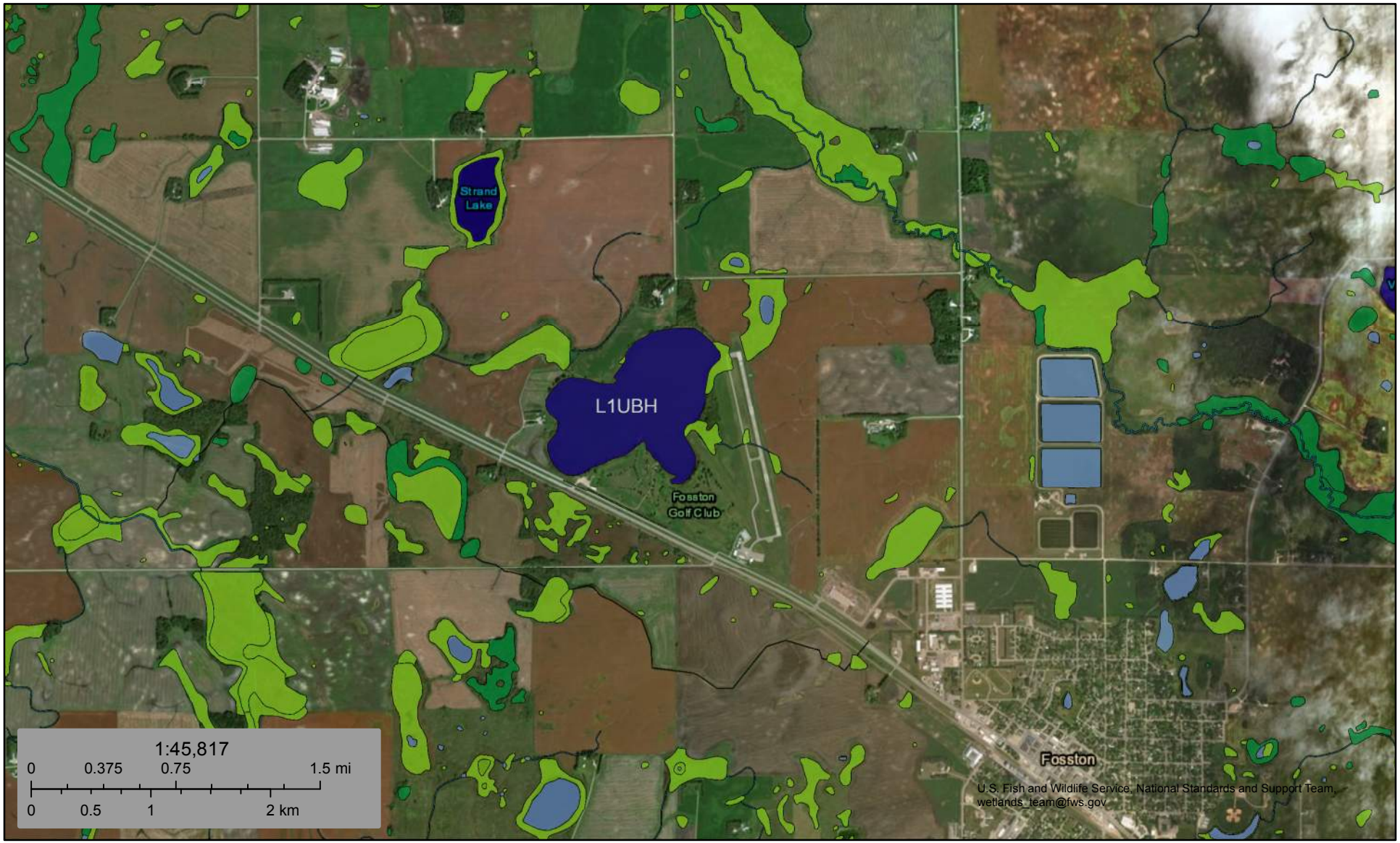
Project Number: 106.0221
Date: December 11, 2008
Sheets: 2 of 10

2

X:\3210700\180439.01\TECH\CAD\C2-FSE.ALD.06.dwg

U.S. Fish and Wildlife Service
National Wetlands Inventory

Fosston Municipal Airport



April 9, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix C: Cultural Resources

APE and 106 Finding

FEDERAL AVIATION ADMINISTRATION (FAA)
DOCUMENTATION OF SECTION 106 FINDING OF
NO HISTORIC PROPERTIES AFFECTED
SUBMITTED TO THE STATE HISTORIC PRESERVATION OFFICE (SHPO),
WHITE EARTH NATION TRIBAL HISTORIC PRESERVATION OFFICER (THPO),
TURTLE MOUNTAIN BAND OF CHIPPEWA THPO, & RED LAKE NATION
PURSUANT TO 36 CFR Section 800.4(d)(1) for the
FOSSTON MUNICIPAL AIRPORT
HANGAR SITE WORK & WILDLIFE HAZARDS PROJECT

1. DESCRIPTION OF THE UNDERTAKING

Utilizing Federal Aviation Administration (FAA) funding, Fosston Municipal Airport (Airport) has identified the need to modify existing landside and airside facilities in order to accommodate demand for hangar space, construction of hangars, improve aircraft circulation, pavement removal, install a wildlife fence, and mitigate existing wetland area wildlife hazards. Modifications will be performed in a manner that considers that the current aircraft tie down area and runup pad will eventually need to be relocated out of the departure surface (Appendix A).

2. AREA OF POTENTIAL EFFECT

The Area of Potential Effect (APE) is the area within which an undertaking may affect an historic property or cultural resource, either directly or indirectly. The APE for this project encompasses all areas proposed for disturbance and the view shed (the area which the project may visually impact) of the project (Appendix B).

3. EFFORTS TO IDENTIFY HISTORIC PROPERTIES

A SHPO records review did not identify any archeologic or historic properties for the proposed project area (Appendix C).

A 2008 Phase I Cultural Resources Survey (Appendix D) completed by UNDAR-West Anthropology Research for a parallel taxiway project has a review area that coincides with the current project. The ground surface was inspected for artifacts, features, and any other evidence of cultural resource sites. Subsurface probing was not conducted because subsurface visibility was judged sufficient (see previous section) to identify any archeological materials that might be present. Any cultural resources, which may have been in the project area, would have had a visible surface expression, given the effects of agricultural plowing. No resulting cultural resources were discovered during this survey.

The FAA Environmental Protection Specialist access the OSA Portal on 20-November 2019. A lithic scatter was found approximately ten miles from the project area. A site called Bunker Hill was identified greater than one mile from the project site, but no details were provided about this site. No other sites were within close proximity of the airport.

4. BASIS FOR FINDING

The Airport has been subject to repeated earth moving activities and no cultural resources were discovered. If any construction activity results in the advertent discovery of a cultural resource, construction will halt until the SHPO, THPOs, and the FAA are notified. A discovery plan will then be implemented by the FAA to work with the inadvertent discovery.

Completion of the Phase I Cultural Resources Survey did not identify any impacts to any National Register listed or eligible-for-listing resources due to the proposed project. The FAA has therefore determined that a finding of *No Historic Properties Affected* is appropriate for this project. The FAA respectfully requests that White Earth Nation, Turtle Mountain Band of Chippewa THPOs, Red Lake Nation, and the SHPO provide written concurrence within 30 days of receipt of this Section 106 finding of No Historic Properties Affected.

ATTACHMENTS

Appendix A: Project Exhibit

Appendix B: APE Map

Appendix C: SHPO Records Review

Appendix D: Phase I Cultural Resources Survey

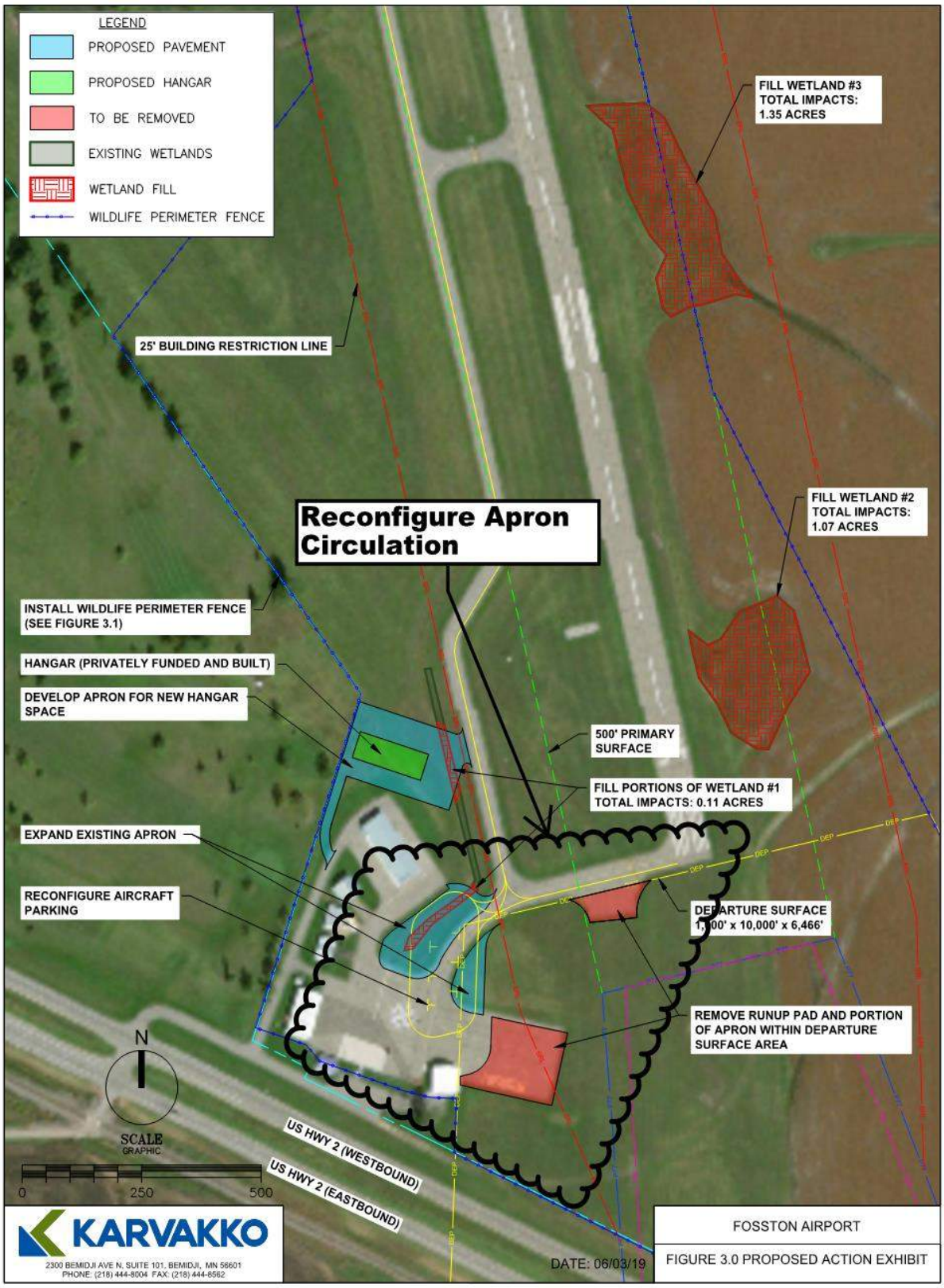
Josh Fitzpatrick
Environmental Protection Specialist
Federal Aviation Administration
Dakota-Minnesota Airport District Office

20-November 2019

Date

Appendix A

Proposed Action Exhibt



Appendix B

Ouff Lake
Fosston Airport Project APE in red
34
© 2018 Google
Google Earth
1991
Imagery Date: 4/14/2015 47°35'25.87" N 95°46'19.68" W elev 1275 ft eye alt

Appendix C

From:	Keith Kinnen
To:	Fitzpatrick, Joshua (FAA)
Cc:	Mike Karvakko
Subject:	FW: Records review data request
Date:	Friday, November 15, 2019 9:53:04 AM
Attachments:	image002.png image001.png image007.png image008.png image009.png

---

Josh,
Below is my response from SHPO.
There are no historic records in the area.

I am still waiting to hear back from DNR regarding NHIS request.

Thank you,

Keith E. Kinnen, PLA
Landscape Architect + Environmental Specialist

Karvakko, P.A.
O: (218) 444-8004
M: (218) 841-3755
www.karvakko.com

From: MN_MNIT_Data Request SHPO [mailto:DataRequestSHPO@state.mn.us]
Sent: Friday, November 15, 2019 9:28 AM
To: Keith Kinnen <Keith.Kinnen@karvakko.com>
Subject: RE: Records review data request

Hello Keith,

Our database has no archaeologic or historic records for the given area.

Jim

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

SHPO Data Requests
Minnesota State Historic Preservation Office
50 Sherburne Avenue, Suite 203
Saint Paul, MN 55155
(651) 201-3299
datarequestshpo@state.mn.us

Notice: This email message simply reports the results of the cultural resources database search you requested. The database search is only for previously known archaeological sites and historic properties. **IN NO CASE DOES THIS DATABASE SEARCH OR EMAIL MESSAGE CONSTITUTE A PROJECT REVIEW UNDER STATE OR FEDERAL PRESERVATION LAWS –** please see our website at https://mn.gov/admin/shpo/protection/ for further information regarding our Environmental Review Process.

Because the majority of archaeological sites in the state and many historic/architectural properties have not been recorded, important sites or properties may exist within the search area and may be affected by development projects within that area. Additional research, including field surveys, may be necessary to adequately assess the area's potential to contain historic properties or archaeological sites.

Properties that are listed in the National Register of Historic Places (NRHP) or have been determined eligible for listing in the NRHP are indicated on the reports you have received, if any. The following codes may be on those reports:

NR – National Register listed. The properties may be individually listed or may be within the boundaries of a National Register District.

CEF – Considered Eligible Findings are made when a federal agency has recommended that a property is eligible for listing in the National Register and MN SHPO has accepted the recommendation for the purposes of the Environmental Review Process. These properties need to be further assessed before they are officially listed in the National Register.

SEF – Staff eligible Findings are those properties the MN SHPO staff considers eligible for listing in the National Register, in circumstances other than the Environmental Review Process.

DOE – Determination of Eligibility is made by the National Park Service and are those properties that are eligible for listing in the National Register, but have not been officially listed.

CNEF – Considered Not Eligible Findings are made during the course of the Environmental Review Process. For the purposes of the review a property is considered not eligible for listing in the National Register. These properties may need to be reassessed for eligibility under additional or alternate contexts.

Properties without NR, CEF, SEF, DOE, or CNEF designations in the reports may not have been evaluated and therefore no assumption to their eligibility can be made. Integrity and contexts change over time, therefore any eligibility determination made ten (10) or more years from the date of the current survey are considered out of date and the property will need to be reassessed.

If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic/architectural properties, you may need to hire a qualified archaeologist and/or historian. If you need assistance with a project review, please contact Kelly Gragg-Johnson, Environmental Review Specialist @ 651-201-3285 or by email at kelly.graggjohnson@state.mn.us.

The Minnesota SHPO Archaeology and Historic/Architectural Survey Manuals can be found at https://mn.gov/admin/shpo/identification-evaluation/.

MN SHPO research hours are **8:30 AM – 4:00 PM Tuesday-Friday**.

PLEASE NOTE: We strongly encourage you to email datarequestshpo@state.mn.us or call ahead at 651-201-3299 or 651-201-3287 to schedule the time you wish to visit our office. Starting Tuesday, September 24th, 2019, our building security protocol will change so that you will be required to check in at the building lobby security desk to receive a temporary pass to our office if you have scheduled your visit ahead of time. If you have not scheduled your visit ahead of time a SHPO staff member will have to escort you to and from our office which, of course, will be more inconvenient for everyone. Thank you.

SHPO needs your input! Help create Minnesota's next statewide preservation plan by *taking a brief survey.*

Planning a visit to access SHPO's files? Learn about security changes and *how to arrange a visit.*

From: Keith Kinnen <Keith.Kinnen@karvakko.com>
Sent: Thursday, November 14, 2019 9:43 AM
To: MN_MNIT_Data Request SHPO <DataRequestSHPO@state.mn.us>
Subject: Records review data request

Please send available records for the following:

Fosston Municipal Airport
SE1/4 S32, T148, R40

Thank you

Keith E. Kinnen, PLA
Landscape Architect + Environmental Specialist

Karvakko, P.A.
O: (218) 444-8004
M: (218) 841-3755
www.karvakko.com

Appendix D

FOSSTON MUNICIPAL AIRPORT
2008 PHASE I CULTURAL RESOURCES SURVEY
POLK COUNTY, MINNESOTA

by

Michael A. Jackson

UNDAR-West
Anthropology Research
Department of Anthropology
University of North Dakota
Grand Forks ND 58202-7094

Project UW#2536

Report prepared for and submitted to

Ulteig Engineers, Inc.
3350 38th Avenue South
Fargo ND 58104

January 2009

Anthropology Research/UNDAR-West Report
Department of Anthropology—University of North Dakota

NEGATIVE SURVEY REPORT FORM

REPORT TITLE: Fosston Municipal Airport 2008 Phase I Cultural Resources Survey, Polk County, Minnesota.

AUTHOR(s): Michael A. Jackson

REPORT DATE: 01-23-2009 **SURVEY DATE:** 11-11-2008	**ACREAGE OR DIMENSIONS OF SURVEY:** 10 acres. **PROJECT SPONSOR:** Ulteig Engineers, Inc., on behalf of the city of Fosston, MN.

ARCHEOLOGICAL RESOURCE REGION: Central Lakes Coniferous.

LEGAL DESCRIPTION (County, Twp, R, Section, 1/4): Polk County, MN; T148N, R40W, SCT 32, E½.

DESCRIPTION OF UNDERTAKING/PROPOSED ACTIVITY:

The City of Fosston, Polk County, MN, intends to construct a new taxiway to the west of the existing runway at the Fosston Municipal Airport (Figures 1 and 2). The project area is within the existing bounds of the city airport, located at the northwest edge of the city. The proposed project corridor for the new taxiway measures about 3500-x-125-ft. In addition, five small wetlands bordering the runway and taxiway will be infilled, to reduce the number of wild animals in the immediate vicinity of the runway and proposed taxiway.

RESULTS OF LITERATURE SEARCH: __X__ Negative or:

FIELD PERSONNEL (Identify PI, # & Names of Field Staff): Michael A. Jackson, M.A., Principal Investigator, and Dr. Dennis L. Toom, Ph.D.

SURVEY CONDITIONS (% Visible Ground, Type of Cover, erosion or other disturbance, Snow/Ice):

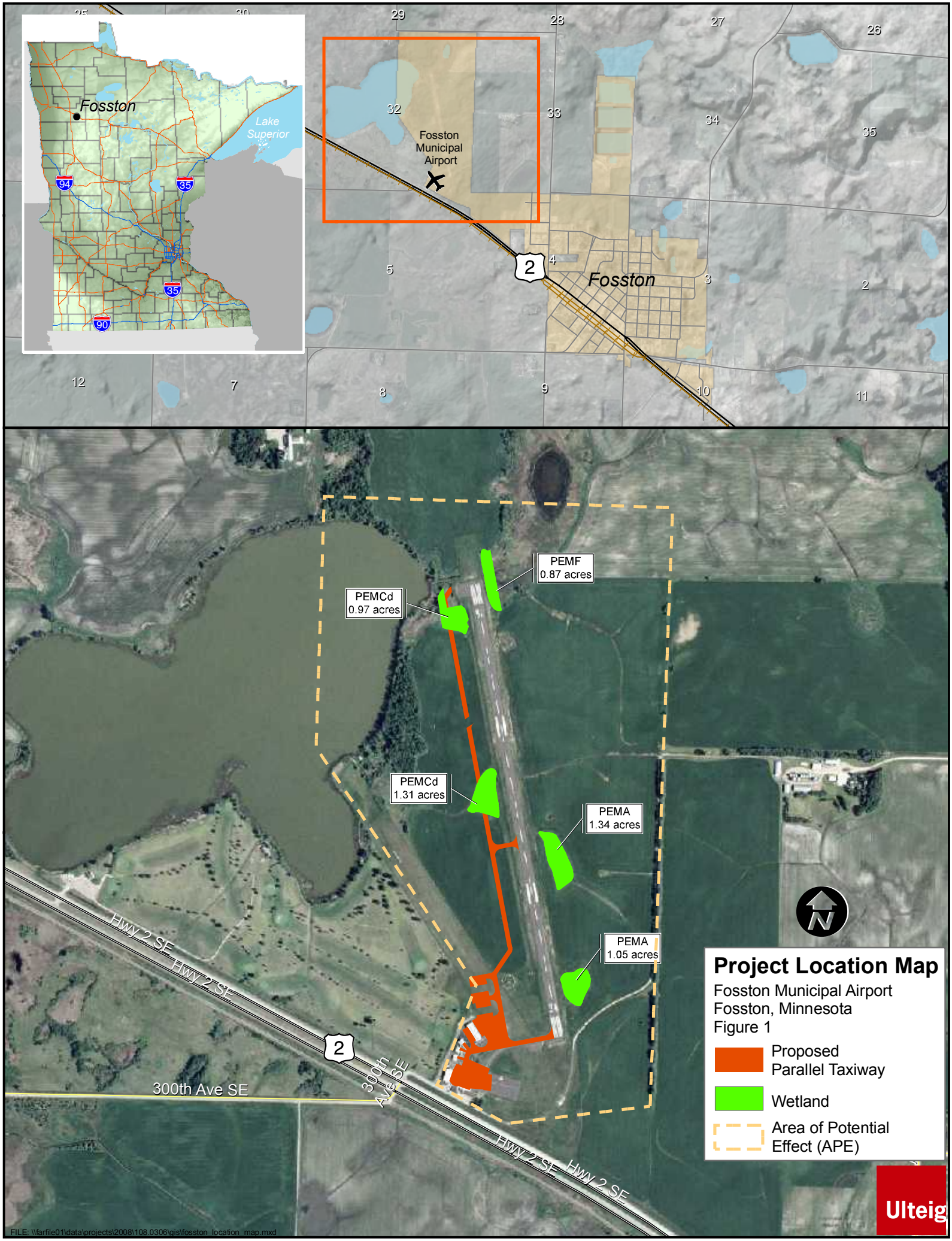
The project area is located in gently rolling, glacial till terrain northwest of the city of Fosston. Ouff Lake, a permanent and natural lake, is located to the west and north of the project area (Figures 1 and 2). The project area contains generally clay-rich sediments. About 80-90% of the project area was located in an agricultural field that adjoins the existing runway. The field had been recently disked, which created excellent ground surface visibility. The southernmost part of the project area adjoins and overlaps existing facilities (hangers, buildings, parking lots, and paved roads) within the airport headquarters. A grass lawn was present in this southern area, and subsurface visibility was consequently poor. Overall, ground surface visibility was excellent in the project area (Figure 3).

Weather conditions during the survey consisted of overcast skies, cold temperatures, gentle breezes, and intermittent snow/sleet/rain drizzle. The conditions did not impede the conduct of the survey.

SURVEY METHODS (Transect Spacing, Person Hours, Subsurface Investigations):

Two pedestrian transects were walked along the length of proposed taxiway. The edges of the five wetlands were also examined. The ground surface was inspected for artifacts, features, and any other evidence of cultural resource sites. Subsurface probing was not conducted because subsurface visibility was judged sufficient (see previous section) to identify any archeological materials that might be present. Any cultural resources, which may have been in the project area, would have had a visible surface expression, given the effects of agricultural plowing. Two person-hours were spent surveying the project right-of-way.

NEGATIVE SURVEY REPORT FORM	
SURVEY RESULTS: __X__ No Cultural Material	**RECOMMENDATIONS**: __X__ No Further Work
REFERENCES CITED: None.	


Fosston
Lake Superior
94
35
35
90
29
28
27
26
32
33
34
35
Fosston Municipal Airport
2
4
5
3
2
Fosston
12
7
8
9
10
11
PEMF
0.87 acres
PEMCd
0.97 acres
PEMCd
1.31 acres
PEMA
1.34 acres
PEMA
1.05 acres
Hwy 2 SE
Hwy 2 SE
2
300th Ave SE
300th Ave SE
Hwy 2 SE
Hwy 2 SE
N
Project Location Map
Fosston Municipal Airport
Fosston, Minnesota
Figure 1
Proposed Parallel Taxiway
Wetland
Area of Potential Effect (APE)
Ulteig
FILE: \\farfile01\data\projects\2008\108.0306\gis\fosston_location_map.mxd

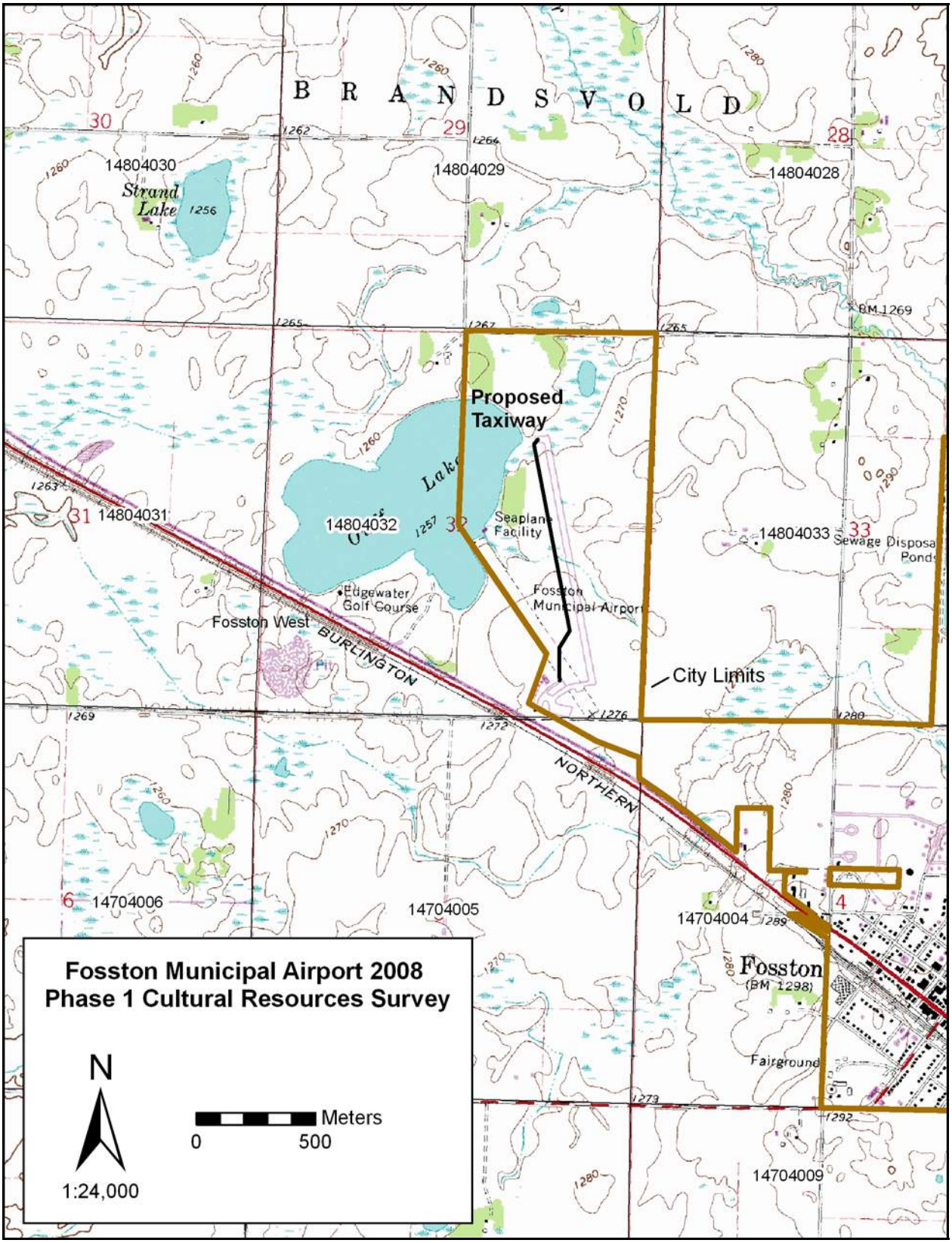


Figure 2. Fosston Municipal Airport survey area plotted on the 7.5' USGS quadrangle Fosston West, MN.

Figure 3. Overview photograph of the Fosston Municipal Airport project area, view north-northwest (UW2536-DP1).

Keith Kinnen

THPO Coordination

From: Fitzpatrick, Joshua (FAA) <Joshua.Fitzpatrick@faa.gov>
Sent: Wednesday, November 20, 2019 3:54 PM
To: Keith Kinnen
Subject: FW: Determination of Effect for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project
Attachments: 106 Finding.pdf

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

From: Fitzpatrick, Joshua (FAA)
Sent: Wednesday, November 20, 2019 3:52 PM
To: jaime.arsenault@whiteearth.com
Cc: Jaime Arsenault (jaime.arsenault@whiteearth-nsn.gov) <jaime.arsenault@whiteearth-nsn.gov>
Subject: Determination of Effect for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project

Dear Ms. Arsenault:

The Federal Aviation Administration (FAA) determined that a Section 106 finding of a No Historic Properties Affected is applicable for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project. The FAA respectfully requests the White Earth Nation Tribal Historic Preservation Office (THPO) to provide written concurrence with the Section 106 determination of No Historic Properties Affected within 30 days of receipt.

If you prefer to have monitors at construction or if you have any comments, questions, or concerns regarding the analyses and conclusions used to determine the potential effects of the proposed project on historic, cultural, and archaeological resources, or have any questions regarding the project, please do not hesitate to contact me.

Sincerely,

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

Keith Kinnen

From: Fitzpatrick, Joshua (FAA) <Joshua.Fitzpatrick@faa.gov>
Sent: Wednesday, November 20, 2019 3:53 PM
To: Keith Kinnen
Subject: FW: Determination of Effect for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project
Attachments: 106 Finding.pdf

Keith,

I sent the attached 106 finding to SHPO today. Please reference this finding and the coordination with the SHPO and THPO below and THPO other emails I will forward to you in the EA.

Thank you,

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

From: Fitzpatrick, Joshua (FAA)
Sent: Wednesday, November 20, 2019 3:49 PM
To: kadeferris1@gmail.com
Subject: Determination of Effect for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project

Dear Mr. Ferris:

The Federal Aviation Administration (FAA) determined that a Section 106 finding of a No Historic Properties Affected is applicable for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project. The FAA respectfully requests the Red Lake Nation to provide written concurrence with the Section 106 determination of No Historic Properties Affected within 30 days of receipt.

If you prefer to have monitors at construction or if you have any comments, questions, or concerns regarding the analyses and conclusions used to determine the potential effects of the proposed project on historic, cultural, and archaeological resources, or have any questions regarding the project, please do not hesitate to contact me.

Sincerely,

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

Keith Kinnen

From: Fitzpatrick, Joshua (FAA) <Joshua.Fitzpatrick@faa.gov>
Sent: Wednesday, November 20, 2019 3:54 PM
To: Keith Kinnen
Subject: FW: Determination of Effect for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project
Attachments: 106 Finding.pdf

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

From: Fitzpatrick, Joshua (FAA)
Sent: Wednesday, November 20, 2019 3:51 PM
To: desjarlaisjr.jeffrey@yahoo.com
Subject: Determination of Effect for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project

Dear Mr. Desjarlais:

The Federal Aviation Administration (FAA) determined that a Section 106 finding of a No Historic Properties Affected is applicable for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project. The FAA respectfully requests the Turtle Mountain Band of Chippewa Tribal Historic Preservation Office (THPO) to provide written concurrence with the Section 106 determination of No Historic Properties Affected within 30 days of receipt.

If you prefer to have monitors at construction or if you have any comments, questions, or concerns regarding the analyses and conclusions used to determine the potential effects of the proposed project on historic, cultural, and archaeological resources, or have any questions regarding the project, please do not hesitate to contact me.

Sincerely,

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

Keith Kinnen

SHPO Coordination

From: MN_MNIT_Data Request SHPO <DataRequestSHPO@state.mn.us>
Sent: Friday, November 15, 2019 9:28 AM
To: Keith Kinnen
Subject: RE: Records review data request

Hello Keith,

Our database has no archaeologic or historic records for the given area.

Jim

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

SHPO Data Requests
Minnesota State Historic Preservation Office
50 Sherburne Avenue, Suite 203
Saint Paul, MN 55155
(651) 201-3299
datarequestshpo@state.mn.us

Notice: This email message simply reports the results of the cultural resources database search you requested. The database search is only for previously known archaeological sites and historic properties. **IN NO CASE DOES THIS DATABASE SEARCH OR EMAIL MESSAGE CONSTITUTE A PROJECT REVIEW UNDER STATE OR FEDERAL PRESERVATION LAWS –** please see our website at https://mn.gov/admin/shpo/protection/ for further information regarding our Environmental Review Process.
Because the majority of archaeological sites in the state and many historic/architectural properties have not been recorded, important sites or properties may exist within the search area and may be affected by development projects within that area. Additional research, including field surveys, may be necessary to adequately assess the area's potential to contain historic properties or archaeological sites.
Properties that are listed in the National Register of Historic Places (NRHP) or have been determined eligible for listing in the NRHP are indicated on the reports you have received, if any. The following codes may be on those reports:
NR – National Register listed. The properties may be individually listed or may be within the boundaries of a National Register District.
CEF – Considered Eligible Findings are made when a federal agency has recommended that a property is eligible for listing in the National Register and MN SHPO has accepted the recommendation for the purposes of the Environmental Review Process. These properties need to be further assessed before they are officially listed in the National Register.
SEF – Staff eligible Findings are those properties the MN SHPO staff considers eligible for listing in the National Register, in circumstances other than the Environmental Review Process.
DOE – Determination of Eligibility is made by the National Park Service and are those properties that are eligible for listing in the National Register, but have not been officially listed.
CNEF – Considered Not Eligible Findings are made during the course of the Environmental Review Process. For the purposes of the review a property is considered not eligible for listing in the National Register. These properties may need to be reassessed for eligibility under additional or alternate contexts.
Properties without NR, CEF, SEF, DOE, or CNEF designations in the reports may not have been evaluated and therefore no assumption to their eligibility can be made. Integrity and contexts change over time, therefore any eligibility determination made ten (10) or more years from the date of the current survey are considered out of date and the property will need to be reassessed.
If you require a comprehensive assessment of a project's potential to impact archaeological sites or historic/architectural properties, you may need to hire a qualified archaeologist and/or historian. If you need assistance with a project review, please contact Kelly Gragg-Johnson, Environmental Review Specialist @ 651-201-3285 or by email at kelly.graggjohnson@state.mn.us.
The Minnesota SHPO Archaeology and Historic/Architectural Survey Manuals can be found at https://mn.gov/admin/shpo/identification-evaluation/.

MN SHPO research hours are **8:30 AM – 4:00 PM Tuesday-Friday**.

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From: Keith Kinnen <Keith.Kinnen@karvakko.com>
Sent: Thursday, November 14, 2019 9:43 AM
To: MN_MNIT_Data Request SHPO <DataRequestSHPO@state.mn.us>
Subject: Records review data request

Please send available records for the following:

Fosston Municipal Airport
SE1/4 S32, T148, R40

Thank you

Keith E. Kinnen, PLA
Landscape Architect + Environmental Specialist

Karvakko, P.A.
O: (218) 444-8004

Keith Kinnen

From: Fitzpatrick, Joshua (FAA) <Joshua.Fitzpatrick@faa.gov>
Sent: Wednesday, February 19, 2020 12:48 PM
To: Keith Kinnen
Subject: FW: Fosston Municipal Airport Hangar Site Work; SHPO No. 2020-0479
Attachments: Fosston Building Inventory.pdf

Keith,

Please ensure this email is referenced in the Fosston EA as well as in the appendix. Please capture the entire conversation and coordination efforts.

Thanks,

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

From: Fitzpatrick, Joshua (FAA)
Sent: Tuesday, January 21, 2020 1:38 PM
To: GraggJohnson, Kelly (ADM) <kelly.graggjohnson@state.mn.us>
Subject: RE: Fosston Municipal Airport Hangar Site Work; SHPO No. 2020-0479

Hi Kelly:

Per our previous conversation and your email below, since the buildings at Fosston were constructed in the 1970s I had our consultant go take pictures and provide a narrative for each building. Unfortunately, some of the buildings are private hangars and they were not granted entry for interior photos. At present, there is nothing that would meet NRHP criteria for these buildings. I still maintain a No Historic Properties Affected determination based on the attached information. Please let me know your thoughts and if this suffices. If not, we will have to get someone under contract and may have to delay until summer, but not sure.

Thank you for your assistance.

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

From: GraggJohnson, Kelly (ADM) <kelly.graggjohnson@state.mn.us>
Sent: Monday, December 16, 2019 4:22 PM
To: Fitzpatrick, Joshua (FAA) <Joshua.Fitzpatrick@faa.gov>
Subject: Fosston Municipal Airport Hangar Site Work; SHPO No. 2020-0479

Hi Josh –

I was reviewing your consultation letter for this project and the "Cultural Resources Survey" report (2009) that was completed for this project and noted that there is no mention of history/architecture properties being surveyed within the APE. I see that a SHPO records search was done with negative results – but the survey report only references archaeological survey and there is no mention of any properties/buildings being surveyed within the APE. From the maps provided, it appears that there are some buildings – hangars? Offices - Not sure what these are or when they may have been built - but we should have and idea of what is out there and if the FAA has ever addressed the question of the airport's eligibility for listing in the National Register of Historic Places. Please submit further information regarding the Fosston Airport, the buildings/structures located at the airport, dates of construction, etc. FAA should be taking into account the project's effects on all historic properties – not just archaeological resources.

Thanks. Please feel free to contact me with any questions regarding our review of this project.

Best,

Kelly

DEPARTMENT OF ADMINISTRATION
STATE HISTORIC PRESERVATION OFFICE

Kelly Gragg-Johnson | Environmental Review Specialist
50 Sherburne Avenue, Suite 203
Saint Paul, MN 55155
(651) 201-3285
kelly.graggjohnson@state.mn.us

SHPO needs your input! Help create Minnesota's next statewide preservation plan by *taking a brief survey.*

Planning a visit to access SHPO's files? Learn about security changes and *how to arrange a visit.*

Keith Kinnen

White Earth THPO Concurrence

From: Fitzpatrick, Joshua (FAA) <Joshua.Fitzpatrick@faa.gov>
Sent: Monday, January 27, 2020 7:59 AM
To: Keith Kinnen
Subject: FW: Determination of Effect for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project

Keith,

Below is the White Earth THPO's concurrence to be included in the Fosston appendices and date and concurrence referenced in Fosston draft EA text.

Thank you,

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

From: Jaime Arsenault <Jaime.Arsenault@whiteearth-nsn.gov>
Sent: Sunday, January 26, 2020 11:45 PM
To: Fitzpatrick, Joshua (FAA) <Joshua.Fitzpatrick@faa.gov>
Subject: Re: Determination of Effect for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project

Dear Mr. Fitzpatrick,

Thank you for providing this office with information regarding Polk County, MN: T148N, R40W, SCT 32, E 1/2, pursuant to Section 106 of the National Historic Preservation Act, and its implementing regulation 36 CFR part 800.

Based upon a preliminary inquiry, there are no known cultural resources in this area. This determination is based upon available information provided to this office. However, this review does not preclude the possibility of previously unknown cultural resources. If cultural materials are uncovered in the course of construction, all work must cease and the Tribal Historic Preservation Office must be contacted immediately.

Thank you again for providing our office with this information. Please contact me with any questions regarding this correspondence.

Sincerely,

Jaime Arsenault
Tribal Historic Preservation Officer
PO Box 418
White Earth, MN 56569
Office: (218) 983-3285 Ext. 5807
Cell: (218) 850-0652

E-mail: Jaime.arsenault@whiteearth-nsn.gov

From: Fitzpatrick, Joshua (FAA) <Joshua.Fitzpatrick@faa.gov>
Sent: Wednesday, November 20, 2019 3:51 PM
To: jaime.arsenault@whiteearth.com <jaime.arsenault@whiteearth.com>
Cc: Jaime Arsenault <Jaime.Arsenault@whiteearth-nsn.gov>
Subject: Determination of Effect for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project

Dear Ms. Arsenault:

The Federal Aviation Administration (FAA) determined that a Section 106 finding of a No Historic Properties Affected is applicable for the Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project. The FAA respectfully requests the White Earth Nation Tribal Historic Preservation Office (THPO) to provide written concurrence with the Section 106 determination of No Historic Properties Affected within 30 days of receipt.

If you prefer to have monitors at construction or if you have any comments, questions, or concerns regarding the analyses and conclusions used to determine the potential effects of the proposed project on historic, cultural, and archaeological resources, or have any questions regarding the project, please do not hesitate to contact me.

Sincerely,

Josh Fitzpatrick
Environmental Protection Specialist
FAA Dakota-Minnesota Airport District Office
Joshua.Fitzpatrick@faa.gov
(612) 253-4639

SHPO Concurrence

February 19, 2020

Mr. Josh Fitzpatrick
Environmental Protection Specialist
Federal Aviation Administration
Dakota –Minnesota Airports District Office
6020 28th Avenue South, Room 102
Minneapolis, MN 55450

RE: Fosston Municipal Airport Hangar Site Work and Wildlife Hazard Project
T148 R40 S32 SE, Fosston, Polk County
SHPO Number: 2020-0479

Dear Mr. Fitzpatrick:

Thank you for initiating consultation on the above project. Information received in our office on November 25, 2019 and January 21, 2020 has been reviewed pursuant to the responsibilities given the State Historic Preservation Officer by Section 106 of the National Historic Preservation Act of 1966 and implementing federal regulations at 36 CFR 800.

Define Undertaking and Area of Potential Effects
According to your submittal, the Federal Aviation Administration is funding a project that is proposing to modify existing landside and airside facilities in order to accommodate the demand for additional hangar space, the construction of new hangars, the improvement of aircraft circulation, the removal of pavement, the installation of a wildlife fence and the mitigation of existing wetland area wildlife hazards. We have completed our review of the documentation provided in regards to your agency's determination of the area of potential effect (APE) for the Federal undertaking. We agree that this APE determination is generally appropriate to take into account the potential direct and indirect effects of the proposed undertaking as we currently understand it. As the project's scope of work is further defined, or if it is significantly altered from the current scope, additional consultation with our office may be necessary in order to revise the current APE.

Identification of Historic Properties
Archaeological Resources
We have reviewed the submitted documentation including the report titled *Fosston Municipal Airport, 2008 Phase I Cultural Resources Survey, Polk County, Minnesota* (January 2009) as prepared by the University of North Dakota Department of Anthropology. Based on the results of the investigations, we agree that no known or suspected archaeological sites will be affected by the project and that no further archaeological survey is warranted for the project as it is currently proposed.

History/Architecture Properties
We have reviewed the information included with your November 20, 2019 submittal, as well as the additional documentation you submitted via email on January 21, 2020, and based on the information provided, we have determined that no intensive level survey of the airport properties is warranted.

Assessment of Effects
Based on information that is available to us at this time, we concur with your agency's determination that **no historic properties will be affected** by the project as it is currently defined.

Implementation of the undertaking in accordance with this finding, as documented, fulfills your agency's responsibilities under Section 106. If the project is not implemented as proposed, including, but not limited to, a situation where design changes to the currently proposed project diverts substantially from what was presented at the time of this review, then your agency will need to reopen Section 106 consultation with our office pursuant to 36 CFR 800.5(d)(1).

Please contact Kelly Gragg-Johnson, Environmental Review Specialist, at (651) 201-3285 or kelly.graggjohnson@state.mn.us if you have any questions regarding our review of this project.

Sincerely,

Sarah J. Beimers

Sarah J. Beimers
Environmental Review Program Manager

Building Inventory

Fosston Municipal Airport
Building Inventory
January 2020

Introduction:
As part of the ongoing Environmental Assessment for the Fosston Municipal Airport, SHPO requested a building inventory be completed for the property. Following is the inventory.

Overview:
A total of 7 buildings exist on the property. Buildings consist of a SRE building, Arrival/Departure Building, 4 private hangars, and a small shed. Because the hangars are privately owned, access to the inside of the buildings was limited. However, records indicate each of the buildings were constructed in the 1970's and exterior photos were gathered for the inventory.

Building #1: Snow Removal Equipment (SRE) Building.
Polk County building records show this building was constructed in 2007. Dimensions of the building measure approximately 47' x 52'. Material of the building is primarily ribbed steel panels on wood framework with concrete foundation. Utilities include water and electric.

Building #2: Arrival/Departure Building.
Polk County has no building records of this building, but the building was likely constructed in the 1970's with the other buildings on site. Dimensions of the building measure 28' x 36'. Material of the building is primarily ribbed steel panels on the roof with vinyl siding. Framework is wood with concrete foundation. Utilities include water, sewer, and electric.

Building #3: Private Hangar.
Polk County building records show this building was constructed in 1977. Dimensions of the building measure approximately 48' x 88'. Material of the building is primarily ribbed steel panels on the sides with corrugated steel on the roof. Framework is wood and the foundation is concrete. Utilities include water, electric, and gas.

Building #4: Electrical Control Shed.
Polk County has no building records of this building, but the Public Works Director believes the building was constructed in the 2000's. Dimensions of the building measure 10' x 12'. Material of the building is ribbed steel panels on the roof with 6" steel siding. Framework is wood with concrete foundation. Utilities include electric.

Building #5: Private Hangar.
Polk County building records show this building was constructed in 1970. Dimensions of the building measure approximately 30' x 42'. Material of the building is primarily ribbed steel panels on the sides and roof. Framework is wood and the foundation is concrete. Utilities include electric.

Building #6: Private Hangar.
Polk County building records show this building was constructed in 1973. Dimensions of the building measure approximately 40' x 40'. Material of the building is primarily corrugated steel panels on the sides and roof. Framework is wood and the foundation is concrete. Utilities include electric.

Building #7: Private Hangar.

Polk County building records show this building was constructed in 1976. Dimensions of the building measure approximately 52’ x 143’. Material of the building is primarily ribbed steel panels on the sides and roof. Framework is wood and the foundation is concrete. Utilities include electric.

Photos:

Photo 1: Building #1 from NW

Photo 2: Building #1 from NE

Photo 3: Building #1 from SW

Photo 4: Building #1 Inside, SW corner

Photo 5: Building #1 Inside, NW corner

Photo 6: Building #2 from SE

Photo 7: Building #2 from SW

Photo 8: Building #2, Inside

Photo 9: Building #2, Inside

Photo 10: Building #2, Inside

Photo 11: Building #2, Inside

Photo 12: Building #3, from SW

Photo 13: Building #3, from NE

Photo 14: Building #4, from SW

Photo 15: Building #4, from NW

Photo 16: Building #5, from SW

Photo 17: Building #5, from SE

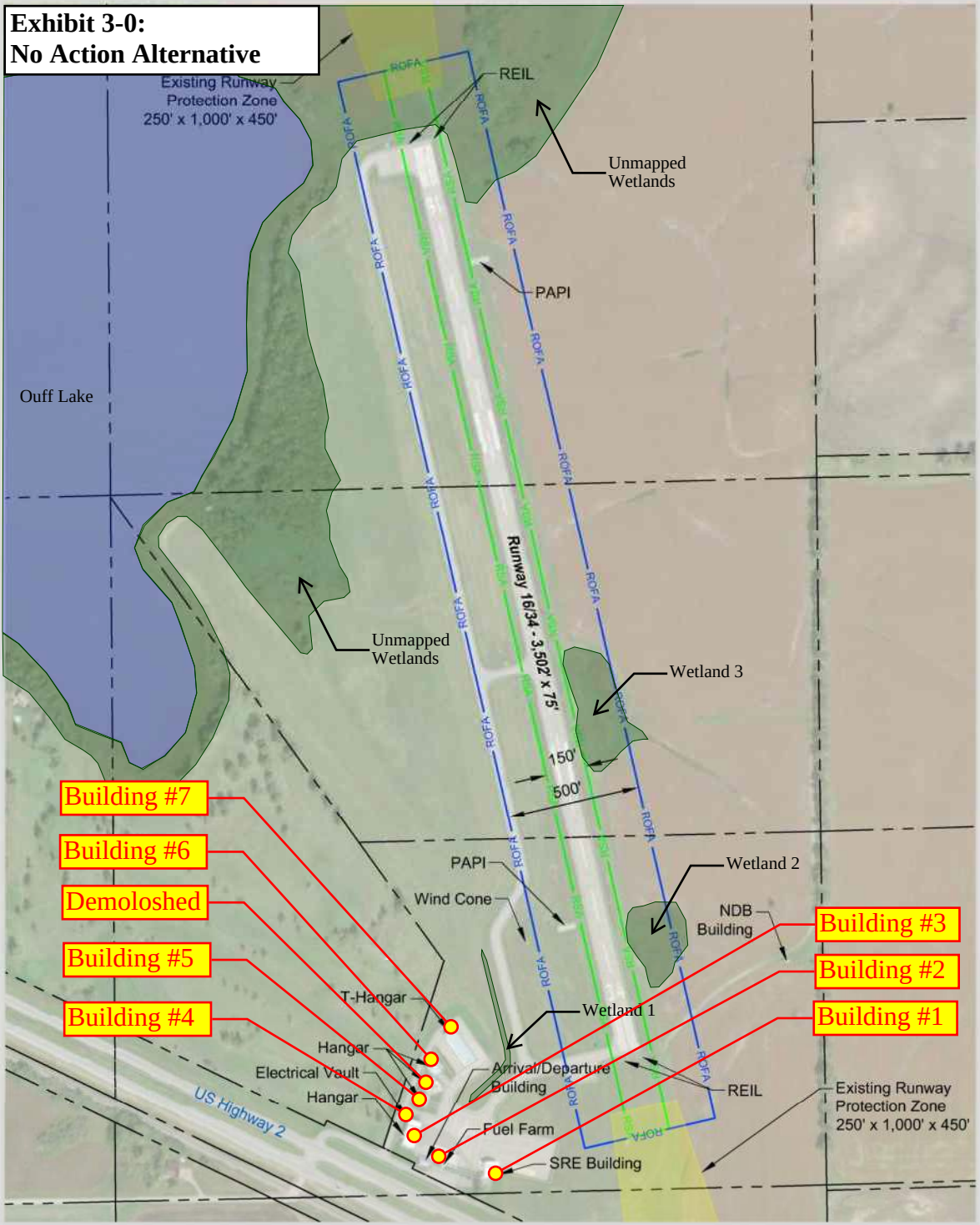
Photo 18: Building #6, from SE

Photo 19: Building #6, from NW

Photo 20: Building #7, from NW

Photo 21: Building #7, from SE

Exhibit 3-0:
No Action Alternative



Appendix D: Other Items

Triggering Event Narrative Report

1 Chapter One: Inventory

1.1 Introduction

The purpose of the inventory chapter of this Triggering Event Narrative Report for the Fosston Municipal Airport (FSE) is to establish the existing conditions, describe the surrounding community, and identify the primary functions of the Airport. Established existing conditions will be compared to anticipated demand to determine the best way to adapt airport facilities to meet demand. This report is tailored to assist the Airport meet its specific needs to best serve the aviation and local communities. The focal point of this report is the landside infrastructure, with the goal of supporting aviation and business growth. However, as few activities on an Airport happen in isolation this chapter also assesses the Airport in general. This approach, providing of overview of the Airport while focusing on impacts to landside infrastructure, will be used throughout this report. Airport facilities are discussed in the following sections:

- Airport Background
- Airside Facilities
- Landside Facilities
- Demographic and Socioeconomic Trends
- Summary

1.2 Airport Background

The development of airports is often guided by relevant regulations and planning documents at the local, state, and federal government levels. This section provides a summary of background information relevant to the Airport.

1.2.1 Airport Location and History

The Fosston Municipal Airport is located on 308 acres approximately 1 mile northwest of the Fosston city center along US Highway 2. Initially established during the World War II era, the Airport has seen periods of growth throughout the years. The City has managed the Airport since 1946 and during that time it has experienced varied development. This includes the addition of runway lighting in 1959, a runway extension in the 1970s, and a new Snow Removal Equipment (SRE) building constructed in 2009. The Bemidji Regional Airport (BJI) offers the closest commercial air carrier service while FSE provides a connection to the city and surrounding areas for General Aviation (GA) users.

1.2.2 State Aviation System Plan

The Minnesota State Aviation System Plan (SASP) is a statewide planning document that provides policy makers with relevant information to help guide airport development. The SASP is developed by the Minnesota Department of Transportation (MnDOT) Office of Aeronautics in partnership with many stakeholders including airports, pilots, businesses, and the FAA. The SASP identifies the needs of Minnesota's aviation system and develops the allocation of available resources to meet those needs in a responsible manner. The most recent update to the SASP occurred in 2012 and a new update is currently underway as of this writing.

The most recent SASP identifies FSE as an Intermediate Airport. Intermediate Airports have a paved primary runway greater than 3,000 feet in length and capable of accommodating most single-engine aircraft and some multi-engine aircraft. Minnesota Statures 360.305, *Expenditures for Airports and Navigation*, defines an intermediate airport as "those used or intended for use by single engine or light to medium multiengine aircraft and shall include vertical takeoff and landing areas and short takeoff and landing areas not exceeding 90 (aircraft)." They play many roles in their community and enable direct connections to larger cities and airports in the region. Intermediate Airports are the most common type in Minnesota, with 83 present throughout the state. Intermediate Airports generally have at least a 2,400 foot runway, a non-precision instrument approach, 24-hour access to 100LL fuel, and the Minnesota Department of Transportation (MnDOT) recommends complete perimeter fencing.

1.2.3 NPIAS

The National Plan of Integrated Airport Systems (NPIAS) is a report submitted to Congress by FAA on a bi-annual basis, which identifies airports included in the National Airspace System (NAS), discusses the various roles they serve, and determines development projects eligible for federal funding under the Airport Improvement Program (AIP). The 2017 – 2021 NPIAS identifies 3,340 public use airports (3,332 existing and 8 proposed) that contribute to the national air transportation system, which represents about 65% of the 5,136 public use airports and 17% of the 19,536 total airport facilities in the U.S.

Airports are grouped into two major categories under the NPIAS: primary and nonprimary. Primary airports have scheduled air carrier service and at least 10,000 annual enplaned passengers. GA aircraft typically use nonprimary airports which are grouped into five categories: national, regional, local, basic, and unclassified. FSE is one of 20 airports within Minnesota categorized as basic. Basic airports often have a moderate level of activity, with an average of 10 piston-based aircraft, and no jets, and link the local community with the national airport system. The NPIAS estimates five-year costs for airport improvements eligible for Federal development grants under the AIP. Approximately $1.06 million is estimated for development at FSE during this period.

1.2.4 Fosston City Ordinance and Comprehensive Plan

The most recent City of Fosston Comprehensive Plan (FCP) was completed in 2008 and serves as a blueprint to fulfill the community vision. The primary goal for transportation, as described by the FCP, is to provide and maintain a safe and efficient transportation system. One of the policies to pursue this goal is the continued upgrading and maintenance of the Airport. To this end, the Plan anticipated several major improvements for the Airport that have since been completed including crack repair, a SRE equipment storage building, a snow plow truck, and paved taxiway construction. A focus group conducted as part of the FCP acknowledged that the Airport serves the community and expansion opportunities exist. The City Council passed a zoning ordinance for the City, including the Airport, on November 26, 2001. The zoning of the Airport is adopted from the Federal Civil Air Regulations and State of Minnesota Rules. Airport zoning regulations are found in the City Ordinance within Chapter 95: *Airport*. The ordinance specifies operational restrictions such as restricting running aircraft from being left unattended, establishes the traffic pattern at 800 feet above ground level, and establishes departure procedures. The Land Use section of the Plan specifies that the Airport is categorized as Public Land. The areas adjacent to the southeast of the Airport are categorized as industrial with some agricultural. The primary change anticipated in this area by the FCP is expansion of industrial land use, which is not expected to conflict with the Airport. Existing and future land uses can be seen below in **Figure 1-1** and **Figure 1-2**.

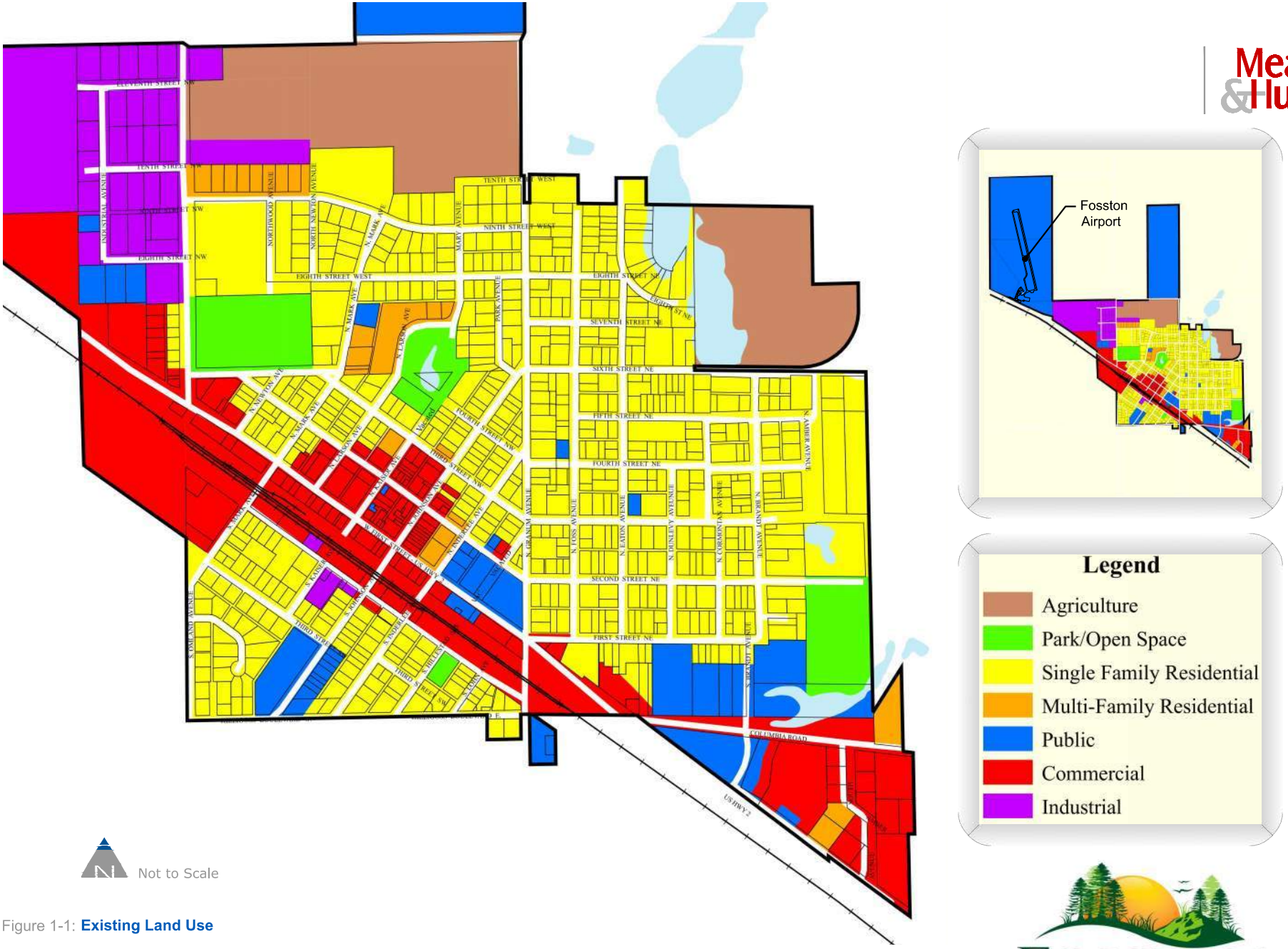
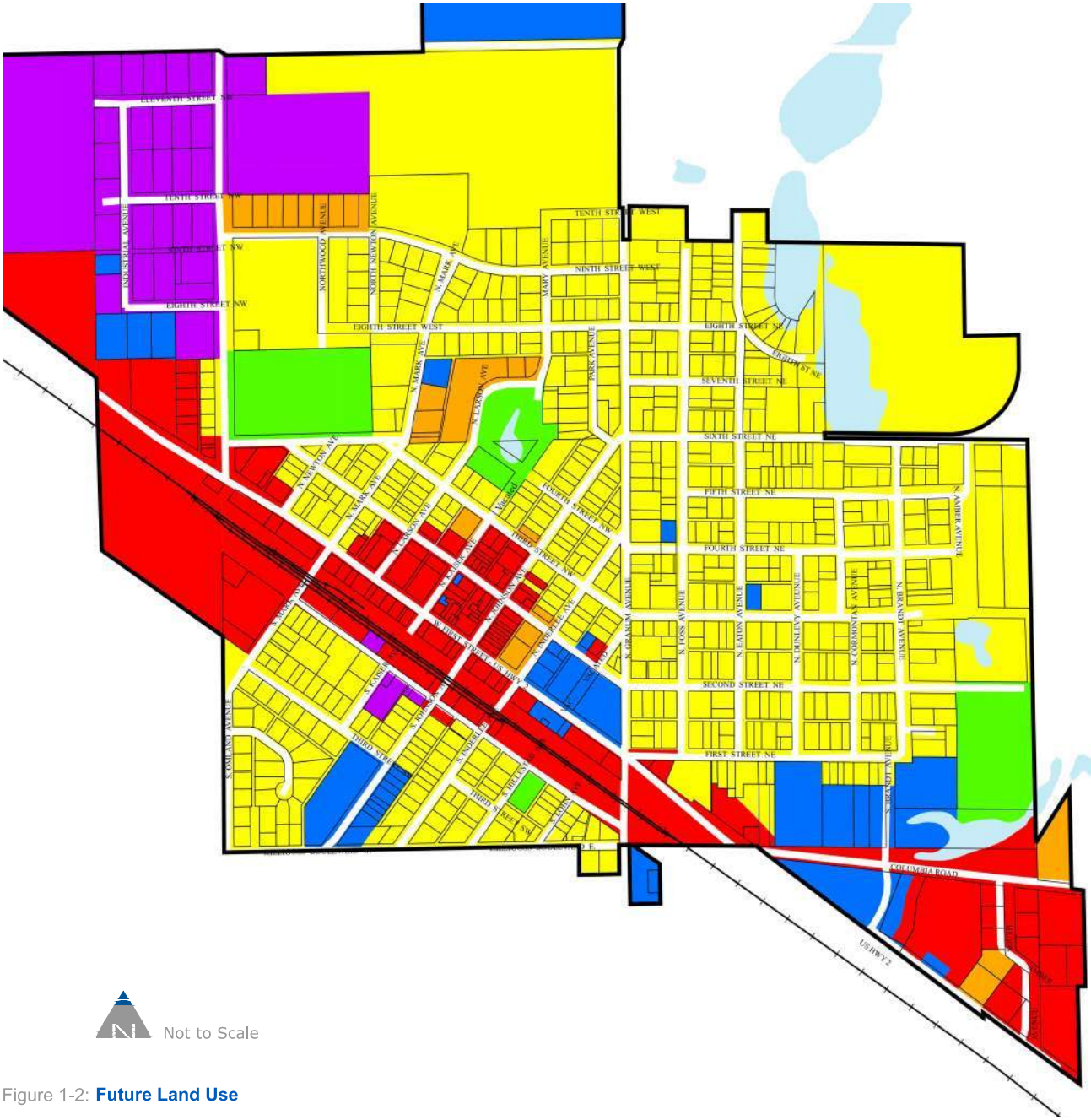
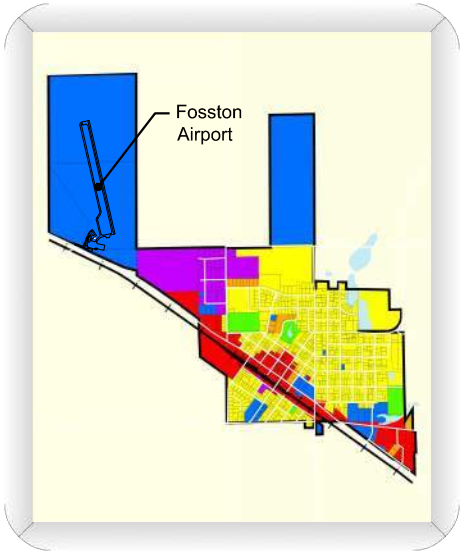


Figure 1-1: **Existing Land Use**

Source: *City of Fosston Existing Land Use Map*





Legend

- Agriculture
- Park/Open Space
- Single Family Residential
- Multi-Family Residential
- Public
- Commercial
- Industrial

Not to Scale

Figure 1-2: **Future Land Use**

Source: *City of Fosston Future Land Use Map*

FOSSTON
WHERE THE PRAIRIE MEETS THE PINES

1.2.5 Polk County Ordinance

The City of Fosston is located within Polk County, approximately ten miles from its eastern border. Polk County is nearly 2,000 square miles in size and also contains the Crookston Municipal and Fertile Municipal Airports. Due to the large size of the County, the ordinance does not focus specifically on FSE but requires separations for certain land uses from airports in general. These restrictions include minimum separations from animal feedlots and solar farms.

1.3 Airside Facilities

The runways, taxiways, instrument approaches and surrounding airspace connects the Airport to the national airspace system. The Airport has a single utility runway that is 3,502 feet long and 75 feet wide and designed for aircraft 12,500 pounds or less. Additional information about the runway, such as lighting types and pavement strength, are shown below in **Table 1-5**. Although airside facilities are not the focal point of this report, they serve as a bottleneck and can determine the type of aircraft able to access the landside facilities and are therefore important to consider. Airport facilities are shown in **Figure 1-3**. To this end, the remainder of the chapter is organized to present Airport facilities in the order an aircraft arriving at the Airport would encounter them. This provides an organizational structure for the chapter and serves as a narrative guide.

Table 1-5: Runway Information

Length x Width (feet)	Surface	Lighting	Visual Glide Slops Indicator	Weight Bearing Capacity
3,502 x 75	Asphalt	REIL, MIRL*	PAPI at each end	Single Wheel: 12,500 pounds

*Notes: *MIRL does not meet current standards as Runway 34 light are not amber for the last half.*
REIL: Runway End Identifier Lights
MIRL: Medium Intensity Runway Lighting
PAPI: Precision Approach Path Indicator

1.3.1 Airspace

The first interaction an aircraft has with most airports is the surrounding airspace. Due to the isolated location of the Airport the airspace in the vicinity is generally not complex, as shown in **Figure 1-4**. A legend is provided in **Table 1-2**. The airspace in the vicinity includes Class E, Class G and a terminal radar service area (TRSA) based around Hector International Airport (FAR) in Fargo, North Dakota. Class E airspace is generally the least stringent airspace directly controlled by Air Traffic Control (ATC). Although Class E airspace normally begins at 1,200 feet above ground level (AGL), the floor of Class E airspace at FSE drops to 700 feet within approximately seven nautical miles of the Airport. This provides protection for aircraft using instrument approaches, a frequent practice at rural airports. Class G airspace is not directly controlled by ATC, while TRSAs are areas where pilots may voluntarily participate in radar services. Neither of these categories have significant impacts on FSE.

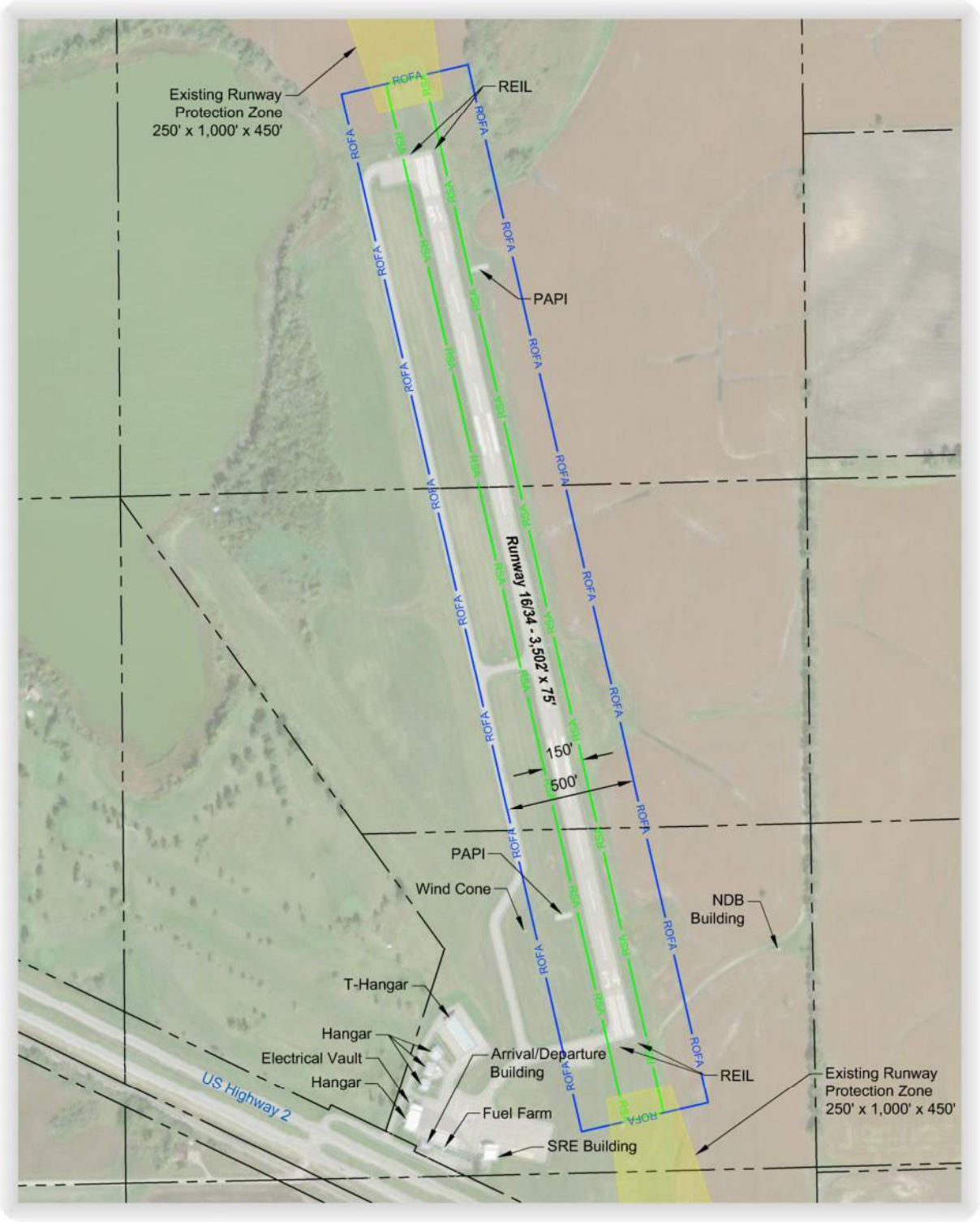
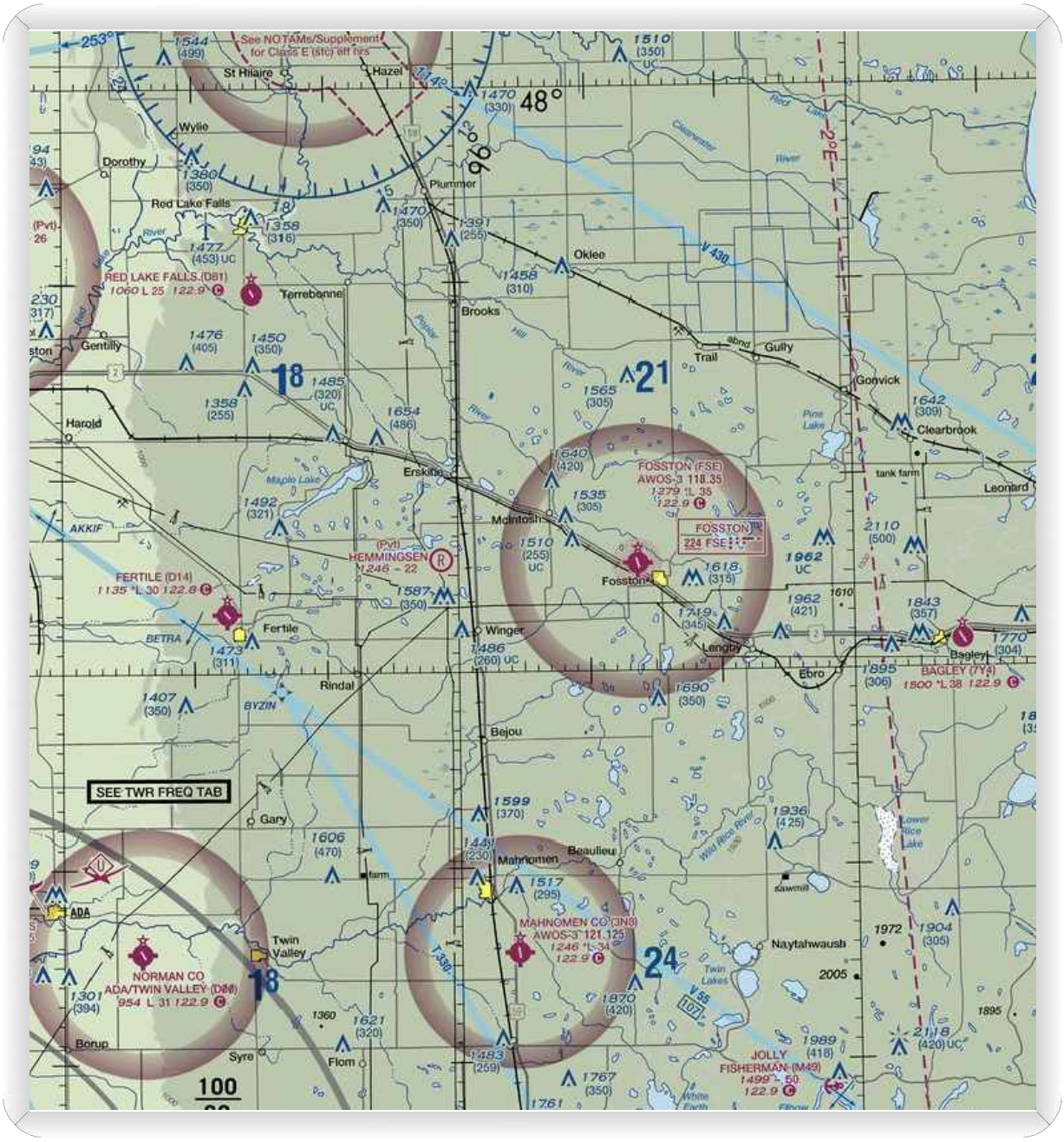


Figure 1-3: **Airport Facilities and Surfaces**

Source: *Polk County, Minnesota Open Data Portal, Google Maps*



0 5 10 15

Graphic Scale in Miles

Figure 1-4: **Surrounding Airspace**

Source: *Sky Vector Aeronautical Charts (https://skyvector.com/)*

Table 1-2: Selected Aeronautical Sectional Chart Legend	
Explanation	**Symbol**
Class E Airspace beginning at 700 feet	
Obstructions with elevations in MSL and AGL	
Restricted or Private (Soft surfaced runway or hard surfaced runway less than 1500' in length)	
Hard surface runways 1500 ft. to 8069 ft. in length. Airports with control towers are shown in blue, all other in magenta.	
Terminal Radar Service Area	

1.3.2 Instrument Approach Procedures

Instrument approaches provide a conduit from the surrounding airspace to the Airport, particularly during inclement weather when a visual approach is not possible. There are two non-precision RNAV (GPS) approaches to each end of the runway and a non-directional beacon (NDB) approach to the Runway 34 end. Each RNAV (GPS) approach has a one-mile visibility approach minimum and a minimum decision altitude of approximately 340 feet. The NDB approach also offers one-mile visibility minimums for small aircraft, although the minimum decision altitude is 781 feet. NDBs are an aging technology and are being phased out around the country, while GPS approaches are generally preferred as they require less infrastructure.

1.3.3 Navigation Aids

Navigation aids (NAVAIDs) assist pilots in a variety of ways when arriving, departing, or maneuvering through an airport. The majority of NAVAIDs provide either visual or electrical cues to assist pilots. Prominent NAVAIDS at FSE are discussed in this section. The rotating beacon helps pilots locate and identify the Airport during nighttime hours and poor visibility conditions, when visibility is less than 3 miles and/or ceilings are less than 1,000 feet. The beacon alternates green and white in 360 degrees, which is standard for civilian airports. The beacon at FSE was installed in 2007 and is located adjacent to the T-hangar near the Airport entrance.

Although not technically a NAVAID, runway pavement markings provide orientation and runway identification. Runways with precision instrument approaches have additional markings to serve as visual cues for landing pilots. As FSE does not have a precision approach the only required markings are the landing designator, centerline, and threshold markings. Each end of Runway 16/34 has aiming point markings although they are not required for runways less than 4,200 feet long. Finally, wind cones provide real time wind information to pilots as they are landing or taking off. The wind cone at FSE is located near the Runway 34 threshold approximately 300 feet to the left of the centerline. Medium intensity runway lighting (MIRL) provide a visual cue for pilots navigating the Airport. However, Runway 13 does not have amber lights on the last half of the runway, as is standard for runways with instrument approaches. Other lighting NAVIADs at FSE include runway end identified lights (REILs) and a precision approach path indicators (PAPIs) at each end of the runway. REILs identify the runway end through a pair of synchronized

flashing lights and are particularly helpful when artificial light in the vicinity may confuse the pilot, and during poor visibility conditions. The Airport PAPI is a four-light unit which indicates a pilot's position relative to the prescribed glideslope angle.

1.3.4 Crosswind Coverage

Even if an aircraft can successfully navigate to the Airport, crosswinds directly impact performance and are a factor in determining what aircraft can operate on a given runway. Excessive crosswinds can also make it difficult for aircraft to safely land or takeoff. GA aircraft are particular susceptible to crosswinds given their relatively slower approach speed and lower weight. To account for the variation in susceptibility to crosswinds the FAA has assigned allowable crosswinds for each runway design code (RDC). **Table 1-3** shows the allowable crosswind component for each RDC and **Table 1-4** below shows the crosswind coverage at each runway end for corresponding aircraft and weather types.

Table 1-3: Crosswind Limitations

RDC	Allowable Crosswind Component
A-I and B-I	10.5 knots
A-II and B-II	13 knots
A-III, B-III, C-I/D-I through D-III	16 knots

Table 1-4: Crosswind Coverage

Crosswind Coverage	*Rwy 16*	*Rwy 16/34*	*Rwy 34*
All Weather Conditions			
10.5 knots	63.73%	*93.59%*	52.00%
13 knots	64.97%	*96.78%*	53.95%
16 knots	65.79%	*98.98%*	55.32%
20 knots	66.07%	*99.77%*	55.84%
Visual Flight Rules (VFR)			
10.5 knots	72.33%	*95.07%*	95.07%
13 knots	73.35%	*97.51%*	97.51%
16 knots	74.03%	*99.22%*	99.22%
20 knots	74.26%	*99.83%*	99.83%
Instrument Flight Rules (IFR)			
10.5 knots	88.85%	*98.10%*	92.48%
13 knots	89.07%	*99.06%*	93.23%
16 knots	89.22%	*99.68%*	93.70%
20 knots	89.26%	*99.93%*	93.90%

Source: National Climatic Data Center, FAA Standard Wind Analysis Tool
Station: FSE AWOS, Period of Record: 2008 – 2017

1.3.5 Taxiways and Taxilanes

Taxiways not only allow aircraft to transit between the runway and terminal but also promote efficient circulation throughout an airport. A full length parallel taxiway supports Runway 16/34. This taxiway has a 45 degree slant as it approaches the terminal area and provides a single access point to the terminal area. Once the taxiway joins the ramp, various taxilanes allow aircraft to transit to hangars, fueling tanks, and other landside facilities.

1.4 Landside Facilities

Landside facilities provide services such as fueling, storage, maintenance and staging areas for pilots and passengers. The landside facilities are bordered by US Highway 2 to the south, a golf course to the west, and the runway and taxiway to the north and east. This section provides a summary of landside facilities.

1.4.1 Apron

Aprons are usually the first point of contact for arriving aircraft. Although taxilanes occupy a portion of the apron, approximately 40,000 square feet on the western portion of the apron is open to allow aircraft to maneuver through the area, access various hangars and the Arrival/Departure (A/D) building, and use the self-service fuel. Comparatively, approximately 35,000 square feet on the eastern portion of the apron is dedicated to aircraft parking and ten aircraft tie-downs occupy this area. However, this parking area is partially located within the departure surface of Runway 16, which should ideally be kept clear of obstacles such as parked aircraft.

1.4.2 Arrival/Departure Building

Often the initial gathering point for passengers and pilots, the Arrival/Departure (A/D) is centrally located on the apron near the airport entrance. The building is 1,008 square feet and had several improvements approximately ten years ago, including a new pilot lounge in 2005 and new roofing shortly thereafter. The building is listed as in fair condition in 2010 Airport Layout Plan Narrative Report.

1.4.3 Hangars

There are a total of five hangars at FSE. Three of the hangars are intended for individual aircraft while the agricultural hangar is a large box hangar and the T-hangar has six individual units. In total, these facilities can comfortably hangar approximately ten aircraft. As there are currently 11 aircraft based at the Airport, hangars are at capacity and interested pilots are unable to base additional aircraft here. As there have not been any expansions to hangar capacity at FSE for over two decades, this places a limitation on the Airport's growth.

1.4.4 Supporting Facilities

A new SRE building was constructed in 2009, is located near aircraft parking, and stores a tractor with attachments for snow removal and grass mowing. Nearby, a 2,000 gallon fuel tank is accessible to aircraft 24 hours a day, as fuel can be purchased with a credit card. Access to the Airport is available directly off US Highway 2 where an area for vehicle parking is located.

2 Chapter 2: Forecast

2.1 Introduction

This chapter presents aviation activity forecasts at the Fosston Municipal Airport (FSE) for the twenty-year planning horizon, using a base year of 2017. Aviation activity forecasts are a key step in the planning process. They form the basis for future demand-driven improvements at the Airport and are often referenced by other studies and policy decisions. This chapter presents aviation activity forecasts in the following order:

- Recent General Aviation Trends
- Projections of Based Aircraft and Fleet Mix
- General Aviation Operations
- Summary

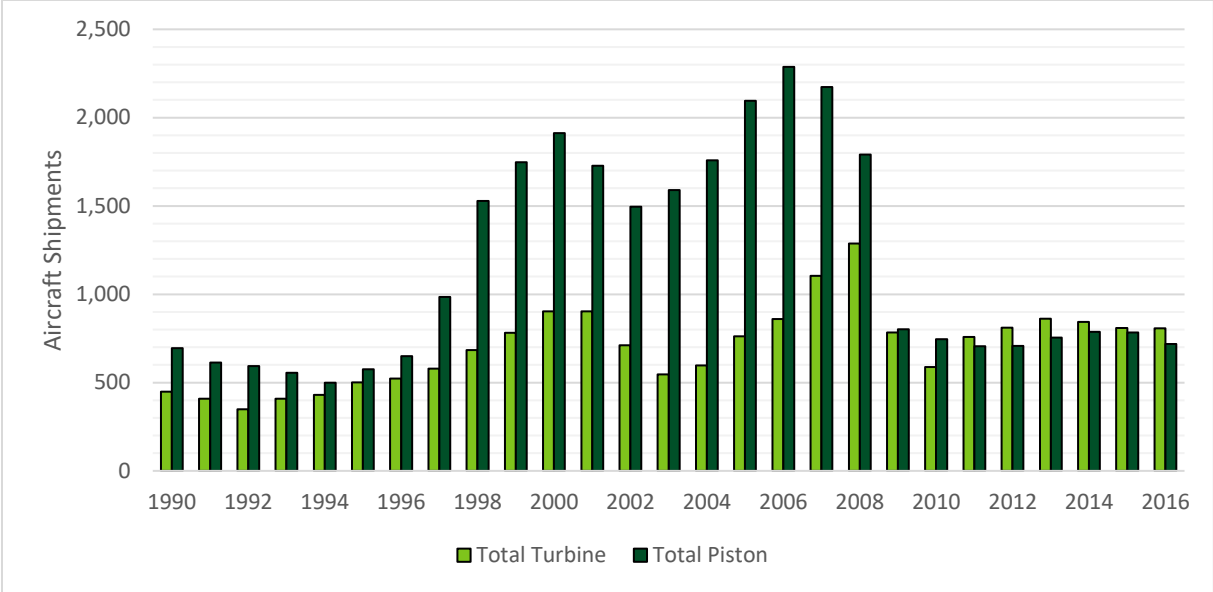
2.2 General Aviation Trends

General aviation (GA) represents all civil aviation activity not defined as commercial. GA includes a variety of users and activities, including corporate and business operators, recreational users, flight training, agricultural applications, and law enforcement and other government uses. The 2017 report published by the Federal Aviation Administration (FAA), *The Economic Impact of Civil Aviation on the US Economy,* indicates that GA plays a significant role in Minnesota's economy. As of 2014, GA was responsible for 3.2% of the total state Gross Domestic Product (GDP) and 133,729 jobs, or 3.7% of total jobs within the state. The GA presence at FSE is the dominant force of aviation operations and GA trends on a local, state and national level will likely impact Airport activity. Several aspects of GA activity are changing and planning for the future of FSE should account for these trends.

There has been a decrease in piston aircraft as well as certificated pilots currently active. Between 1980 and 2009 a decrease of 28 percent was seen among all categories of pilot certification. The rising cost of aircraft ownership and operation is a leading factor in declining pilot numbers. Additionally, the overall decline in pilot population suggests that student pilots are not replacing retiring pilots at an effective rate. This is supported by decreasing instructional hours, an increasing average age of pilots, and a downward trend in student pilots. Although flight training is declining as a whole, specialized training areas can remain busy. The University of North Dakota is located approximately 70 miles to the northwest and utilizes FSE for flight training. In 2017 UND aircraft made up over 50 percent of instrument approaches conducted at the Airport. Therefore, while flight training originating out of the local nontowered airfields is unlikely to increase, continued flight training operations at FSE are likely.

There are two primary areas of forecasted growth that may impact FSE. The first is the increase in turbine aircraft. The FAA 2017 FAA Aerospace Forecast reports that in 2016 single engine piston deliveries decreased by 7.4 percent while jet deliveries increased 1.8 percent. This reflects the post 2008 recession trend of an increase in turbine aircraft, surpassing piston aircraft. This trend is illustrated in **Chart 2-1**, as reported by the General Aviation Manufactures Association (GAMA). Although turbine aircraft are becoming more prominent, the runway length at FSE limits the size of aircraft able to utilize the Airport. However, small turbine aircraft such as turboprop and light jets are able to use this runway length. Growth in local industry is likely to have an impact in this category. Chapter 3, *Facility Requirements*, will provide a closer examination of future aircraft types.

Chart 2-1: Aircraft Shipments



Source: Source: GAMA, Mead & Hunt

The second trend that may impact FSE is the growth of Light Sport Aircraft (LSA). LSA is a relatively new category of aircraft added in 2005 by the FAA. In 2012, LSAs were reclassified as experimental aircraft. The difference between LSAs and traditional GA single engine aircraft is mainly one of performance and size. LSAs are limited to a maximum takeoff weight of 1,320 pounds (compared to 2,550 pounds for the Cessna C-172 Skyhawk, a common GA aircraft), maximum stall speed of 45 knots (51 mph), and a maximum of two seats, in addition to fixed gear and a lack of a cabin pressurization system. Common examples of LSA aircraft include the Cessna Skycatcher, Legend Cub, Van's RV-12, and the Harmony LSA. Wingspans usually fall between 30 feet to 40 feet, but can vary, and hangar needs are very similar to GA single engine piston aircraft. It is likely these aircraft will play a role in the future of FSE with increasing numbers throughout the fleet.

2.3 Based Aircraft and Fleet Mix

Based aircraft are often a predominant factor in predicting activity at GA airports. This section uses industry standard practices, such applying national trends and linear regression, to project future activity at FSE. However, as based aircraft at an airport are usually not a homogenous group but consists of different types of aircraft, driven by the type of aviation they support. Business aviation will often favor turbine aircraft due to their greater versatility and range, while recreational pilots will often prefer single engine aircraft due to their comparatively lower cost to own and operate. It should also be noted that an ultralight is based at FSE which is reflected in the "other" category in the following forecasts. While this aircraft does not count towards the total based aircraft at FSE, it is important to consider all aircraft as they will impact facility requirements. For these reasons, the following methodologies project growth for each aircraft type independently.

2.3.1 Terminal Area Forecast (TAF)

The FAA projects future aviation activity in its Terminal Area Forecasts (TAF). Forecasts are prepared for major users of the National Airspace System including air carrier, air taxi/commuter, general aviation, and military. These forecasts are prepared to meet the budget and planning needs of the FAA and provide information for use by state and local authorities, the aviation industry, and the public. The 2017 TAF

projects ten based aircraft at FSE for the next twenty years. However, the TAF is developed using national trends and omits local trends, such as business and regional flight training, which drive activity at FSE.

2.3.2 Minnesota State Aviation System Plan (SASP)

The growth rate for each type of based aircraft at state airports are projected within the SASP. These growth rates are applied to the existing aircraft at FSE below in **Table 2-1**. The SASP growth rates closely align with anticipated national trends, although single engine aircraft are expected to experience modest growth within Minnesota. The forecast growth rates vary slightly from the SASP due to the difference in forecasted years. Projected based aircraft are shown to the hundredths of a decimal place to better depict incremental growth

Table 2-1: Based Aircraft - SASP

Year	Single	Multiengine	Turboprop	Jet	Helicopter	Sport	Other	Total
2017	7.00	1.00	0.00	0.00	1.00	1.00	1.00	11
2022	7.26	1.02	0.05	0.12	1.09	1.17	1.04	12
2027	7.52	1.04	0.11	0.25	1.18	1.37	1.08	13
2032	7.80	1.06	0.17	0.39	1.28	1.61	1.13	13
2037	8.09	1.08	0.23	0.55	1.39	1.88	1.17	14
2017 – 2037 CAGR	0.73%	0.41%	*N/A*	*N/A*	1.67%	3.21%	0.79%	1.36%
2015 – 2030 SASP CAGR	*0.72%*	*0.40%*	*N/A*	*N/A*	*3.11%*	*N/A*	0.79%	*N/A*

Source: 2013 SASP, Mead & Hunt

2.3.3 FAA Aerospace Forecast

This methodology uses the same technique as the SASP forecast but uses the growth rates projected in the 2017 FAA Aerospace Forecast. **Table 2-2** shows the projected based aircraft alongside the CAGR rates of the 2017 FAA Aerospace Forecast.

Table 2-1: Based Aircraft - FAA Aerospace Forecast

Year	Single	Multiengine	Turboprop	Jet	Helicopter	Sport	Other	Total
2017	7.00	1.00	0	0	1.00	1.00	1.00	11
2022	6.72	0.99	0	0	1.08	1.31	1.00	11
2027	6.43	0.97	0	0	1.17	1.63	1.00	12
2032	6.13	0.94	0	0	1.27	1.95	1.01	12
2037	5.88	0.91	0	1	1.39	2.27	1.01	12
2017 – 2037 CAGR	-0.86%	-0.47%	N/A	N/A	1.66%	4.18%	0.06%	0.60%
2015 – 2030 Aero. CAGR	0.72%	0.40%	N/A	N/A	3.11%	N/A	0.79%	N/A

Source: 2017 FAA Aerospace Forecast, Mead & Hunt

2.3.4 Regression Analysis

Regression analysis derives the relationship between several independent variables based on their historic changes. If there is a high correlation between variables, then a forecast can be created which utilizes this relationship. The prediction ability of a given forecast is measured by the R^2 value, where 0 indicates no relationship and 1 indicates a perfect relationship. However, for linear regression to be an effective tool historical data for each variable is required. As detailed historical data is not available for the based aircraft or socioeconomic factors at Fosston over a long period of time, this methodology was not used.

2.3.5 Trend Synthesis

Due to a lack of data or inconsistencies within the data, many of the traditional forecast methodologies are either unreliable or do not take into account local factors. Although based aircraft at FSE have remained relatively stable over the past decade, this does not indicate a lack of demand, but rather a lack of available space. Potential based aircraft have been turned away from FSE due to a lack of hangar space, as there have not been any new hangars constructed for the past twenty years. In addition, the industrial park directly east of the Airport is expanding and is expected to continue to drive business aviation at the Airport. As the hangar space grows to accommodate existing demand and the industrial park expands, it is reasonable to assume based aircraft will increase.

The forecast shown below in **Table 2-3** takes these trends into account and projects future aircraft accordingly. Although single engine aircraft are not expected to increase on a national level over the next 20 years, the existing demand at FSE will cause an initial increase as hangar space become available. After this initial influx, growth rates will stabilize to reflect anticipated statewide trends. Multiengine aircraft are not expected to increase due to their higher costs to operate compared to a single engine piston aircraft, while lacking the advantages of turbine aircraft. Turbine aircraft consist of either turboprop aircraft or jet aircraft. Turboprop aircraft are often able to operate on shorter runways and are therefore more common at small airports. While both types of turbine aircraft are expected to experience growth in conjunction with local businesses, it is likely that turboprops will arrive earlier than jet aircraft. Jet aircraft would likely be limited to very light jets, such as the Cessna Mustang or Embraer Phenom 100. Finally, small recreational aircraft, such as home-built experimental aircraft and LSAs, are anticipated to make up a larger portion of the GA fleet in the future with growth projected by the SASP.

In summary, this methodology projects initial growth in 2022 due to additional hangars meeting existing demand before returning to growth rates depicted in the SASP for the duration of the planning period. As this forecast takes into account local factors while accounting for existing demand, which cannot be accounted for due to a lack of hangar space, this methodology is selected as the preferred forecast. Although the total aircraft is projected to increase to 19 the ultralight based at the Airport impacts the facility needs but does not count towards the Airport's FAA total based aircraft count. This total is also shown in **Table 2-3** for clarity.

Table 2-3: Based Aircraft – Trend Synthesis									
Year	**Single**	**Multi**	**Turboprop**	**Jet**	**Helicopter**	**Other**	**Sport**	**Total**	**FAA Based Aircraft Count**
2017	7	1	0	0	1	1	1	11	10
2022	9	1	1	0	1	1	2	15	14
2027	9	1	1	0	1	1	2	15	14
2032	10	1	1	0	2	1	3	18	17
2037	10	1	1	1	2	1	3	19	18
CAGR	1.80%	0.00%	N/A	N/A	3.53%	0.00%	5.65%	2.77%	2.98%

Source: Mead & Hunt, 2013 SASP

2.4 General Aviation Operations

The number of GA operations at an airport is partially influenced by the number of based aircraft. FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, states that "a general guideline is 250 operations per based aircraft for rural GA airports, 350 operations per based aircraft for busier GA airports, and 450 operations per based aircraft for busy reliever airports." The 2017 FAA TAF estimates that 8,300 GA operations occurred in 2017, excluding air taxi operations. With eleven based aircraft at FSE there are 755 operations per based aircraft. This is exceptionally high for a rural airport. However, FSE is in a unique position as it is often used for flight training by the University of North Dakota's aviation program. This FAA order also states that operations may be as high as 750 for busy reliever airports. As FSE is used as a flight training area by UND, which has over 100 aircraft dedicated to flight training, this higher number is sensible and will be used to forecast future operations. In additional, the 45 annual air taxi operations have been added to show total annual operations in **Table 2-4**.

Table 2-4: Aircraft Operations		
Year	**Aircraft**	**Operations**
2017	11	8,345
2022	15	11,370
2027	16	12,125
2032	17	12,880
2037	19	14,390
CAGR	2.77%	2.76%

Source: Mead & Hunt

2.5 Peak Aircraft Operations

The peak aircraft operations forecast identifies expected operations within the peak hour. Data from the FAA Traffic Flow Management System Counts (TFMSC) database over the past ten years was analyzed to determine the peak month for operations. Peak operations usually occurred in June with an average of 13.9 percent of annual operations. The peak month percentage share of operations was then applied to the total annual operations. The total number of month operations was divided by 30, the number of days in the peak month of June. Finally, a quarter of daily operations are believed to occur within the peak hour. This process is shown in **Table 2-5**.

Table 2-5: Peak Operations

Year	Annual Total	Peak Month % of Annual	Month Total	Peak Day	Peak Hour
2017	8,345	13.9%	1,160	39	10
2022	11,529	13.9%	1,580	53	13
2027	12,258	13.9%	1,685	56	14
2032	13,079	13.9%	1,790	60	15
2037	14,764	13.9%	2,000	67	17

Source: Mead & Hunt, TFMSC

Peak hour operations can be further divided into itinerant and local operations. This is an important consideration as each operation type drives different types of infrastructure needs. The 2017 FAA TAF indicates that 40 percent of operations are itinerant and 60 percent are local. These percentages are applied to peak hour operations below in **Table 2-6**.

Table 2-6: Peak Operations

Year	Total Peak Hour	Itinerant Peak Hour	Local Peak Hour
2017	10	4	6
2022	13	5	8
2027	14	6	9
2032	15	6	9
2037	17	7	10

Source: Mead & Hunt

2.6 Summary

Growth at FSE is anticipated to be driven by constructing hangars to meet existing demand in the short term while long term growth is tied to local businesses. The Airport is expected to remain busy due to flight training operations and business aviation. The FAA template for summarizing and documenting airport planning forecasts is presented in **Table 2-7**. The forecasts presented in this chapter will be used in combination with the inventory findings to determine facility requirements and critical aircraft at the Airport.

Table 2-7: FSE Airport Planning Forecasts Summary					
Activity Measure	**2017**	**2022**	**2027**	**2032**	**2037**
Passenger Enplanements					
Total	0	0	0	0	0
Aircraft Operations					
Itinerant					
Air carrier	0	0	0	0	0
Commuter/air taxi	45	45	45	45	45
Total Commercial	0	0	0	0	0
General aviation	3,300	4,530	4,832	5,134	5,738
Military	0	0	0	0	0
Local					
General aviation	5,000	6,795	7,248	7,701	8,607
Military	0	0	0	0	0
Total Operations	8,345	11,370	12,125	12,880	14,390
Based Aircraft					
Single	7	9	9	10	10
Multi	1	1	1	1	1
Turbo Prop	0	1	1	1	1
Jet	0	0	0	0	1
Helicopter	1	1	1	2	2
Other	1	1	1	1	1
Sport	1	2	2	3	3
Total	11	15	15	18	19
FAA Based Aircraft Total	10	14	14	17	18
GA OPBA	755	755	755	755	755

3 Chapter 3: Facility Requirements

3.1 Introduction

This chapter evaluates the existing facilities at FSE to determine their ability to meet the forecasted activity and demand. Similar to previous chapters, the focus of this chapter is on landside facilities, such as aircraft hangars and tie downs, and relevant design standards. Disparities are evaluated in this chapter and alternatives are recommended in Chapter 4.

3.2 Airside Facilities

Although landside facilities are the focal point, this chapter also provides a brief discussion of the airside facilities. These facilities often have direct impact on the landside facilities and it is important to determine if existing runway and taxiway infrastructure require any immediate improvements, as runways and taxiways are the conduit for aircraft to utilize an airport.

3.2.1 Critical Aircraft

As many airport facility restrictions are based on the characteristics of a specific aircraft, it is necessary to establish how aircraft are categorized. These categories are used throughout this triggering event narrative report when determining the current and future critical aircraft and associated existing design criteria. In order to identify the appropriate design parameters for a runway and associated facilities, aircraft are organized by dimensions and performance and categorized by the Runway Design Code (RDC). The RDC contains three separate parts, shown in **Table 3-1** in the order they are discussed below. The first component is the Aircraft Approach Category (AAC) and is designated by a letter that corresponds to the approach speed of an aircraft. The second component is the Aircraft Design Group (ADG) and is represented by a Roman numeral dependent on the aircraft tail height and wingspan. In the instance there is a conflict between the tail height and the wingspan, the higher and more restrictive group identifier is used. Finally, runway approach visibility minimums are expressed as the Runway Visual Range (RVR) in feet equal to quarter-mile increments, although this last component is not descriptive of aircraft characteristics.

Table 3-1: Runway Design Code Components

Aircraft Approach Category (AAC)		Airplane Design Groups (ADG)			Runway Visual Range (RVR)	
AAC	**Approach Speed**	**ADG**	**Tail Height**	**Wingspan**	**RVR**	**Visibility**
A	< 91 knots	I	< 20 feet	< 49 feet	1600	1/4
B	≥ 91 knots, < 121 knots	II	20 – 29 feet	49 – 78 feet	2400	1/2
C	≥ 121 knots, < 141 knots	III	30 – 44 feet	79 – 117 feet	3200	5/8
D	≥ 141 knots, < 166 knots	IV	45 – 59 feet	118 – 170 feet	4000	3/4
E	≥ 166 knots	V	60 – 65 feet	171 – 213 feet	4500	7/8
		VI	66 – 79 feet	214 – 261 feet	5000	1

Source: FAA Advisory Circular 150/5300-13A, Airport Design

Based on a review of the Traffic Flow Management System Counts (TFMSC) database, the most demanding aircraft that operates at the Airport is the King Air 200, which has a 55-foot wingspan and is 44 feet long, placing it in the B-II (small) category. The small designator signals that the aircraft has a maximum takeoff weight (MTOW) of 12,500 pounds or less. The 2010 Airport Layout Plan (ALP) also designates the King Air 200 as the critical aircraft. Although operations by this aircraft are intermittent, the Airport is generally currently designed to B-II standards. However, the current layout and facilities of the landside environment limits utilization by aircraft this size. By continuing to list the King Air 200 as the critical aircraft, the Airport can plan its facilities in a manner that will support future growth.

3.2.2 Airfield Design Standards

Runway safety zones and areas have direct implications on building layouts and setbacks. **Table 3-2** shows the dimensions for each of the B-II (small) design standards and the remainder of this section describes selected surfaces more relevant to this report in greater detail.

Approach and Departure Codes

The approach reference code (APRC) and departure reference code (DPRC) determine aircraft takeoff and landing restrictions for a specific runway. The RDC is composed of the same three components as the APRC: AAC, ADG, and visibility minimums. The DPRC is dependent on runway and taxiway separation and represents those aircraft that can take off from a runway while other aircraft are present on adjacent taxiways under certain meteorological conditions. The APRC determines the size of aircraft able to land on a runway while the DPRC determines what aircraft can takeoff when multiple aircraft are present.

Runway Protection Zones

The function of the RPZ is to protect people and property on the ground. This is enhanced by airport ownership of property within the RPZ. The FAA must be consulted if land uses within the RPZ are planned to include the following potentially incompatible uses:

- Buildings and structures
- Recreation land use
- Transportation facilities
- Fuel storage facilities
- Hazardous material storage
- Wastewater treatment facilities
- Above-ground utility infrastructure

To the north the area around the Airport is unoccupied and there are not any conflicts with the existing RPZ. However, to the south Highway 2 is located within the corner of the Runway 34 RPZ and any change to the RPZ or runway will require coordination with the FAA.

Runway Safety Area

The RSA is an integral component of the runway environment and enhances the safety of the runway environment by providing an area cleared, graded, and drained to be capable of supporting rescue or firefighting vehicles as well as aircraft that veer off the runway. The RSA is designed to contain 90 percent of runway overruns. This area must be free of objects except for those fixed in the RSA by function, which must be mounted on frangible structures if taller than three inches. Due to the important role of the RSA, their standards cannot be modified.

Table 3-2: Design Standards		
Criteria	**Existing Standard**	**Ultimate Standard**
Runway Length	3,502 feet	4,000 feet
Runway Width	75 feet	Same
Runway Shoulder Width	10 feet	Same
Runway CL to Holding Position	125 feet	Same
Runway CL to Parallel Taxiway	240 feet	Same
Reference Codes		
Approach Reference Code	B/II/5000	Same
Departure Reference Code	B/II	Same
Runway Protection Zone (RPZ)		
Inner Width	250 feet	Same
Length	1,000 feet	Same
Outer Width	450 feet	Same
Runway Safety Area (RSA)		
Length Beyond Runway End	300 feet	Same
Width	150 feet	Same
Runway Object Free Area (ROFA)		
Length Beyond Runway End	300 feet	Same
Width	500 feet	Same
Runway Obstacle Free Zone (ROFZ)		
Length Beyond Runway End	200 feet	Same
Width	250 feet	Same
Departure Surface		
Inner Width	1,000 feet	Same
Length	10,200 feet	Same
Outer Width	6,466 feet	Same
Threshold Sitting Surface		
Inner Width	400 feet	Same
Length	10,000 feet	Same
Outer Width	3,800 feet	Same
Part 77 Approach Surface		
Category	A(NP)	Same
Slope	20:1	Same

Runway Object Free Area

While aircraft may taxi and hold within the Runway Object Free Area (ROFA), it is prohibited to park aircraft or conduct agricultural operations. While most of the ROFA meets prescribed standards, a portion of the ROFA to the east of the runway is used for agricultural operations.

Runway Obstacle Free Zone

The Runway Obstacle Free Zone (ROFZ) is similar to the Runway Safety Area (RSA) in that it generally only permits frangible objects that are fixed by function. This area provides further protection for aircraft landing, departing, or conducting missed approaches at an airport.

Departure Surface

Any runway that supports instrument operations will have a departure surface. This provides a clear area for pilots to follow standard procedures. The current aircraft parking is located near the beginning of the departure surface and, as the slope of this surface is 40:1, aircraft parked in this location penetrate the departure surface. Chapter 4, *Alternatives*, will consider new locations for aircraft parking.

3.2.3 Runways

Runway length is based on the specific performance characteristics of the aircraft intended to use an airport. Runway 16/34 is currently 3,402 feet long and the existing landside facilities are oriented around the southern portion of the runway. The 2010 ALP depicts an extension to 4,000 feet to support operations by the King Air 200. The area could accommodate this length without requiring a relocation or closure of nearby roads, such as 390th St SE which is located a quarter mile north of the runway.

FAA guidance in Advisory Circular (AC) 150/5300-13A, *Airport Design*, recommends a crosswind runway when crosswind coverage is less than 95 percent. As shown in **Table 3-3**, the crosswind coverage for aircraft in the A/B-I categories do not meet this threshold. This includes small aircraft such as the Cessna 172 and Piper Cherokee. The 2010 narrative report and ALP developed a preferred alternative of a 2,800-foot runway north of the existing facilities, along a 05/23 orientation and intersecting the existing runway. This runway would initially be turf before being converted to a hard surface in the ultimate condition. As this report focuses on the building area of the Airport, this alternative is retained on the ALP.

Table 3-3: Crosswind Coverage

Crosswind Coverage	*Runway 16/34*
All Weather Conditions	
10.5 knots	*93.59%*
13 knots	*96.78%*
Visual Flight Rules (VFR)	
10.5 knots	*95.07%*
13 knots	*97.51%*
Instrument Flight Rules (IFR)	
10.5 knots	*98.10%*
13 knots	*99.06%*

Source: National Climatic Data Center, FAA Wind Analysis Tool
Station: FSE AWOS, Period of Record: 2008 – 2017

3.2.4 Taxiways and Taxilanes

The taxiways at FSE consist of a single parallel taxiway 240 feet west of the runway centerline for the majority of the taxiway, although the southernmost segment is separated by 400 feet. A single connection from the taxiway to the apron is provided on the southern edge of the parallel taxiway. The majority of taxiways are 35 feet wide, which meet the Taxiway Design Group (TDG) 2 standard. Although the taxiway leading from the apron turns approximately 70 degrees before intersecting Runway 16/34, this configuration is considered a direct connection by the FAA. Guidance in FAA AC 150/5300-13A, *Airport Design*, states that direct access from the apron to the runway is discouraged as pilots may inadvertently taxi onto the runway while expecting a parallel taxiway. This taxiway should be modified so pilots make an additional turn before entering the runway, such as onto a parallel taxiway, to comply with guidance.

A runup pad is also located near the Runway 34 threshold. Runup pads are often in locations where aircraft can perform a runup to test their engines before flight, before departing the Airport. However, the runup pad is currently located within the departure surface for Runway 16. As the departure surface should remain clear of penetrations to the extent practicable, such as aircraft using the runup pad, this pad should be removed. The existing taxiway configuration limits the Airport's ability to expand landside facilities farther east. As the taxiway includes the taxiway safety area a total of 79 feet in width, this further limits the potential for building expansion. Additional taxiway and taxilane design surfaces are shown in **Table 3-4**.

Table 3-4: Taxiway Design Group for Future Design Aircraft

Criteria	Category		
Taxiway Design Group Criteria	***TDG 1B***	***TDG 2***	***TDG 3***
Taxiway Width	25 feet	35 feet	50 feet
Taxiway Edge Safety Margin	5 feet	7.5 feet	10 feet
Taxiway Shoulder Width	10 feet	15 feet	20 feet
Airplane Design Group Criteria	***ADG I***	***ADG II***	***ADG III***
Taxiway Safety Area Width	49 feet	79 feet	118 feet
Taxiway Object Free Area Width	89 feet	131 feet	186 feet
Taxilane Object Free Area Width	79 feet	115 feet	162 feet

Sources: Planning Manuals, FAA AC 150/5300-13A

3.2.5 Pavement Conditions

Pavement is a crucial part of any airport on both the airside and landside, as it enables aircraft to maneuver through the area while making facilities more resilient to weather and regular use. The condition of the pavement has a significant impact on airport utility. Aging pavement not only makes it more difficult for aircraft to transit the area, but loose pavement is liable to damage aircraft or vehicles when affected by propeller wash or jet blast. In addition to utility and safety, pavement maintenance is an important aspect of fiscal responsibility. According to AC 150/5380-7A, *Airport Pavement Management Program,* maintaining pavement in good condition over its life cycle is four to five time less expensive than periodically rehabilitating a pavement in poor condition. Based upon a visual inspection by experienced engineers, a pavement condition index (PCI) rating is assigned to a particular piece of pavement but does not necessarily reflect its structural integrity. The PCI rating is scored on a scale of 1-100. A score of 100 indicates the pavement is in perfect condition while a score of 60 or less indicates that rehabilitation is likely required.

A 2016 Pavement Condition Report summarizes the pavement conditions of the Airport during a 2015 survey and set the overall PCI for the Airport at 79. However, a pavement rehabilitation project was completed during the fall of 2017 and a large portion of the apron and the taxilanes near the T-hangar have been rehabilitated and are in excellent condition, with the exception of a small section of pavement to the north of the T-hangar. In the event that additional hangars and taxiways are constructed to the north, this section of pavement would be rehabilitated or reconstructed at that time. Estimated pavement conditions for 2018 are shown in **Table 3-5**. Section names correspond to the labels shown in **Figure 3-1**.

Table 3-5: Pavement Condition

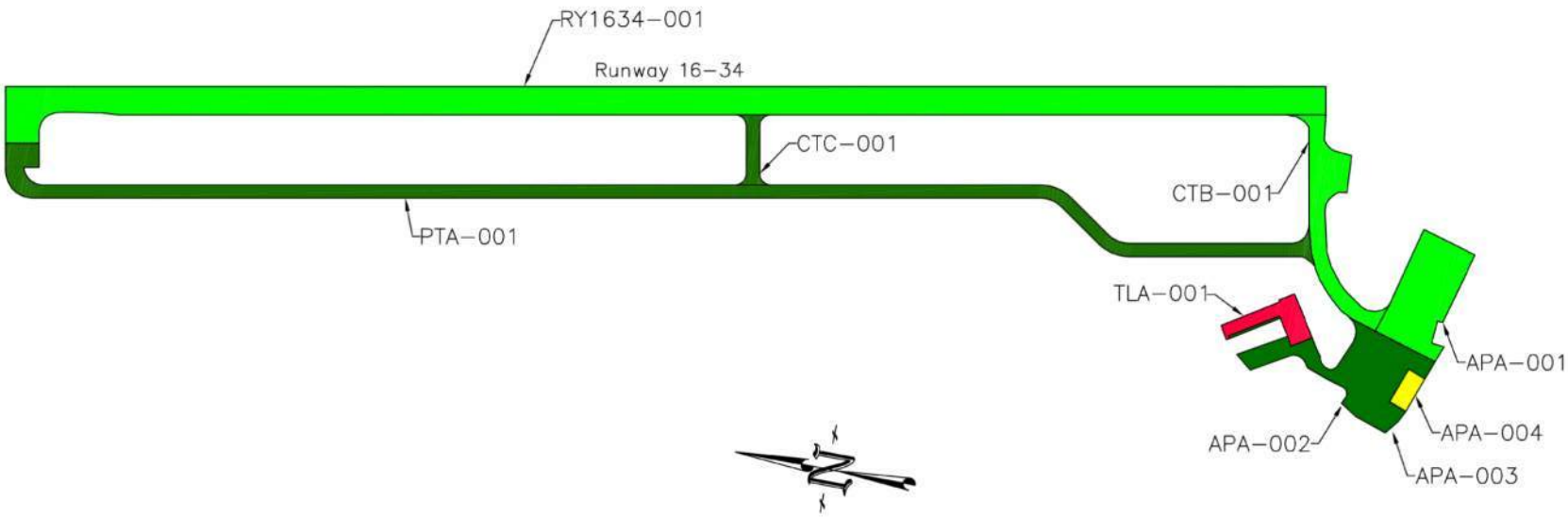
Branch	Section	LCD[1]		2012	2015	Annual Decline[2]	2018 Estimate	
Apron	APA-001	2002		85	74	2.0	68	
Apron	APA-002	2017		88	70	2.3	100[3]	
Apron	APA-003	2017		68	59	3.2	100[3]	
Apron	APA-004	2002		68	68	2.5	61	
Taxiway Connector	CTB-001	2002		85	77	1.8	72	
Taxiway	CTC-001	2012		100	98	0.7	96	
Parallel Taxiway	PTA-001	2012		100	99	0.3	98	
Runway	RY1634-001	2002		84	76	1.8	71	
T-hangar Taxilane[4]	PTA-001	2017	2002	40	36	4.9	100[3]	21

Notes: [1]Last Construction Date, which may include overlay or reconstruction. [2]2015 - LCD [3]This section was rehabilitated in 2017 and is assumed to be in excellent condition, though actual PCI value is unknown.
[4]A portion of this section was rehabilitated during the 2017 project, both values are shown.

3.3 Landside Facilities

3.3.1 Instrument Approaches

The Airport currently has an RNAV (GPS) approach with visibility minimums of 1 mile to each end of the runway, which is usable by aircraft with an AAC of C or lower. A Non-Directional Beacon (NDB) approach is also available to Runway 34. NDB approaches are becoming less common around the country as the FAA reduces VOR and NDB approaches to decrease maintenance costs and prepare for new technologies. However, as of June 2018, the FAA has not listed the FSE NDB approach as to be discontinued. The NDB approach is currently the only non-GPS approach at FSE. GPS approaches require aircraft to have specific equipment on board that is often more expensive than equipment required by an NDB. Although this approach will likely eventually be discontinued, the Airport should ensure that removal of the NDB does not have a significant impact to accessibility. This could be done by either replacing the NDB approach with a VOR, though this is not likely as the overall number of VOR approaches are being reduced, or waiting until a sufficient number of aircraft are able to conduct GPS approaches before removing the NDB approach.



	FAILED	SERIOUS	VERY POOR	POOR	FAIR	SATISFACTORY	GOOD	PCI INDEX
NS	0–10	11–25	26–40	41–55	56–70	71–85	86–100	

Not to Scale

Figure 3-1: **Pavement Conditions**

Source: *PCI Summary For Fosston Municipal Airport (FSE). Completed by ARA Dated July 2015.*

3.3.2 Aprons and Aircraft Parking

Aircraft aprons provide an area for aircraft to maneuver, undergo limited maintenance and provide temporary parking. FAA AC 150/5300-13A, *Airport Design,* states that the total amount of GA apron area required is based on local conditions and will vary from airport to airport. As stated in Chapter 1, the total size of the apron at FSE is approximately 75,000 square feet, excluding the center taxilane. Currently, the taxilane provides aircraft with a direct route to the runway from the apron before splitting into three separate taxilanes to direct aircraft to the various landside facilities. However, as the location of the aircraft parking is located in the departure surface of the runway, the apron should be reconfigured to allow for the relocation of aircraft parking while providing efficient aircraft circulation. Proposed layouts to address these issues will be discussed in greater detail in Chapter 4.

Aircraft parking will need to be relocated, and the type and number of aircraft to be accommodated must be considered. In Chapter 2 it was determined that by the end of the planning period the Airport could experience seven itinerant operations or 3.5 landings and 3.5 takeoffs. Itinerant aircraft will usually use temporary aircraft parking on the apron while based aircraft will typically prefer hangars. Therefore, relocated aircraft parking should be able to accommodate at least four aircraft at a time although additional parking can be made available if space is sufficient. The majority of operations are currently single-engine aircraft, although turbine aircraft will occasionally operate at the Airport and at least one tie down should accommodate turbine aircraft, such as the King Air 200.

3.3.3 Hangars

Hangars allow aircraft to be stored away from the natural elements and provide pilots a place to conduct limited maintenance. The number of hangars needed at a given airport is closely related to the number of based aircraft. Some airports also offer hangars for itinerant aircraft storage, usually as a service offered by an FBO. The preferred based aircraft forecast from Chapter 2 is shown below in **Table 3-6**.

Table 3-6: Based Aircraft Fleet Mix

Year	Single	Multiengine	Turboprop	Jet	Helicopter	Other	Sport	Total
2017	7	1	0	0	1	1	1	11
2022	9	1	1	0	1	1	2	15
2027	9	1	1	0	1	1	2	15
2032	10	1	1	0	2	1	3	18
2037	10	1	1	1	2	1	3	19

The number of hangars can be projected based on the number of aircraft expected to be based at the Airport over the 20-year planning period. Typically, T-hangars are used for single-engine aircraft while box hangars are used for multi-engine or turbine aircraft. The space required for each type of aircraft, including a safety zone around each aircraft, is shown in **Table 3-7**. Projections through the planning period for total hangar space demand were calculated based on the projected based aircraft number in **Table 3-6** and the space requirements from **Table 3-7**.

Table 3-7: Parking Area Sizes for Aircraft Fleet Mix		
Aircraft Type	**Examples**	**Approximate Square Feet**
Single Engine	Cessna 172, Cirrus SR-22	1,400 square feet
Multiengine & Helicopters	Piper Seneca, Beechcraft King Air	2,500 square feet
Small & Midsized Jets	Cessna Citation, Learjet	4,000 square feet
Large Business Jets	Gulfstream G550, Global Express	10,000 square feet

Source: Mead & Hunt, Inc.

As can be seen in **Table 3-8**, hangar demand is already at a slight deficit and the Airport is unable to accommodate additional aircraft. Growing businesses will increase the likelihood of turbine aircraft being based at the Airport. Box hangars near the existing Arrival/Departure (A/D) building or otherwise close to the road would allow these potential businesses to have a strong local presence while recreational pilots will likely prefer T-hangars due to the reduced monthly cost. Chapter 4 discusses the best way to meet both types of hangar demand.

Table 3-8: Hangar Demand					
Aircraft Type	**2016**	**2021**	**2026**	**2031**	**2036**
Single Engine (including Sport/Other)					
Projected Based Aircraft	9	12	12	14	14
Total Hangar Demand	12,600	16,800	16,800	19,600	19,600
Multiengine and Helicopters					
Projected Based Aircraft	2	2	2	3	3
Total Hangar Demand	5,000	5,000	5,000	7,500	7,500
Turbine Aircraft					
Projected Based Aircraft	0	1	1	1	2
Total Hangar Demand	0	4,000	4,000	4,000	8,000
Grand Total					
Hangar Space Available	15,700	15,700	15,700	15,700	15,700
Hangar Space Demand	17,600	25,800	25,800	31,100	35,100
Space Difference	**-1,900**	**-10,100**	**-10,100**	**-15,400**	**-19,400**

3.3.4 Supporting Facilities

Supporting facilities are oriented along the southern edge of the apron and include the A/D building, fueling area, vehicle parking, and Snow Removal Equipment (SRE) building. The SRE building was constructed in 2009, is in good condition, and is meeting current Airport needs. The fuel tank holds 2,000 gallons of 100LL and is meeting current needs as the majority of aircraft utilizing the Airport are piston driven. As local business aviation grows and turbine activity increases, adding a lower capacity Jet A fuel tank should be considered. However, this is not an immediate need and will likely be worth exploring once there is more interest in basing turbine aircraft at the Airport.

The A/D building has many of the necessary facilities, such as a crew rest area, flight planning computer, and restroom, but the building is aging and could be updated to accommodate future growth. Access to the Airport is provided by a single connection to U.S. Highway 2. Vehicles entering the Airport can either turn left to reach the various hangars or continue straight to park near the A/D and SRE buildings. Although this area is likely sufficient in size to accommodate future vehicles, it would benefit from clear markings and designated parking spaces. In the event an FBO is constructed at the Airport, having a dedicated lot for pilots, visitors, and employees would create a more notable presence and aid organization.

3.4 Summary

The Airport has an airside environment that is generally meeting current needs, although some improvements to the taxiway system are needed to comply with standards and improve circulation. Aircraft parking should be relocated and designed to accommodate future itinerant operations and additional turbine aircraft. Although the existing hangars and buildings are generally meeting current needs, the layout limits future expansion and buildings are aging. Replacing the buildings in their current location would continue to constrain the Airport's ability to expand the landside area in an organized fashion. Chapter 4 explores alternatives for addressing the issues discussed in this chapter while also addressing the long-term vision of the Airport.

4 Chapter 4: Alternatives

4.1 Introduction

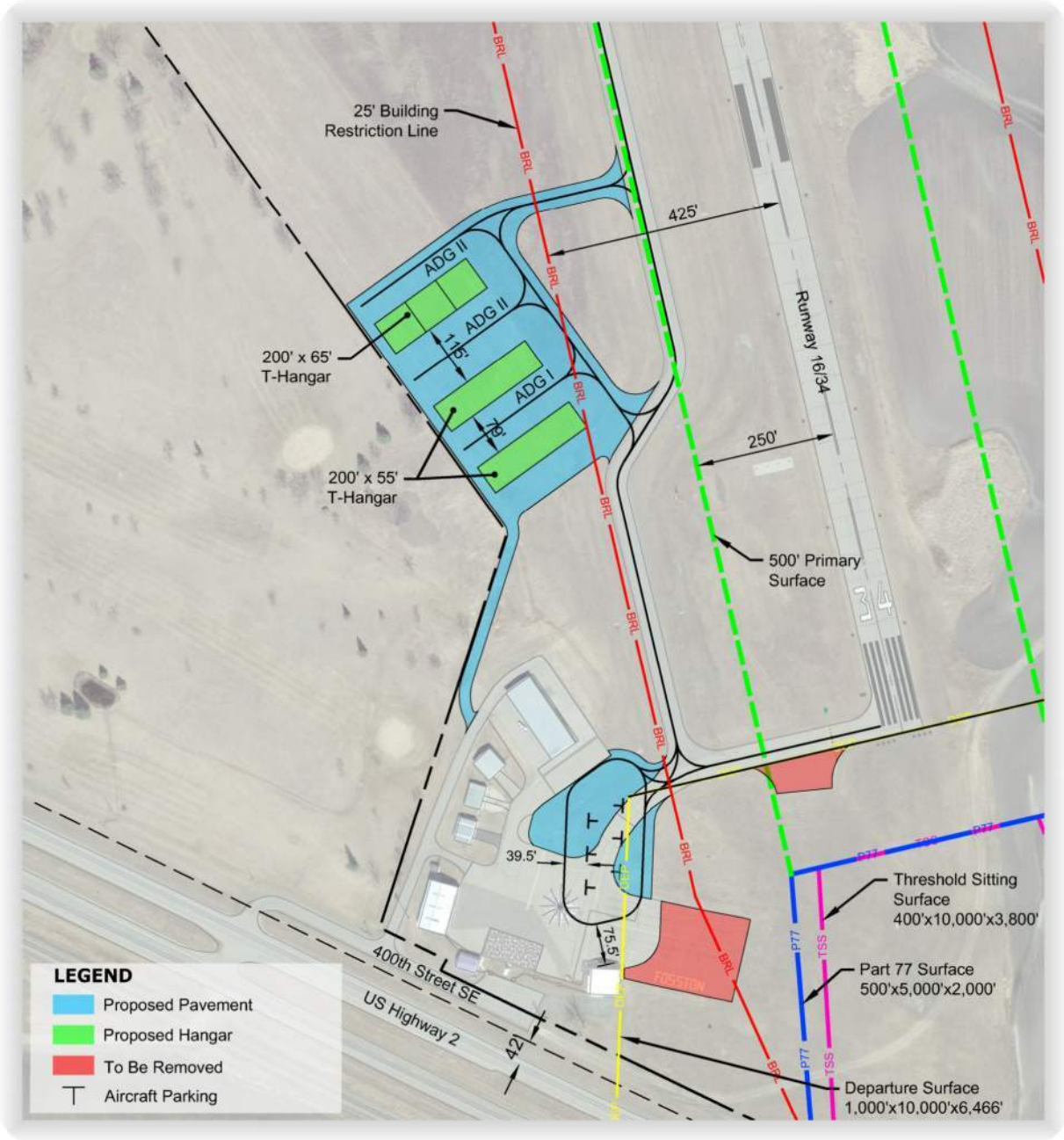
As discussed in Chapter 3, the building area at the Airport has several constraints. Existing key issues include the aircraft parking and runup pad in the departure surface, a lack of available hangar space, and a building layout that prevents expansion along a single existing axis. Several alternatives were developed to address these issues within the confines of site constraints. Notable site constraints are depicted in each graphic and include the 40:1 Departure Surface, 25-foot Building Restriction Line (BRL), Fosston Golf Club to the west, and U.S. Highway 2 to the south. This chapter provides a discussion of these alternatives intended to correct existing issues while planning sufficient facilities to meet future growth.

This report and updated Airport Layout Plan (ALP) focus on the landside facilities of the Airport. Therefore, most of the planned airside facilities, such as the runway, instrument approaches, and navigational aids, are retained from the 2010 ALP. Limited changes to the taxiway system will be necessary to provide efficient aircraft circulation and access to the proposed landside facilities. Although the Airport's landside facilities are designed to serve specific functions, their proximity to each other makes it difficult to consider the needs of a facility in isolation, as any change will have ripple effects on the surrounding infrastructure. Therefore, this chapter considers alternatives that will address the entirety of the Airport landside facility area concurrently with project phasing discussed in each respective section.

4.1.1 Alternative 1: Prioritize Existing Facilities

This alternative prioritizes preserving existing facilities while addressing key circulation and capacity issues. All current hangars would remain in their existing configuration to minimize interference with current tenants and operations, while new hangars would be constructed on the greenfield site to the north of the terminal area. The existing access road would be extended to permit vehicle access to two additional T-hangars and a single joined box hangar facility. This footprint would be entirely contained on existing Airport property as shown in **Figure 4-1**. Aircraft parking would be provided along the eastern edge of the expanded apron, which would be outside the departure surface, so parked aircraft would not penetrate the surface. Additionally, there would be ample room for aircraft, vehicles, and SRE equipment to maneuver on the western side of the ramp while leaving the self-service fuel area unobstructed.

The existing runup pad should also be removed due to its location in the departure surface. In the interim, before it is removed, chevrons can be added to indicate it is not to be used. The existing taxiway connection to the apron would be maintained on a short-term basis only. Although relocating the taxiway-apron connection to prevent direct access to the runway was considered, this relocation would constrain larger aircraft maneuvering due to the tight turns that would be necessary to navigate the area. Instead, to correct this connection, this alternative includes an ultimate condition shown in **Figure 4-2**. The ultimate condition would extend the parallel taxiway along its existing axis to provide a separation of 240 feet from the runway centerline for the full length of the taxiway. Once the taxiway extension is completed, a new connection from the apron to the taxiway could be constructed to prevent direct connection from the apron to the runway. The ultimate condition also includes two box hangars, one of which could house a local FBO, and space for large aircraft parking. This configuration would provide additional separation between piston aircraft and larger turbine-powered aircraft while preserving space near the self-service fueling.

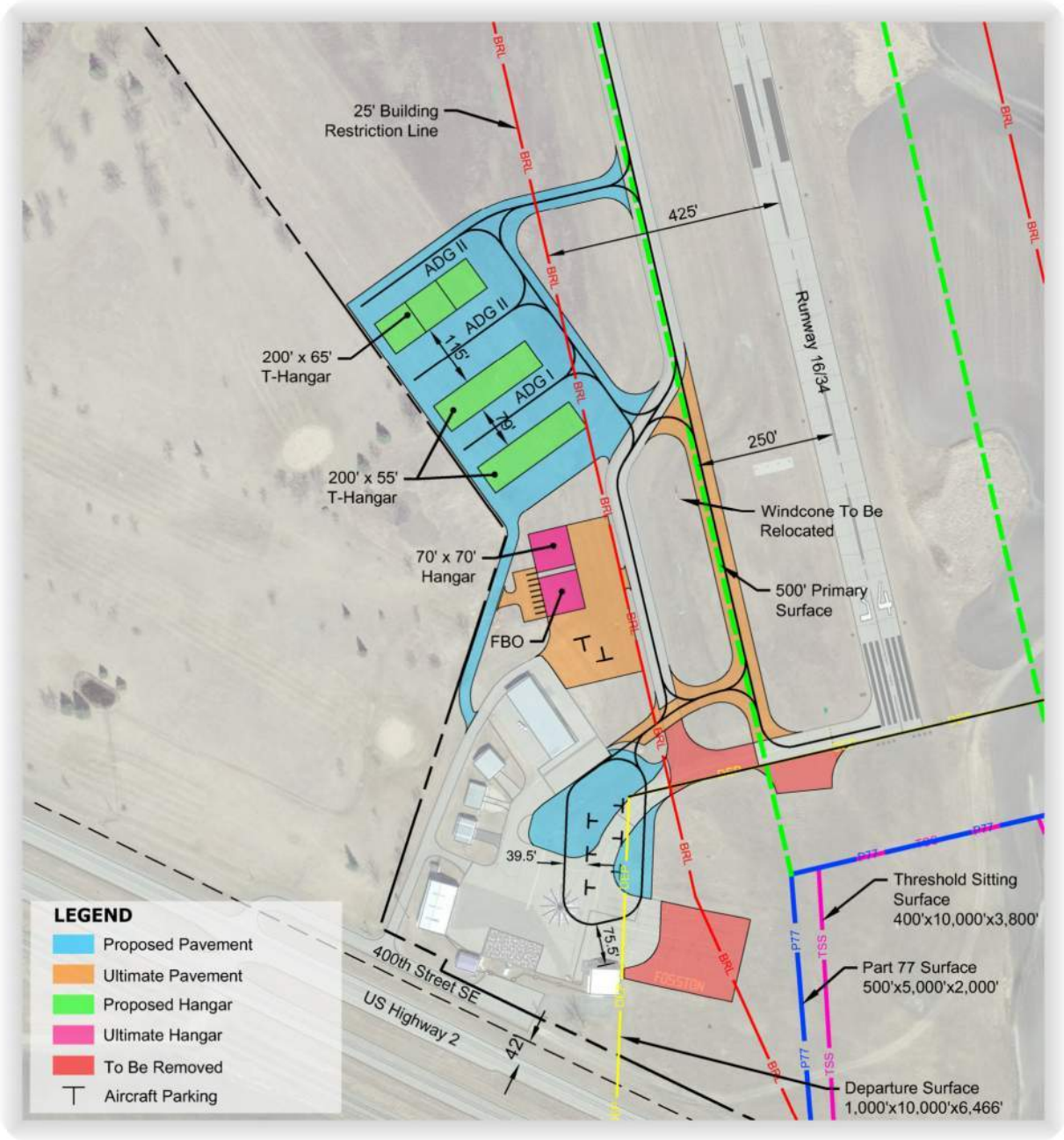


0 150 300 450
Graphic Scale in Feet

Figure 4-1: **Alternate 1: Near-Term Layout**

Source: *Polk County, Minnesota Open Data Portal, Google Maps*

FOSSTON
WHERE THE PRAIRIE MEETS THE PINES



0 150 300 450
Graphic Scale in Feet

Figure 4-2: **Alternate 1: Ultimate Layout**

Source: *Polk County, Minnesota Open Data Portal, Google Maps*

FOSSTON
WHERE THE PRAIRIE MEETS THE PINES

Although leaving most existing facilities in place would simplify construction and phasing, in the short-term it means the inefficient building layout would continue. The building area near Highway 2, the A/D Building, and fueling area offer a prominent location for future development as existing buildings age and need to be replaced. Therefore, this alternative was dismissed due to these long-term implications.

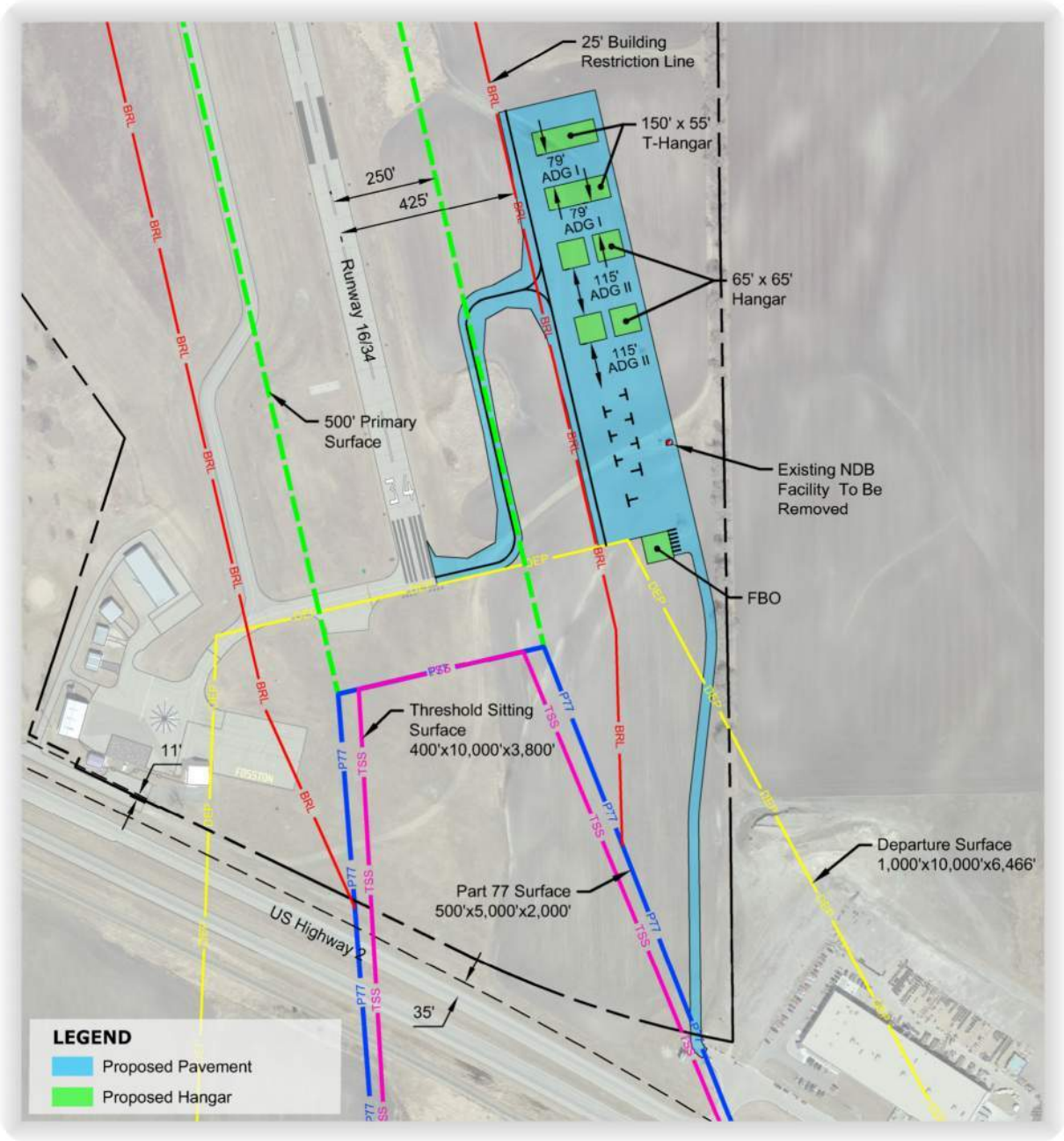
4.1.2 Alternative 2: Eastern Building Area

Although the existing building area has limited space to expand due to surrounding site constraints, the area to the east of the runway is largely unoccupied. This alternative takes advantage of this area by proposing a new terminal area located on a near-greenfield site, as shown in **Figure 4-3**. An angled taxiway would attach to the Runway 34 threshold to provide indirect access to the runway. The southern section of the proposed apron would be reserved for box hangars and aircraft parking. This would allow a future FBO to be located near the aircraft and vehicle parking area while smaller piston-powered aircraft would be based further north. Although this site offers few facility constraints, it would introduce several operational difficulties. Primarily, this alternative would require aircraft to often cross the runway while utilizing the Airport. Traffic using the parallel taxiway would be required to cross the runway to reach the new building area. Additionally, aircraft based on the east side of the runway would be required to cross the runway to reach the self-service fuel. As there is not a parallel taxiway on the eastern side of the runway, aircraft would have a single entry and exit point to the runway, which would create a bottleneck. Finally, there is an existing NDB in this location that would need to be removed before this alternative would be feasible. Although this alternative is attractive due to the relative lack of site constraints in this area, the operational issues it would introduce and comparative cost of construction outweighs these advantages.

4.1.3 Alternative 3: Reconfigure Facilities

As previously stated, the existing building configuration makes expansion difficult as various buildings are oriented differently. This alternative would align most buildings along a common axis to make more efficient use of the existing space. This would be done in two stages. The first stage is shown in **Figure 4-4**. The parallel taxiway would be extended by approximately 200 feet to sever the direct access from the apron to the runway and allow aircraft to enter and exit the area. Similar to Alternative 1, the existing runup pad would also be removed and marked to prevent use in the interim. As this layout would provide only a single entry and exit point, sufficient room would be provided to maneuver around aircraft that may be positioned at the self-service fueling area. This means there would be at least 172.5 feet from the fueling tank to aircraft parking to provide sufficient space for both the 115-foot taxilane object free area and the 57.5 feet required from a taxilane centerline to a fixed or movable object.

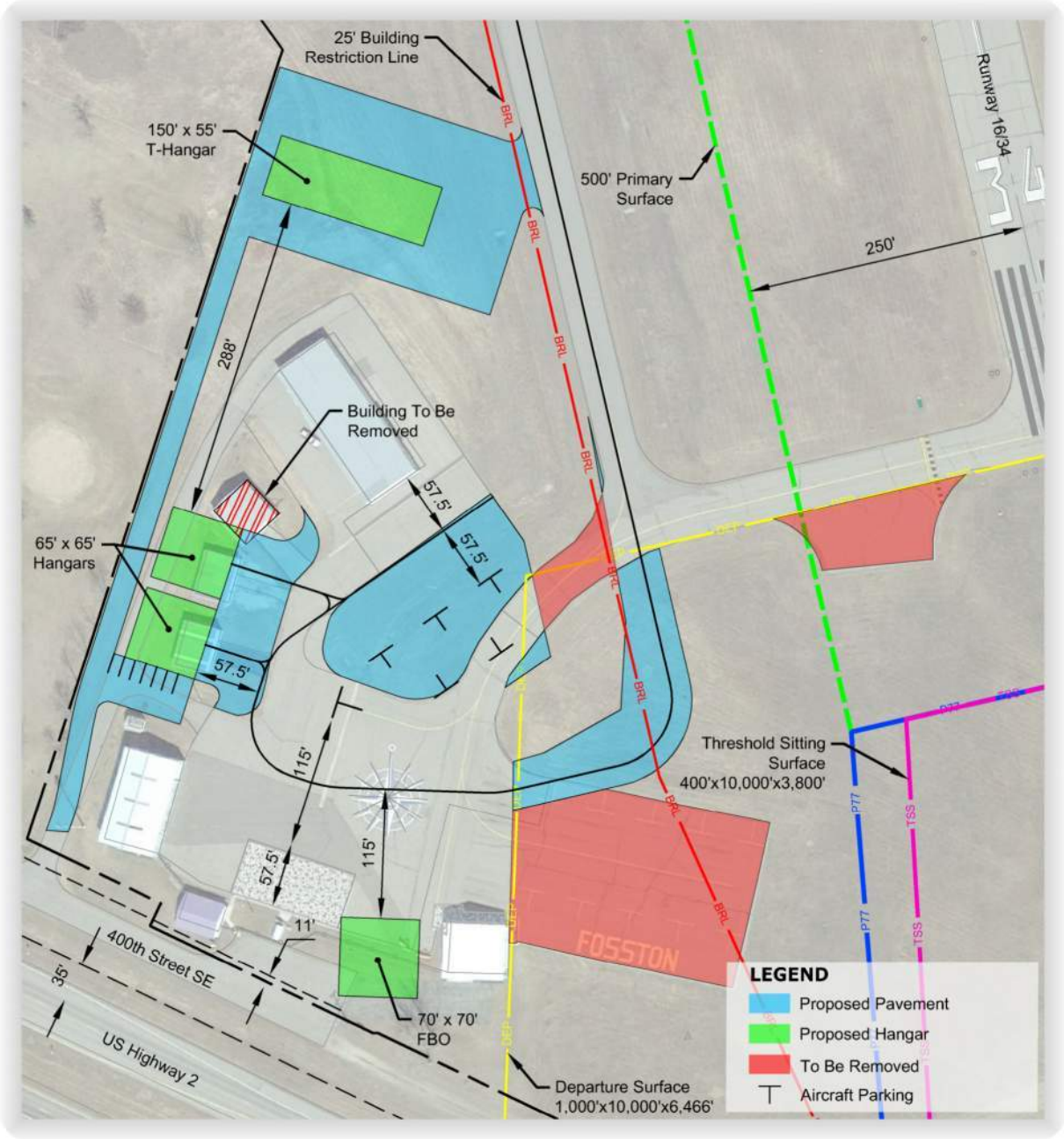
Hangar construction would be phased to provide continuous capacity for existing users. A T-hangar would be constructed to the north and users in the individual hangars could relocate to new hangars before existing hangars are removed. Box hangars would then be constructed in this area and supported by an FBO to the west of the SRE building. This configuration would center larger aircraft, which usually prefer box hangars, further south and near the Airport entrance. This prominent position would likely be attractive to business users and provide separation between piston and turbine users. Construction in this area would remain outside of the U.S. Highway 2 clearway, which is measured at the edge of the through-travel lane and is 35 feet based on clearways specified in the MnDOT Roadway Design Manual. Construction would also not interfere with the 11-foot clearway for 400th Street SE. The ultimate condition for this alternative is shown in **Figure 4-5**.



0 200 400 600
Graphic Scale in Feet

Figure 4-3: **Alternate 2: East Greenfield Site**

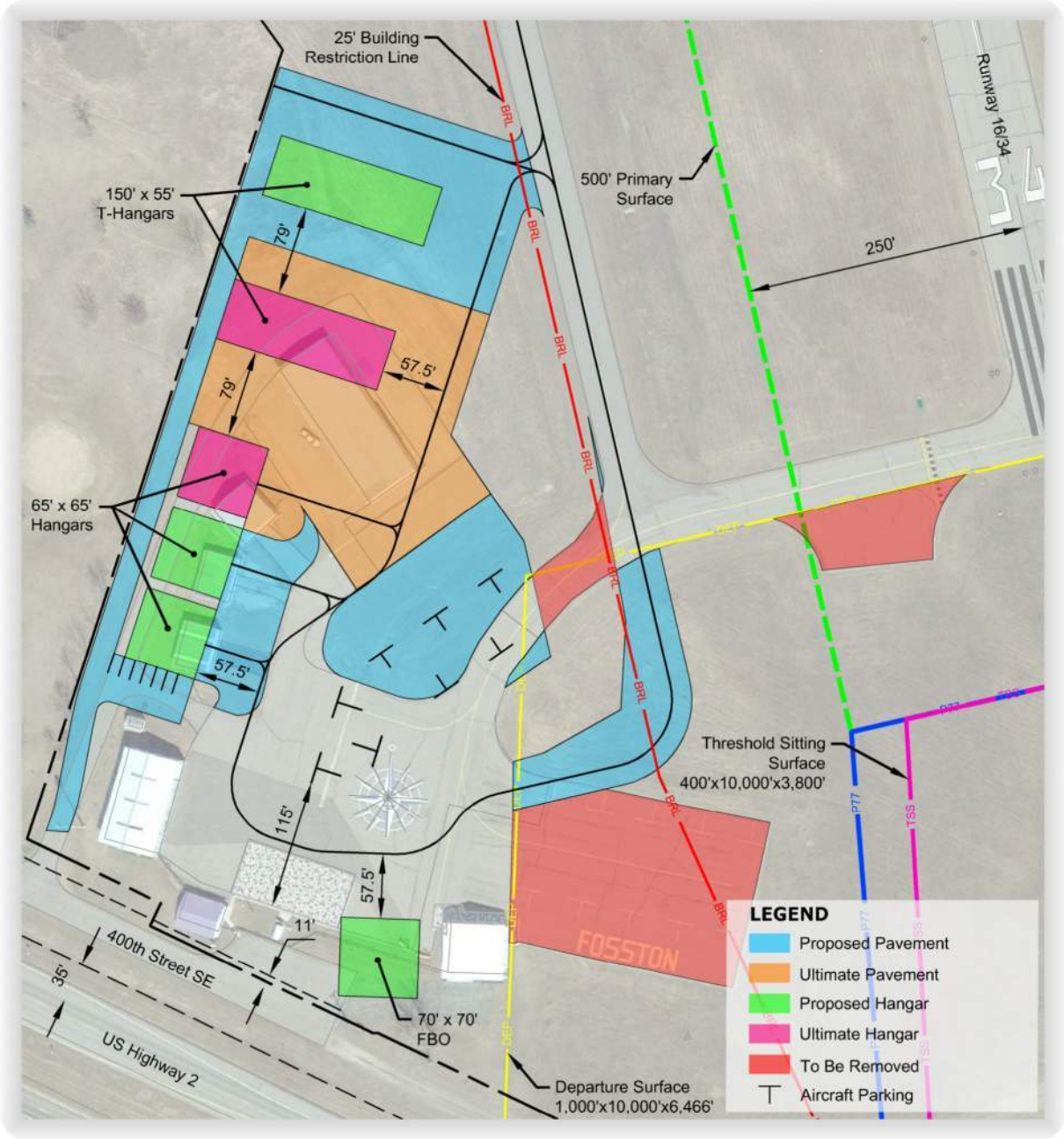
Source: *Polk County, Minnesota Open Data Portal, Google Maps*



0 75 150 225
Graphic Scale in Feet

Figure 4-4: **Alternate 3: Near-Term Layout**

Source: *Polk County, Minnesota Open Data Portal, Google Maps*



0 75 150 225
Graphic Scale in Feet

Figure 4-5: **Alternate 3: Ultimate Layout**

Source: *Polk County, Minnesota Open Data Portal, Google Maps*

By either relocating the existing T-hangar or replacing it at the end of its life in alignment with the other new hangars, enough room would be created to construct an additional box hangar and complete a taxilane through the area. This taxilane would allow aircraft to circulate more freely and provide a second entrance and exit point from the apron.

This alternative would improve the building layout over time by realigning the building area and adding an FBO in a prominent location. However, while this layout would be sufficient during typical levels of activity busy periods may lead to congestion, as there are limited areas for aircraft to reverse direction or stop temporarily. Finally, the taxiway configuration is not ideal as aircraft would pass under the departure surface when circulating through the area.

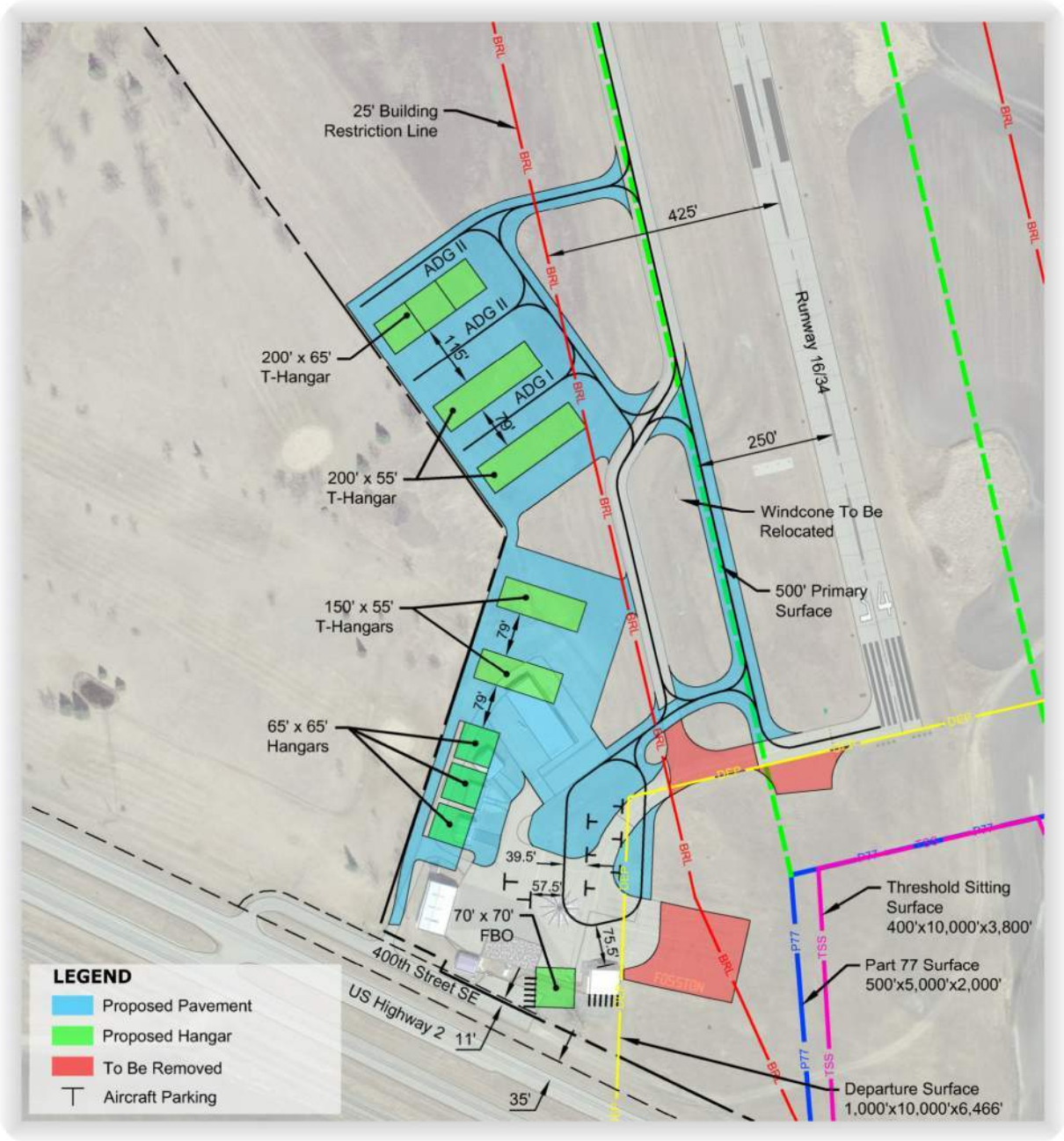
The completion of the taxilane to provide circulation to the apron in either direction would mean the 57.5 feet reserved for fueling aircraft could be eliminated and parking could be expanded for large aircraft. This would support business aviation by allowing parking close to the FBO, fueling area, and other box hangars. Meanwhile, small GA aircraft would have access to the taxiway and runway without interference from large aircraft. In summary, this alternative would phase construction so capacity is not reduced while efficient use of the space is improved.

4.1.4 Alternative 4: Preferred Alternative

The preferred alternative draws on elements from the previous alternatives to phase construction in a way that will resolve existing issues, expand airport capacity, and improve the long-term efficiency of the Airport. This alternative is shown in **Figure 4-6**. The apron would be reconfigured to relocate aircraft parking outside the departure surface while improving circulation in this area for easy access to aircraft fueling and tenant hangars. This would prevent parked aircraft from penetrating the departure surface. A portion of the existing apron that extends into the departure surface would be removed to reduce extra pavement maintenance and access within the departure surface, while also preserving access to the SRE building. A taxiway extension would provide a full-length parallel taxiway while correcting the existing direct apron to runway connection. Severing the direct apron to taxiway connection and removing the existing runup pad would be done in conjunction with the taxiway reconfiguration or when the existing apron near the SRE facility is partially removed, whichever comes first. In the interim, the runup pad would be marked to prevent use by aircraft, as in other alternatives. Relocating the apron to taxiway connection further to the north would also prevent excessively tight turns for larger aircraft when taxiing to the runway.

The construction of additional T-hangars to the north of existing facilities would meet existing and forecasted demand while providing new facilities for existing tenants to relocate to, if desired. Construction would include two T-hangars and one joined box hangar for larger aircraft, such as multi-engine or turbine aircraft. These hangars would meet projected demand while accommodating the anticipated fleet mix, as turbine aircraft are anticipated to become more common. The construction of an additional hangar for an FBO near the existing SRE building would provide a prominent location near the fueling area with a large area for aircraft parking nearby and two additional parking spaces for large aircraft.

This alternative also replaces the existing hangars with an additional T-hangar and three box hangars as the existing hangars in this location begin to exceed their useful life. Locating independent box hangars near the Airport entrance and FBO would create an appealing presence for business jet aircraft and provide dedicated parking for local businesses with a presence on the Airport. Realigning the access road and the southern hangars on a single axis would make more efficient use of the existing space.



0 150 300 450
Graphic Scale in Feet

Figure 4-6: **Alternate 4: Ultimate Layout**

Source: *Polk County, Minnesota Open Data Portal, Google Maps*

4.2 Conclusion

Changing the existing landside facilities layout would correct existing issues while also creating a more efficient footprint. Building replacements could be done as the existing buildings reach the end of their useful life so the transition to the new layout does not place an unnecessary burden on existing tenants. As additional activity at the Airport increases and turbine aircraft become more common it is recommended that airside facility needs be revisited to ensure runway length, instrument approaches, and navigational aids continue to support user needs.

5 Chapter 5: Capital Improvement Plan

Keeping a current Capital Improvement Plan (CIP) that accurately reflects the anticipated expense and timing of upcoming projects is crucial for any publicly funded airport. Projects must be listed on the CIP in order to be eligible for funding. In Minnesota there are 135 publicly funded airports in the state and 97 federally funded airports. The CIP allows projects to be reviewed and funding distributed to airports based on priority. The CIP for the Fosston Municipal Airport (FSE) is shown in **Table 5-1**.

Table 5-1: FSE Five-Year CIP				
Fiscal Year	**Federal**	**State**	**Local**	**Total**
2020 (FFY 2019)				
Snow Removal Equipment	**$162,000**	**$9,000**	**$9,000**	**$180,000**
FY Total	**$162,000**	**$9,000**	**$9,000**	**$180,000**
Use $120k carryover entitlements plus $150k of FFY 2019 entitlements. Carry $90k into FFY 2020				
2021 (FFY 2020)				
Mitigate and Remove Wetlands	**$135,000**	**$7,500**	**$7,500**	**$150,000**
FY Total	**$135,000**	**$7,500**	**$7,500**	**$150,000**
Use $90k carryover entitlements plus $150k of FFY 2020 entitlements. Carry $90k into FFY 2021				
2022 (FFY 2021)				
Hangar/Taxilane Site Work	**$216,000**	**$12,000**	**$12,000**	**$240,000**
FY Total	**$216,000**	**$12,000**	**$12,000**	**$240,000**
Use $90k carryover entitlements plus $150k FFY 2021 entitlements Carry $0 into FFY 2022.				
2023 (FFY 2022)				
Mill & Overlay Runway	**$697,500**	**$38,750**	**$38,750**	**$775,000**
Apron Circulation Area	**$270,000**	**$15,000**	**$15,000**	**$300,000**
Remove Bituminous Pavement in Safety Zones	**$70,200**	**$3,900**	**$3,900**	**$78,000**
Wildlife Fence	**$900,000**	**$50,000**	**$50,000**	**$1,000,000**
FY Total	**$1,937,700**	**$107,650**	**$107,650**	**$2,153,000**
Use both entitlement and discretionary funds. Entitlements: $150k. Discretionary Request: $2,003,000				
2024 (FFY 2023)				
Airport Utilities	**$0**	**$0**	**$200,000**	**$200,000**
FY Total	**$0**	**$0**	**$200,000**	**$200,000**
Use annual entitlements of $0. Carry $150k into FFY 2023				
Grand Total	**$2,450,700**	**$136,150**	**$336,150**	**$2,923,000**

5.1 CIP General Outline

The projects shown in **Table 5-1** are based on needs determined throughout the previous sections of this narrative report. The most immediate projects is acquisition of SRE equipment and the infill of and off-site mitigation for the wetlands near the runway. Other noteworthy projects include the mill and overlay of the

runway and the reconfiguration of the main apron. This reconfiguration will allow for removal of the aircraft parking and runup pad in the departure surface, while also improving circulation. Hangar site development will also be included in the five-year period.

5.2 Annual Project Descriptions

Part of any planning effort should include a more detailed description of the scope of anticipated projects. This assists in ensuring that needs are met and projects are completed in a complementary fashion. The remainder of this section provides additional details on each project divided by year.

5.2.1 State FY 2020 (FFY 2019)

The replacement of the SRE tractor and snow blower would occur this year.

5.2.2 State FY 2021 (FFY 2020)

The wetland infill project would include the filling and mitigationl filling of two wetlands located on Airport property. The affected wetlands are east of the runway and would be filled to minimize wildlife hazards. Wetland mitigation would occur off-site.

5.2.3 State FY 2022 (FFY 2021)

The hangar/taxilane site work project would include preparing the site of the southernmost hangar of the new north hangar development area for future construction, which would include grading and installing necessary utilities. Taxilane preparation includes site work for the taxilanes around these future hangars.

5.2.4 State FY 2023 (FFY 2022)

The apron circulation area project would include reconfiguration of the existing apron to add additional pavement and provide designated circulation around relocated aircraft parking. This relocated parking area would be designed with six tie downs for smaller single engine aircraft and two additional tie downs on the western portion of the apron for larger multiengine turbine aircraft. Pavement removal for this year would include the existing aircraft parking area and the existing runup pad near the Runway 34 threshold, as both areas are located in the departure surface for Runway 16. One is positioned near the midpoint of the parallel taxiway and the two remaining areas are located to the east of the runway. This year would also include the design for and project work for the mill and overlay of the existing runway. Finally, the wildlife fence, as depicted on the ALP, would be installed this year.

5.2.5 State FY 2024 (FFY 2023)

This year would include the Airport water and sewer being connected to the nearby city of Fosston using local funds.

5.3 Funding Summary

The Airport is classified as a basic GA airport according to the FAA NPIAS and is allotted $150,000 annual entitlement funds by the FAA. Projects that will require additional funding from the FAA will be reliant on discretionary FAA funding as well as support from the State of Minnesota and local government sources. As discretionary funding is distributed on a priority basis this means that the proposed projects at FSE will need to be submitted to the FAA for consideration. Funding future projects also considers the utilization and saving of entitlement funds as noted in each year of **Table 5-1**.

United States Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services
34912 U.S. Hwy. 2
Grand Rapids, MN 55744
218-327-3350
218-326-7039 fax

Wildlife Hazard Site Visit

Chuck Lucken
City Administrator/Airport Manager
Fosston Municipal Airport
220 East First Street
Fosston, MN 56542

Date: 6/23/2017

RE: Fosston Municipal Airport Wildlife Hazard Site Visit

Dear Mr. Lucken,

Thank you for the opportunity to assist you in your efforts to reduce wildlife-related hazards at the Fosston Municipal Airport (KFSE). Identifying and addressing potential wildlife-related hazards should be an essential component of airport operations.

Wildlife Hazard Site Visits are conducted for a variety of reasons, including the evaluation of current wildlife hazard management programs, to provide guidance for future wildlife hazard management program efforts, as justification for funding requests, or as preparation for airport improvement or construction projects.

Prior to conducting the WHSV at the Fosston Municipal Airport, I reviewed relevant information to gain familiarity with the airport and surrounding areas. This included reviewing recent aerial photographs of the area, which provide an overall view of the airport property in relation to its natural surroundings and human-made facilities that may serve as wildlife attractants, reviewing past migratory bird depredation permit data, and checking the Federal Aviation Administration's (FAA) Wildlife Hazard Strike Database for any recorded strike data for FSE.

Wildlife numbers and movement patterns vary seasonally and by location. It is important to point out that it is difficult, if not impossible, to make a thorough evaluation of the wildlife hazards that may be present at KFSE throughout the entire year based on a 2-day site visit. However, based on existing habitat conditions on the airport, observations of current wildlife use on and around the airport, knowledge of wildlife migration, movement and behavior patterns, and interviews with pilots, tenants, and airport staff, this evaluation should provide a good general overview of wildlife hazard concerns at the Fosston Municipal Airport.

Beginning Tuesday, May 23rd, Wildlife Services (WS) conducted a 2-day Wildlife Hazard Site Visit at the Fosston Municipal Airport. This included conducting daytime wildlife surveys in the morning, at mid-day, and in the evening to observe and record wildlife sightings, wildlife sign, and habitat use on and around the airport property. After dark, a night-time wildlife survey, using both spotlight and a FLIR (Forward Looking Infrared) unit, was conducted to observe night-time wildlife activity on and around the airport property.

Please note that the recommendations made throughout this report are made strictly from a wildlife-hazard perspective and are not based on the economic feasibility of implementing the recommendations. The airport must make the determination as to the feasibility of

incorporating these recommendations based on their regulatory obligations and financial constraints.

Deer and Other Mammals

As with many unfenced general aviation airports, white-tailed deer appear to be a significant wildlife hazard-related threat at the Fosston Municipal Airport. The most recent FAA/USDA report of Wildlife Strikes to Civil Aircraft in the United States indicates that white-tailed deer were involved in 28% of all documented terrestrial mammal strikes from 1990-2015, with 84% of white-tailed deer strikes causing damage to the aircraft. This demonstrates that nationally, deer pose a significant threat to both human and aircraft safety when they can access Aircraft Operating Areas (AOA).

No deer were observed on the Fosston Airport AOA during the daylight or night time spotlight/FLIR wildlife surveys. However, during the nighttime spotlight/FLIR survey, 3 deer were observed near the tree line of the plowed wheat field north of the airport. Deer tracks were also documented in fields and on the gravel roads outside of airport property. These observations reinforce the assumption that deer appear present a significant potential threat to air operations at KFSE.

The only other mammal observed during this site visit was a coyote that ran out of the southernmost wetland on the east side of runway 16-34 during the morning wildlife survey. The coyote ran across the runway and taxiway, then ran into the trees between the airfield and Ouff Lake. No other mammals were observed during the wildlife surveys, but there were tracks of both coyotes, red fox, striped skunk, and raccoon in the plowed wheat fields adjacent to the airfield. There were also fresh gopher mounds in several areas around the airfield.

Small mammals, such as mice, voles, gophers, ground squirrels, and rabbits, are not generally considered direct wildlife hazards but they do attract larger wildlife such as coyotes, fox, and birds of prey, such as hawks, eagles, and owls, which do pose potential strike hazards. Although no small mammals were observed during wildlife surveys, it should be noted that most of the vegetation on-site was too dense to readily detect small mammals during surveys. It should be assumed that small mammals are common on and around the airport and serve as one of the primary attractants of the raptors, coyote and fox that were determined to be present based on direct sightings and sign observed during our visit.

To minimize the risk of aircraft-deer/mammal strikes, the installation of a chain link or woven wire fence to completely enclose the AOA at the Fosston Municipal Airport is recommended. The FAA recommends a 10-12 foot chain-link fence topped with 3-strand barbed wire outriggers to minimize deer accessing aircraft movement areas. In some cases an 8-foot chain link fence with 3-strand barbed wire outriggers may be sufficient to prevent most deer access to these areas. A 4 foot apron or skirt may also be buried along the outside of the fence to further exclude digging mammals, such as coyotes, foxes, and skunks, and to help prevent gaps forming under the fence due to frost heaving. Buried aprons may also reduce the chance of washouts. The fence should also enclose as little wildlife cover (trees, brush, tall vegetation, and wetlands) as possible. Wildlife Services also recommends against using the

one-way deer gates that were popular in airport fences in the past, as they are very high maintenance and easily damaged, rendering them ineffective at excluding deer. All gates in the perimeter fence should close with less than 6-inch gaps to prevent deer entry as well. Fence line right-of-ways must be kept free of excess vegetation and monitored frequently for holes, gaps, washouts and breaks and repaired as soon as deficiencies are discovered.

Waterfowl and other Hazardous Birds

According to the most recent USDA/FAA report, birds have been involved in 95.8% of all wildlife strikes to civilian aircraft in the US from 1990 to 2015. The most commonly struck bird groups were doves/pigeons (14%), raptors (13%), gulls (12%), shorebirds (9%), and Waterfowl (6%). Waterfowl, however, because of their large size and flocking behavior, were involved in 29% of all damaging strikes in which the bird type was identified.

Although no waterfowl were observed sitting on the airfield itself, waterfowl should be considered a high hazard at the Fosston Airport due to the airfield's proximity to Ouff Lake, and the tendency of waterfowl to fly across the runway coming or going from the lake. The waterfowl hazard is compounded by the two wetlands on the east side of the runway because waterfowl flying between the wetlands and the lake fly directly across runway 16-34 at low elevation. Any waterfowl nesting in those wetlands have easy access to the adjacent airfield for feeding in the short grass of the airfield.

Several species of waterfowl were observed during wildlife surveys at KFSE, including Canada geese, mallards, hooded mergansers, and blue-winged teal. Waterfowl observations were primarily associated with Ouff Lake, near the north end of runway 16-34. A pair of mallards were observed flying across the runway after leaving Ouff Lake, and landing at the edge of one of the small wetlands on the east side of the airfield. A flock of 13 Canada geese were observed during a survey just after sunrise, as they left the lake where they had roosted for the night, and flew east across the approach end of the runway.

In addition to the waterfowl listed, several other bird species were observed on and around the airfield, including red-tailed hawks, American crows, American robins, red-winged and Brewer's blackbirds, European starlings, mourning doves, killdeer, horned larks, tree swallows, and several sparrow species. A complete list of all wildlife observed at KFSE can be found on Page 9.

Blackbirds (red-winged and Brewer's) should also be considered a high hazard to aviation safety at KFSE. Blackbirds fly back and forth across the runway between the cattail marshes along the shore of Ouff Lake and the two marshy areas on the east side of the runway. These areas provide blackbirds with easy access to food in the short grass areas of the airfield and nearby agricultural fields. The Fosston Airport is located in a large agricultural area of the state. During fall migration, large flocks of blackbirds form and migrate through this agricultural area. The proximity of KFSE to agricultural fields, the cattail marshes around Ouff Lake, and the wetland areas east of the runway serve as hazardous attractants for blackbirds and other birds during the spring and fall migratory seasons.

Threatened and Endangered Species

The presence of state or federally listed threatened or endangered (T/E) species on or near the airport environment is important because of the potential impacts of a wildlife hazard management program. Threatened or endangered species are protected from removal, hazing, and even indirect actions that affect their habitat. It is important for the airport to understand the status of these species and take steps to avoid adversely affecting them during wildlife hazard management activities. No state or federally listed (endangered, threatened, species of concern) birds or mammals were observed at KFSE during the surveys for this site visit. Current state and federally listed T/E species that are known to occur in Polk County are identified on page 11 of this document. KFSE should contact the USFWS and the Minnesota Department of Natural Resources (MNDNR) regularly for updated lists of these species.

Habitat Modification

Wetlands, in general, are attractive to wildlife because they provide food, water and shelter to a variety of wildlife species. For this reason, WS generally discourages having any type of wetland in close proximity to the AOA on an airport, and strongly discourages having wetlands within the AOA.

To minimize wildlife hazards at the Fosston Airport, the two wetland areas adjacent to the airfield on the east side of runway 16-34, should be considered for removal. These wetlands were also addressed in a report from a 2008 Wildlife Services site visit to the Fosston Airport:

"The vegetation in the wetlands consisted primarily of marsh grasses and herbaceous vegetation 2 to 3 feet tall, and cattails 4 to 5 feet tall. There was also some woody vegetation and small trees on the edge of two of these wetlands. All of this vegetation provides cover for wildlife, including many species of birds and mammals. The cattail marshes are large enough to provide cover for medium to large mammals such as coyotes and deer. Having these cattail marshes such a short distance from the runway creates a highly hazardous situation. Deer, coyotes, waterfowl, shorebirds, and other wildlife using these areas for cover could easily be spooked by aircraft taking off or landing. Due to the short separation distance of the wetlands from the runway, pilots would have very little reaction time to avoid striking wildlife running or flying across the runway. This is especially true for the 3 wetlands on the east side of the runway. The closest natural cover for animals, such as deer and coyotes using these wetlands is the vegetation along the edge of Ouff Lake to the west. Deer and coyotes startled out of the 3 east wetlands would likely cross the AOA to get to the cover along the lake. There would also likely be some natural movement of waterfowl and shorebirds across the AOA as they fly between the lake and the eastern wetlands, posing a hazard to aircraft on the ground during take-off and landing, and in the air during approach and departure.

The federal Aviation Administration addresses existing wetlands on or near airports in Section 2-4 of Advisory Circular 150/5200-33b. This Advisory Circular states:

> "At public-use airports, the FAA recommends immediately correcting, in cooperation with local, state, and Federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports."

Although "correcting" the wildlife hazard doesn't necessarily mean removing the wetlands, in the situation at the Fosston airport, removal of the wetlands should be considered. Any fencing between the wetlands and the runway, or around the wetlands may prevent most mammal access to the airfield but would not prevent the hazards associated with birds utilizing these wetlands as they can fly over the fencing. In the long term, removal of the wetlands and installation of a perimeter fence would likely reduce the wildlife hazards to the greatest extent."

Grass height in the AOA should be maintained at an appropriate length (7-10 inches). The grass should be mowed before seed heads develop and become a food attractant for many hazardous wildlife species. Short grass management also reduces the cover for many wildlife species (e.g. rodents and white-tailed deer).

Airport management authorities generally have little control over off-site wildlife attractants near the airport. In this case, however, the city of Fosston owns the airport itself, the nearby municipal golf course, and some of the agricultural fields adjacent to the airfield. This may provide the airport with some opportunity to manage wildlife hazards in the area immediately surrounding the airport.

The agricultural fields adjacent to the airfield were primarily planted in wheat when the Wildlife Hazard Site Visit was conducted. This may vary from year to year as crop rotation schedules are followed. Other agricultural crops in the area consist of corn, soybeans, oats, hay, and sunflowers. While they may not serve as a year round attractant for hazardous wildlife, the agriculture fields will seasonally attract several species of wildlife potentially hazardous to aviation.

Airport authorities should work with agricultural lessees to try to utilize crops that are less attractive to wildlife when possible. All crop fields adjacent to the KFSE should be tilled or turned-over immediately following harvest to prevent waterfowl and other hazardous wildlife from foraging on waste crops or residue. Harvest residue and spillage are very attractive to many species of wildlife. Immediately tilling the soil following harvest buries this residue, making it less attractive to wildlife.

<u>Training</u>

All personnel that have duties requiring access to the AOA should be trained to recognize and respond to potential wildlife hazards appropriately. Every employee that might encounter wildlife hazards at the airfield should be made aware of their responsibility to recognize, respond to, and report wildlife hazards. Employees should be familiar with damage caused by wildlife and how to respond to potentially hazardous situations.

Employees should be trained to identify common wildlife species found at KFSE and made

aware of their relative risk to aviation safety. A field guide is very useful for achieving this goal and should be made readily available to those who may need it. There are many good, relatively inexpensive, bird field guides that are easy to use that may be purchased on line or at a local bookstore.

If airport personnel are unable to identify the wildlife species they encounter, they may contact WS for assistance. It is also extremely important/useful to identify and report all strikes, even the smallest of birds that occur at KFSE. Any wildlife remains suspected in a strike related incident that cannot be identified should be placed in a sealed plastic bag and stored in a freezer. The feathers (breast, wing, and tail), along with photographs of the carcass, if possible, should be sent to the following address as soon as possible following their collection: Feather Identification Lab, Smithsonian Institute National Museum of Natural History, E600, MRC116, P.O. Box 37012, Washington, D.C. 20013-7012 for positive identification. Additional information can be useful to record, such as the location of carcass relative to the runway (e.g. 1,000-foot marker of Runway 32), predominant runway in use during the time of incident, and nature of strikes (e.g. reported by pilot, found during a runway sweep, found during mechanical inspection, etc.), and the name and telephone number of a contact person at the airport. WS may also be contacted to assist in the reporting of suspected strikes at KFSE.

All personnel should also be trained in the safe handling and effective use of hazing devices such as pyrotechnics to avoid creating a more hazardous situation (e.g. chasing birds into the path of an approaching aircraft). WS offers a training course designed to familiarize airport personnel with basic bird identification, dispersal techniques and their safe application.

Wildlife Activity Log

Fosston Municipal Airport staff should establish and maintain a wildlife activity log containing daily records of wildlife dispersal and control efforts. Keeping a record of control activities on the airfield provides a useful index of wildlife abundance and use of the airfield over time. The information gained by maintaining these records enables airport staff to monitor the effectiveness of different methods. Thorough records also provide a degree of protection to the airport in the event of litigation related to a damaging wildlife strike, especially if injury or death results. The minimum amount of information recorded should include the person conducting the action, date, time, species involved, number of animals, location on the airfield, and control methods used. It would also be useful to document the animal's response to the control action (e.g. abandoned airfield, flew to another area, etc.). A standardized form (see attachment) simplifies the recording of actions or observations. If no wildlife is observed during a routine airfield patrol, that is useful information as well and it should still be documented that a patrol was conducted, even if no wildlife is encountered.

Records of actions are most easily maintained in a computer database because the data can be easily extracted or sorted into a presentable report of graphical format. Without accurate records, it may be difficult or impossible to justify and defend certain management actions such as wildlife removal or to defend the airport during litigation in the aftermath of a damaging wildlife strike. WS can assist the airport with setting up a computer database for

use in the compilation and interpretation of wildlife control (including non-lethal hazing actions) data.

Wildlife Harassment/Hazing

Once birds become established in the area, they become harder to disperse, especially if they begin nesting. Flocking birds such as ducks, geese, gulls, and starlings are readily attracted to individuals or flocks of birds already present, resulting in a dramatic increase in the number of birds on the airfield in a short period of time. To prevent this decoying effect, all birds should be scared or hazed off the airfield immediately upon arrival and not allowed to nest, feed, or loaf on the airfield.

During migration periods, particularly April – May and September - October, the frequency of hazing patrols should be increased because migratory birds are unaware of the "off-limits" nature of the airfield and will attempt to land. Propane exploders and other static deterrents may be applied during these short-term periods of migration to discourage transient birds from landing on the airfield in the first place. It should be noted that static devices such as propane exploders, distress calls, and raptor silhouettes/kites lose their effectiveness if not frequently moved or augmented with pyrotechnics or lethal control. For this reason, these deterrents are typically directed at migratory birds just passing through the area.

No federal or state permits are required to harass or haze wildlife (except bald/golden eagles and threatened or endangered species). A robust wildlife harassment program should consist of some form of pyrotechnics or audible pest control devices to prevent wildlife habituation with other methods of harassment. Several vendors supply the industry with wildlife pyrotechnics. A list of these distributors is attached.

Lethal Control

The lethal control of hazardous wildlife is used widely in the aviation industry to protect human health and safety. Lethal control is used sparingly to reinforce non-lethal harassment and to prevent wildlife from habituating to the airport environment.

Although lethal control is not considered a stand-alone solution for wildlife management at airports, the lethal removal of a limited number of birds and mammals may be useful to augment non-lethal methods to prevent hazardous wildlife that may be persistently attempting to access the airfield.

Permits to lethally remove white-tailed deer and most other state managed mammals can be obtained from the Minnesota Department of Natural Resources (MN DNR). These Depredation Permits are available to remove state protected wildlife to protect human health and safety, including aviation. Some mammals, such as coyotes, porcupines, and striped skunks are not protected and no permit is required to lethally remove them. Several other mammal species can be removed without a permit when they are doing damage. State permits do not allow the take of federally threatened or endangered species, such a gray wolves or Canada lynx. Because the protected status of species may change, airport managers/staff

should consult with the appropriate state or federal agency to determine if a permit is needed to conduct lethal control of the species of interest.

Migratory birds are protected by federal statute under the migratory Bird Treaty Act, and state statutes enforced by the MN DNR. The lethal removal of most migratory birds requires a Federal Migratory Bird Depredation Permit obtainable from the U. S. Fish and Wildlife Service and a State permit from the MN DNR. There are some unprotected migratory birds, such as English sparrows, European starlings, and rock doves for which no Federal or state permit is required for lethal removal. The depredation permits issued by the MN DNR and the U.S. Fish and Wildlife Service are both renewable and have annual reporting requirements. Again, because the protected status of species may change, airport managers/staff should annually consult with the appropriate state or federal agency to determine if a permit is needed to conduct lethal control of the species of interest.

Carcasses of birds and/or mammals should not be left on the airfield as they tend to attract scavengers, such as coyotes, foxes, crows, turkey vultures, and bald eagles, which increases the risk of strikes of these species by aircraft.

Conclusions

The recommendations made below and throughout this report are made strictly from a wildlife-hazard perspective and are not based on the economic feasibility of implementing the recommendations. The airport must make the determination as to the feasibility of incorporating these recommendations based on their regulatory obligations and financial constraints. With that in mind, WS recommends the Fosston Municipal Airport:

1) Construct a perimeter fence (minimum 8 ft. height) around the entire airfield to prevent access by large mammals such white-tailed deer.

2) Remove/fill the two small wetlands on the east side of the airfield.

3) Work with agricultural lessees to try to utilize crops which may be less attractive to hazardous wildlife species. Till and turn over any remaining residual crop in the agricultural fields on KFSE/city property as soon as possible following harvest.

4) Acquire and utilize pyrotechnics and/or other equipment to haze/harass wildlife on the airfield, on city-owned agricultural land and the municipal golf course. A list of vendors and basic equipment is provided.

5) Apply for and annually renew migratory bird and mammal depredation permits to allow for the integration of lethal control to augment non-lethal methods as part of a wildlife hazard mitigation program.

6) Incorporate a wildlife activity log to track and document ALL wildlife mitigation strategies. An example is provided.

7) Document any wildlife strikes that occur at FSE in the FAA/USDA National Wildlife Strike Database.

8) Develop a Wildlife Hazard Management Plan.

Please feel free to contact WS regarding any questions pertaining to this report or for further assistance on wildlife hazard related issues at the Fosston Municipal Airport.

Sincerely

Duane (Pete) Sahr
Wildlife Biologist

cc:
K. Kinnen, Karvakko, Bemidji, MN
G. Nohrenberg, USDA-WS, St. Paul, MN

Airport sponsor/representative signature concurrence with findings:

_____

Chuck Lucken Date
City Administrator/Airport Manager

List of All Wildlife Species Observed at FSE during Wildlife Hazard Site Visit:

Birds:

Common Name	Scientific Name
American crow	*Corvus brachyrhyncos*
American robin	*Turdus migratorious*
blue-winged teal	*Anas discors*
Brewer's blackbird	*Euphagus cyanocephalus*
Canada goose	*Branta canadensis*
European starling	*Sturnus vulgaris*
hooded merganser	*Lophodytes cucullatus*
horned lark	*Eremophila alpestris*
killdeer	*Charadrius vociferous*
mallard	*Anas platyrhynchos*
mourning dove	*Zenaida macroura*
red-tailed hawks	*Buteo jamaicensis*
red-winged blackbird	*Agelaius phoeniceus*
tree swallow	*Tachycineta bicolor*
sparrows	multiple species

Mammals

Common Name	Scientific Name
Coyote	*Canis latrans*
White-tailed deer	*Odocoileus virginianus*

List of State and Federal and State threatened and endangered species in Polk County, MN

Common Name	Scientific Name	Group	Federal	State
A Caddisfly	*Limnephilus secludens*	insect	none	endangered
Annual Skeletonweed	*Shinnersoseris rostrata*	vascular plant	none	threatened
Assiniboia Skipper	*Hesperia assiniboia*	insect	none	endangered
Baird's Sparrow	*Ammodramus bairdii*	bird	none	endangered
Beach Heather	*Hudsonia tomentosa*	vascular plant	none	threatened
Beaked Spikerush	*Eleocharis rostellata*	vascular plant	none	threatened
Burrowing Owl	*Athene cunicularia*	bird	none	endangered
Chestnut-collared Longspur	*Calcarius ornatus*	bird	none	endangered
Clustered Broomrape	*Orobanche fasciculata*	vascular plant	none	threatened
Dakota Skipper	*Hesperia dacotae*	insect	threatened	endangered
Eastern Spotted Skunk	*Spilogale putorius*	mammal	none	threatened
Fluted-shell	*Lasmigona costata*	mussel	none	threatened
Ghost Tiger Beetle	*Cicindela lepida*	insect	none	threatened
Goblin Fern	*Botrychium mormo*	vascular plant	none	threatened
Gray Ragwort	*Packera cana*	vascular plant	none	endangered
Hair-like Beak Rush	*Rhynchospora capillacea*	vascular plant	none	threatened
Handsome Sedge	*Carex formosa*	vascular plant	none	endangered
Indian Ricegrass	*Achnatherum hymenoides*	vascular plant	none	endangered
Loggerhead Shrike	*Lanius ludovicianus*	bird	none	endangered
Louisiana Broomrape	*Orobanche ludoviciana* var. *ludoviciana*	vascular plant	none	threatened
Poweshiek Skipperling	*Oarisma poweshiek*	insect	endangered	endangered
Ram's Head Orchid	*Cypripedium arietinum*	vascular plant	none	threatened
Sandy Tiger Beetle	*Cicindela limbata nympha*	insect	none	endangered
Short Ray Fleabane	*Erigeron lonchophyllus*	vascular plant	none	threatened
Sprague's Pipit	*Anthus spragueii*	bird	none	endangered
Sterile Sedge	*Carex sterilis*	vascular plant	none	threatened
Western Prairie Fringed Orchid	*Platanthera praeclara*	vascular plant	threatened	endangered
Whorled Nutrush	*Scleria verticillata*	vascular plant	none	threatened
Wilson's Phalarope	*Phalaropus tricolor*	bird	none	threatened

Resources

Permits

Mammals
MN DNR Nongame St. Paul or Local Area Wildlife Office
Lori Naumann
651-259-5148
Lori.naumann@state.mn.us

Deer
Area DNR Wildlife Office

Birds
USFWS Migratory Birds Permits Region 3
Jason Mercado
612-713-5421
Jason_mercado@fws.org

http://www.fws.gov/migratorybirds/mbpermits/ApplicationForms.html

FAA Wildlife Mitigation

http://www.faa.gov/airports/airport_safety/wildlife/

Strike Report

http://wildlife.faa.gov/

Pyrotechnics

http://reedjoseph.com/

http://margosupplies.com/public/american1/scare.htm

http://www.wildlifecontrolsupplies.com/removal/WCS2600.html

http://westernwildlifecontrol.com/

https://wildlifems.com/index.php/pyrotechnics.html

http://www.suttonag.com/

Airport Wildlife Log

DATE	SPECIES	LOCATION	HAZED	KILLED	METHOD	COMMENTS
10/12/2014	Canada goose	RWY 18 and B	25		Pyro	**EXAMPLE**

Wetland Delineation Report

Fosston Municipal Airport - Anderson Field Wetland Delineation

FOSSTON

WHERE THE PRAIRIE MEETS THE PINES

July 10, 2019

KARVAKKO

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Certified Wetland Delineator under the laws of the State of Minnesota.

Date: July 10th, 2019

Name: Keith E. Kinnen ID#: 1244

I. Purpose

The purpose of this report is to describe the wetland resources that are within the proposed development area at the Fosston Municipal Airport. A field study was performed by Keith Kinnen of Karvakko P.A. on July 17th, 2018. This report displays the data that was collected both on-site and off-site to determine the boundary between wetland and upland within the potential future expansion area.

II. Overview

Legal Description

The legal description for the project location is Township 148 North, Range 40 West, and Section 32. The project is located in Polk County and it is located at the Fosston Municipal Airport west of Fosston on Highway 2.

General Description of the Area

The site is generally flat with minor slopes conveying water into system of wetlands surrounding Ouff Lake. This area is located approximately 1 mile west of the Fosston in an area primarily used for agriculture. Most of the area is farmed and drainage ditches have been developed to improve farmland. In general water from the area flows northwest into Ouff Lake.

Land Use

The primary use of the area is airport operations for the Fosston Municipal Airport. Adjacent land to the north and east are farmed. Adjacent land to the west is the Fosston Golf Club. Adjacent to the south is US Highway 2. The entire project is located within airport property and carefully managed to ensure safety. Therefore, most of the area is routinely mowed to minimize wildlife and other potential dangers to aircraft operations.

Geology and Soils

The major landforms for Polk County include flats and rises on lake plains, flats and rises on moraines, and depressions. Most of the soils encountered were clay. The soils report indicates Hedman-Fram complex (1142) in the majority of the area with Hamre muck (1878) in the approximate location of the Wetland #3 (See attached soil report). Hedman-Fram complex typically includes fine sandy loams. Hamre muck typically includes muck and sandy clay loam.

There were no fine sandy loams identified during the site visit which is not consistent with the web soil survey. However, mucky and sandy clays were common on site which are consistent with the Hamre muck identified on the web soil survey. Site conditions

suggest the extents of Hamre muck are larger than what is mapped on the web soil survey, and extents of Hedman-Fram complex are less.

Hydrology

Wetlands within the project limits are part of a larger system. Water generally enters the wetlands as runoff from adjacent farmland and/or airport development areas and flows northwest through a series of linear wetlands to Ouff Lake.

Weather and Climate

The day of the site visit, the weather was clear, temperatures were in the mid 70's degrees F with 0-5 mph winds.

Precipitation is considered for three months prior to the date of the delineation. Wet and dry periods have significant impacts to the boundaries of wetlands and therefore need to be considered in conjunction with field conditions. In the project area, antecedent precipitation for the three months preceding the delineation is displayed on the following charts using the Gridded Database.

Minnesota State Climatology Office

State Climatology Office - DNR Division of Ecological and Water Resources University of Minnesota

home | current conditions | journal | past data | summaries | agriculture | other sites | about us

Precipitation Worksheet Using Gridded Database

Precipitation data for target wetland location:	
county: **Polk**	township number: **148N**
township name: **Brandsvold**	range number: **40W**
nearest community: **Fosston**	section number: **32**

Aerial photograph or site visit date:
Tuesday, July 17, 2018

Score using 1981-2010 normal period

values are in inches A 'R' following a monthly total indicates a provisional value derived from radar-based estimates.	first prior month: **June 2018**	second prior month: **May 2018**	third prior month: **April 2018**
estimated precipitation total for this location:	**4.95**	**2.88**	**0.18**
there is a 30% chance this location will have less than:	3.55	2.38	0.99
there is a 30% chance this location will have more than:	5.68	3.39	1.56

type of month: dry normal wet	**normal**	**normal**	**dry**
monthly score	**3 * 2 = 6**	**2 * 2 = 4**	**1 * 1 = 1**
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	**11 (Normal)**		

Conditions are normal for this time of year which was taken into consideration during the delineation.

Vegetation

Historic air photos show the area has been developed as an airport with adjacent agriculture dating back to 1991. Currently, vegetation in the area has been virtually 100 percent manipulated by either farming activities or airport development. Upland areas are primarily Kentucky bluegrass, Perennial Ryegrass and Smooth Brome maintained as airport turf, or actively farmed crops which appeared to be soybean at the time of this delineation. Vegetation in wetland areas is dominated by Cattails and Reed Canarygrass.

III. Methods

Office and Field Techniques

The delineation was conducted utilizing the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region.
The *1987 Corps of Engineers Wetland Delineation Manual* was used for additional guidance.

Prior to delineation aerial photographs, National Wetland Inventory maps and an on-site reconnaissance were used to locate suspected wetlands within the project area. Representative samples were selected in the wetlands to help determine the boundaries of the wetlands. Observation holes were dug in areas where the boundary was questionable in order to clearly determine the location. Several observation holes were dug to determine the wetland boundary but only a portion of the sample areas were recorded on data sheets. Data sheets are located in Attachment 6. The wetland boundary is marked with pink flags. Wood lath with green ribbon marks the sample points. Sample points were recorded using transects and sample points. Each wood lath has a unique identification. The boundaries have been recorded utilizing global positioning equipment.

IV. Results

The data collection was performed on July 17th, 2018. Vegetation was actively growing. Three wetlands were identified on site (See below and Attachment 7: Wetland Delineation Map for more information).

The Technical Evaluation Panel (TEP) met on-site with Mr. Kinnen July 9th, 2019 to review the boundaries. After the meeting, minor revisions were made and this report was finalized.

Detailed information for each of the Sample Points is documented on the data forms in Attachment 6. Section V contains photos of the wetland with descriptions of locations. See Index to Attachments.

Wetland #1			
Location	Between hangar area and taxiway, see figures		
Size	0.20Acres		
USFWS Circular 39 Type(s)	Type 1: Seasonally flooded		
Cowardin	PEM2E		
Eggers & Reed	Seasonally flooded basin		
Dominant Vegetation	Spike Rush, Prairie Chordgrass		
Source of hydrology	Runoff from adjacent pavement areas		
Hydric Soil Indicator	Loamy Mucky Mineral (F1)		
USDA Soil Type(s)	Hedman-Fram complex (1142)		
Consistent with USDA?	No		
NWI Classification(s)	NA		
Consistent with NWI?	Yes, see notes		
Watershed	Red River of the North – Sand Hill River		
Notes	Historically, this was not a wetland. Wetland 1 is a constructed drainage ditch that resulted from a taxiway project. It is located between the hangar development area and the recently constructed taxiway. It receives water from adjacent runoff. Water flows south to north and eventually outlets into Ouff Lake. Primary vegetation in the wetland was Prairie Cordgrass and Spike Rush. The upland areas were primarily Smooth Brome and Kentucky Bluegrass. This entire area is routinely mowed for airport operations. Soils in the wetland were disturbed from ditching activities, but appeared to be the lower profiles of Hamre muck.		

Wetland #2			
Location	South end of runway on east edge, see figures		
Size	1.07Acres		
USFWS Circular 39 Type(s)	Type 1: Seasonally flooded		
Cowardin	PEM1C		
Eggers & Reed	Seasonally flooded basin		
Dominant Vegetation	Prairie Chordgrass, Green Bulrush		
Source of hydrology	Runoff from adjacent farmland		
Hydric Soil Indicator	Loamy Mucky Mineral (F1)		
USDA Soil Type(s)	Hedman-Fram complex (1142)		
Consistent with USDA?	No, soils are more consistent with Hamre muck.		
NWI Classification(s)	None		
Consistent with NWI?	No		
Watershed	Red River of the North – Sand Hill River		
Notes	Wetland 2 is a seasonally flooded basin. It receives water from adjacent runoff. Water flows SE to NW and eventually outlets into Ouff Lake. Primary vegetation in the wetland was Prairie Cordgrass and Green Bulrush. The upland areas were primarily Kentucky Bluegrass and Perennial Ryegrass in airport areas and soybeans in the farmed areas.		

Wetland #3			
Location	Middle of runway on east edge, see figures		
Size	1.52 Acres		
USFWS Circular 39 Type(s)	Type 1: Seasonally flooded		
Cowardin	PEM1C	PEM2A	
Eggers & Reed	Seasonally flooded basin		
Dominant Vegetation	Cattail, Reed Canarygrass		
Source of hydrology	runoff from adjacent farmland		
Hydric Soil Indicator	Loamy Mucky Mineral (F1)		
USDA Soil Type(s)	Hamre muck (1878)	Hedman-Fram complex (1142)	
Consistent with USDA?	Yes		
NWI Classification(s)	PEM1A, R4SBC		
Consistent with NWI?	Yes in 3a, No in 3b Portion 3b is not a riverine wetland		
Watershed	Red River of the North – Sand Hill River		
Notes	Wetland 3 is a seasonally flooded basin. It receives water from adjacent runoff. Water flows SE to NW and eventually outlets into Ouff Lake. Primary vegetation in wetland portion 3a was Cattail in the central area and Reed Canarygrass around the edges. The upland areas were primarily Smooth Brome. Vegetation in wetland portion 3b was sparse. It appeared to have been sprayed with herbicide to prevent growth. Note: Portion 3b of this wetland appears to be a result of farming activities. It appears a swale was developed to improve surrounding farming conditions and the lower (northwest) portion of the swale has developed wetland characteristics.		

V. Site Photos

Photo 1: Wetland 1 from north

Photo 2: Wetland 1 from southwest

Photo 3: Wetland 3 from northwest

Photo 4: Wetland 3 from north

Photo 5: Wetland 2 from southwest

Photo 6: Wetland 2 from northeast

VI. References

- *Federal Register/ Vol. 68, No. 10 Wednesday, January 15, 2003. Proposed Rules. Advance Notice of Proposed Rulemaking on the Clean Water Act Regulatory Definition of "Waters of the United States".*

- *USACE, Corps of Engineers Wetlands Delineation Manual, TY 87-1, January 1987.*

- Midwest Regional Supplement to 1987 Manual – Ver. 2.0, January 2012

- *USDA Web Soil Survey*

- *Pocket Guide to Field Indictors of Hydric Soils in the United States, Adapted from NRCS Field Indicators of Hydric Soils in the United States (Version 7.0, 2010)*

- *BOWSER web site for Minnesota*

- *Chadde, Steven,W; A; Wetland Plants of Minnesota*

- *Eggers, Steve D. and Reed, Donald M.;Wetland Plants and Plant Communities of Minnesota and Wisconsin; Second Edition.*

- *Lawrence Newcomb, Newcomb's Wildflower Guide; Third Edition.*

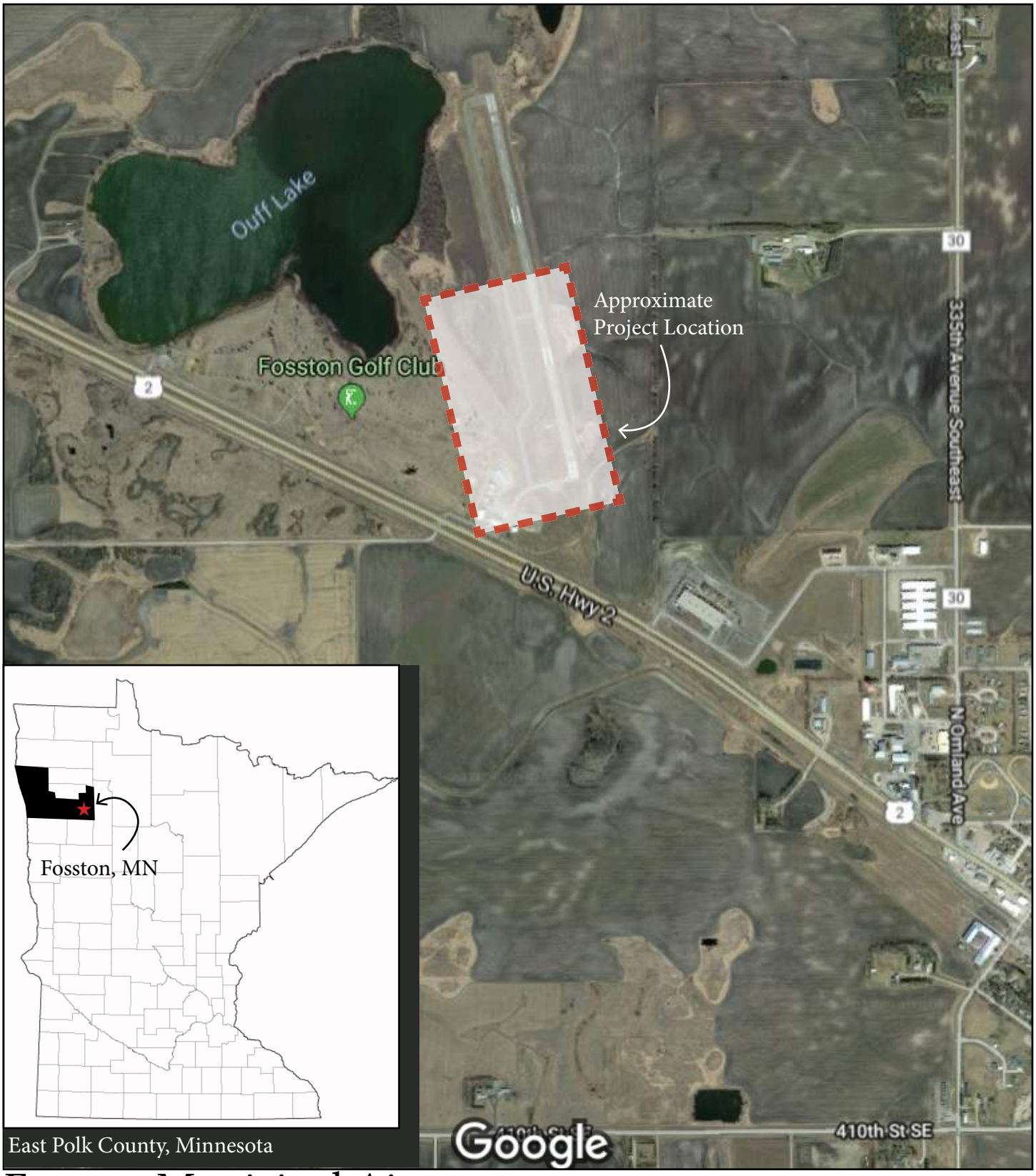
- *State Climatology Office - DNR Division of Ecological and Water Resources University of Minnesota*

V. Index of Attachments

ATTACHMENT 1:	VICINITY MAP
ATTACHMENT 2:	USGS TOPGRAPHIC MAP
ATTACMNENT 3:	AERIAL PHOTOS
ATTACHMENT 4:	NATIONAL WETLAND INVENTORY
ATTACHMENT 5:	SOILS MAP
ATTACHMENT 6:	DATA SHEETS
ATTACHMENT 7:	WETLAND DELINEATION MAP

ATTACHMENT 1

VICINITY MAP



Fosston Municipal Airport - Vicinity Map

Wetland Delineation

Date: July 19th, 2018

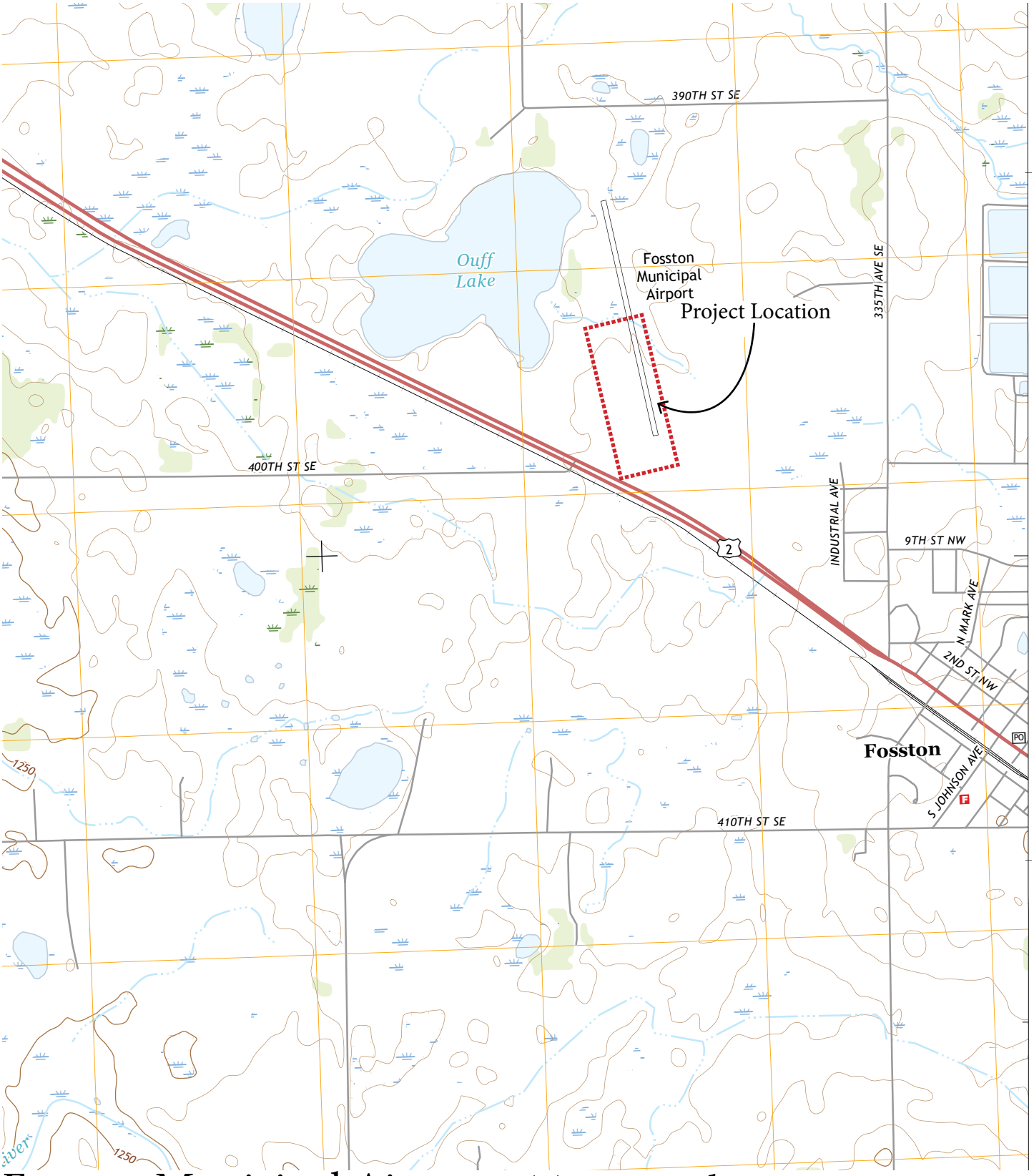
KARVAKKO

NO SCALE

NORTH

ATTACHMENT 2

USGS TOPOGRAPHIC MAP



Fosston Municipal Airport - Topographic Map

(USGS 24K USGS Topo)

Wetland Delineation

Date: July 19th, 2018

KARVAKKO

SCALE

0' 24,000' 48,000'

NORTH

ATTACHMENT 3

AERIAL PHOTOS

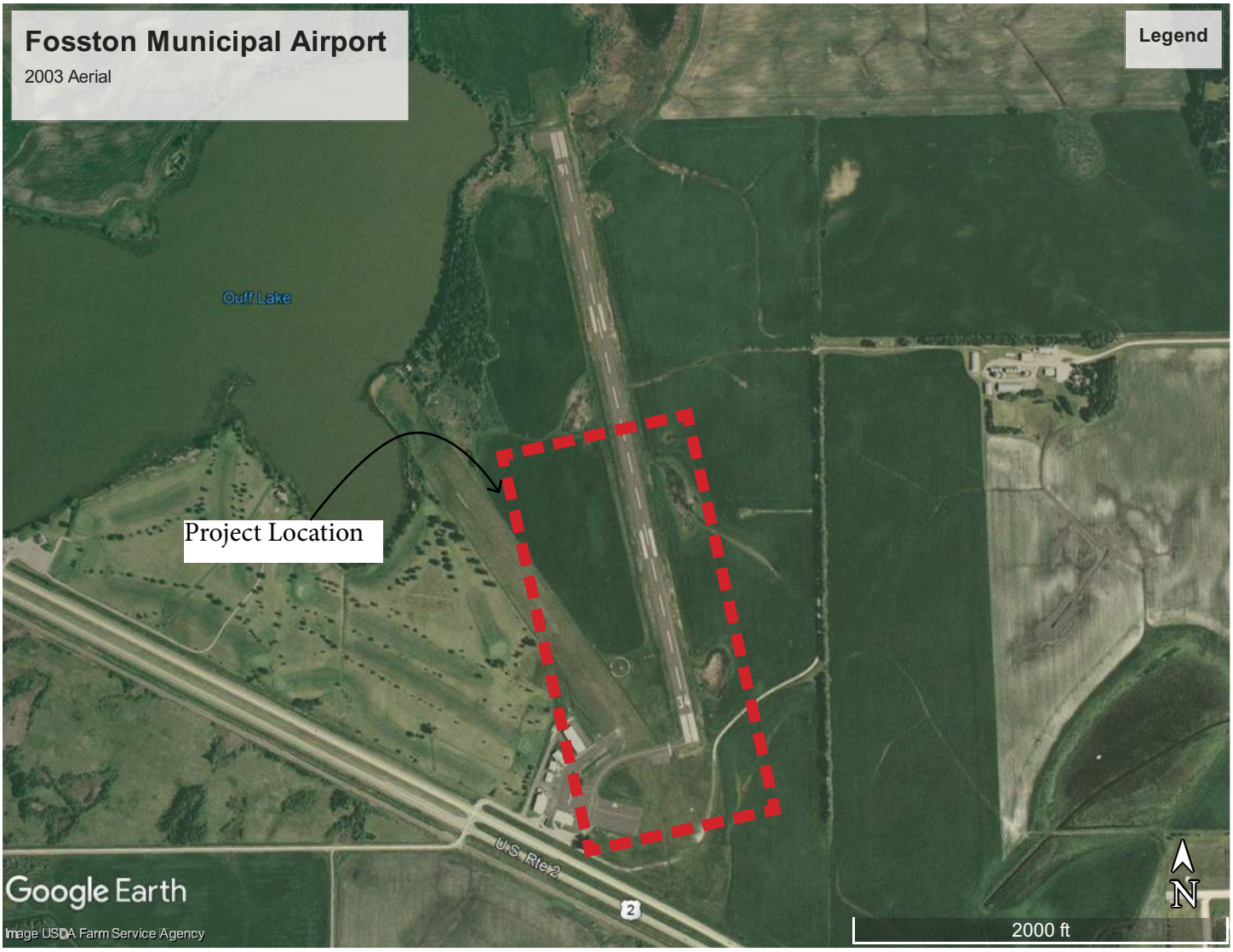
Fosston Municipal Airport - Aerial Photograph (1991)

Wetland Delineation
Date: July 19th, 2018

KARVAKKO

SEE MAP FOR SCALE

NORTH



Fosston Municipal Airport - Aerial Photograph (2003)

Wetland Delineation
Date: July 19th, 2018

KARVAKKO

SEE MAP FOR SCALE

NORTH

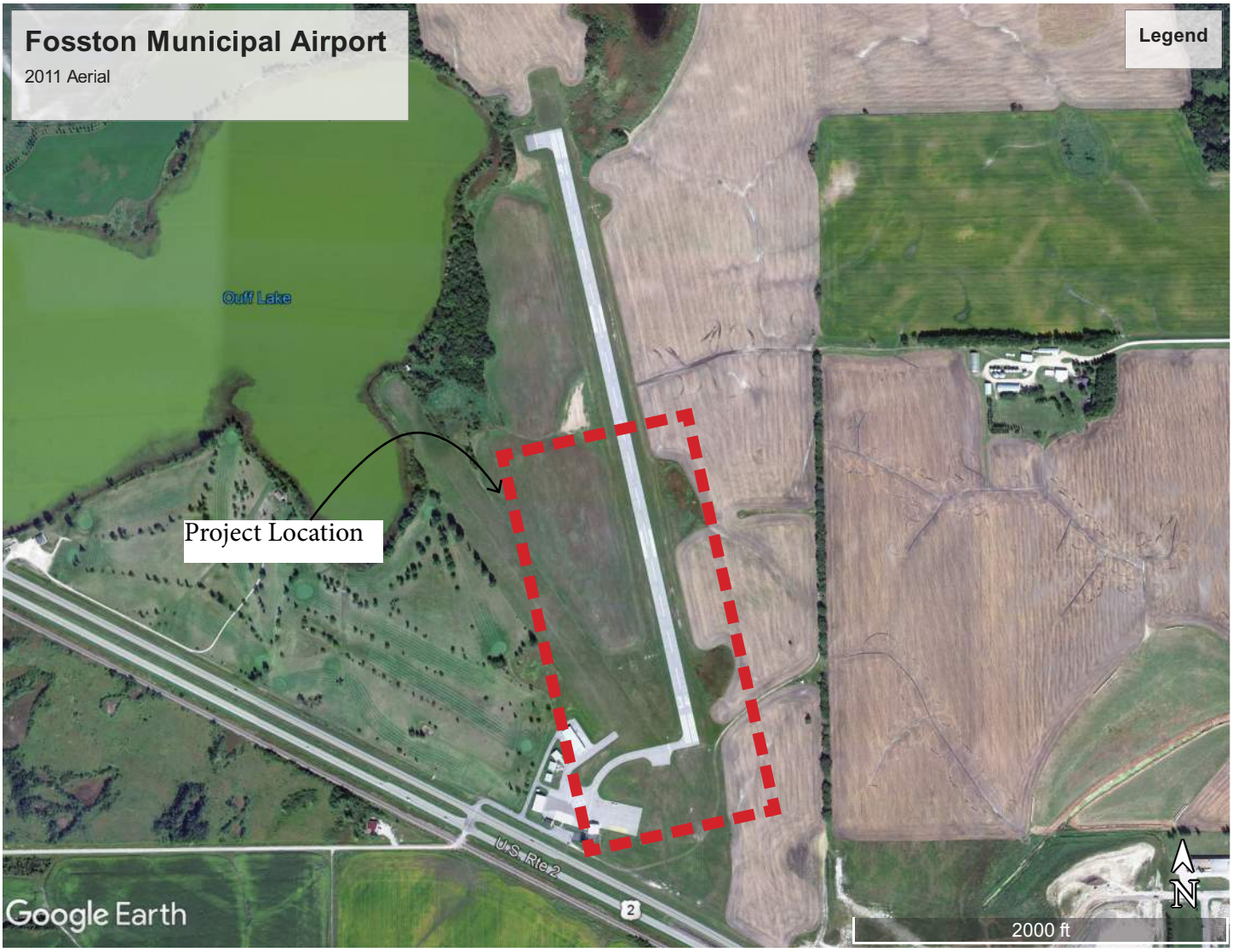
Fosston Municipal Airport - Aerial Photograph (2008)

Wetland Delineation
Date: July 19th, 2018

KARVAKKO

SEE MAP FOR SCALE

NORTH



Fosston Municipal Airport - Aerial Photograph (2011)

Wetland Delineation
Date: July 19th, 2018

KARVAKKO

SEE MAP FOR SCALE

NORTH

Fosston Municipal Airport - Aerial Photograph (2015)

Wetland Delineation
Date: July 19th, 2018

KARVAKKO

SEE MAP FOR SCALE

NORTH

ATTACHMENT 4

NWI MAP

U.S. Fish and Wildlife Service
National Wetlands Inventory

Fosston Municipal Airport

July 19, 2018

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Fosston Municipal Airport - NWI Map

Wetland Delineation
Date: July 19th, 2018

KARVAKKO

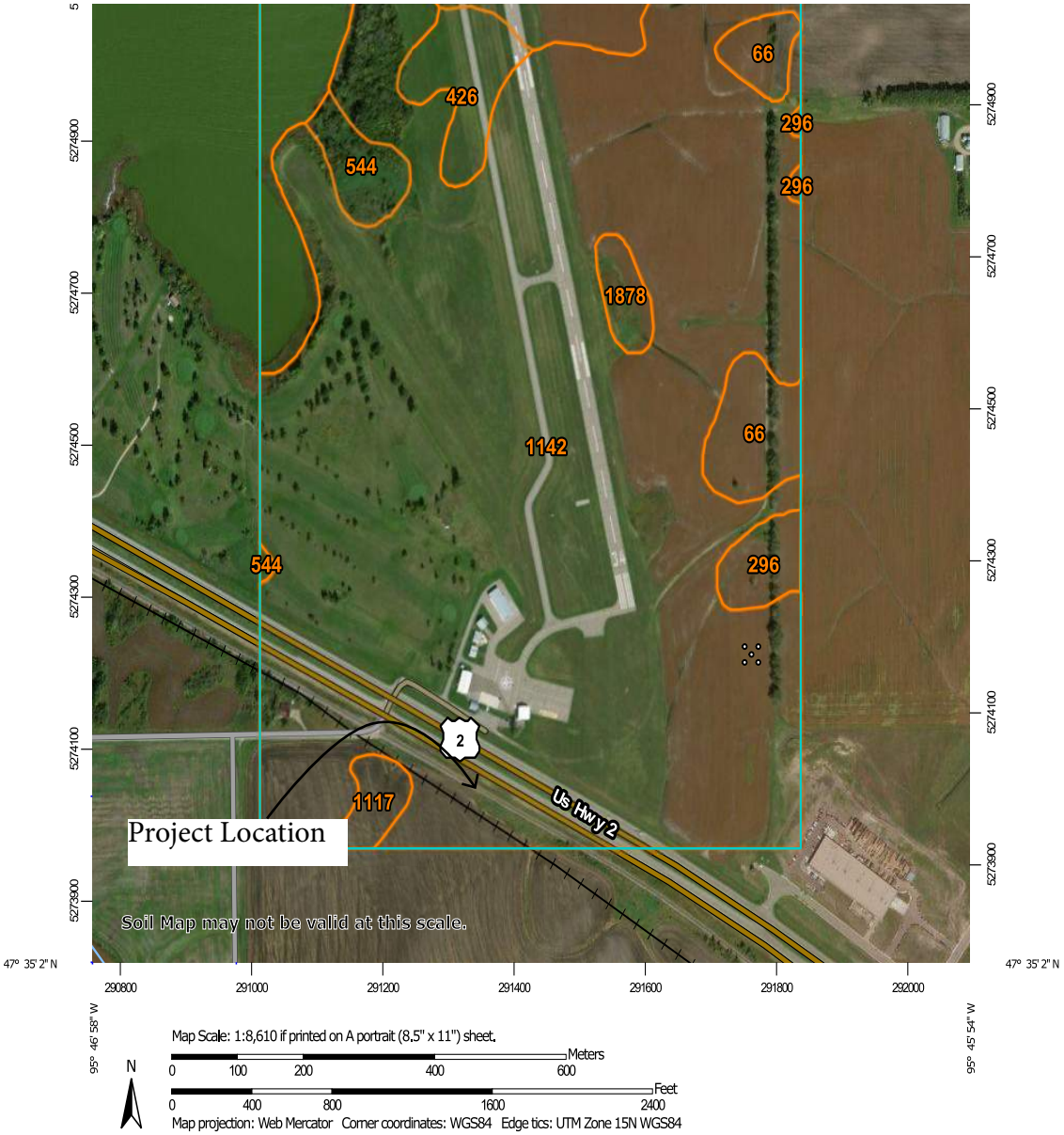
SEE MAP FOR SCALE

NORTH

ATTACHMENT 5

SOILS MAP

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
66	Flaming loamy fine sand	9.9	3.3%
296	Fram loam	4.7	1.6%
426	Foldahl loamy fine sand	11.3	3.8%
544	Cathro muck, occasionally ponded, 0 to 1 percent slopes	8.0	2.6%
671	Onstad loam	15.6	5.2%
1055	Quam, Cathro, and Urness soils, frequently ponded, 0 to 1 percent slopes	5.4	1.8%
1117	Hedman loam	2.4	0.8%
1142	Hedman-Fram complex	216.6	72.0%
1878	Hamre muck	2.3	0.7%
W	Water	24.9	8.3%
Totals for Area of Interest		**300.9**	**100.0%**



Fosston Municipal Airport - USDA Soils Map

Wetland Delineation

Date: July 19th, 2018

(See Appendices for full report)

KARVAKKO

SEE MAP FOR SCALE

NORTH

ATTACHMENT 6

WETLAND DATA SHEETS

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport | City/County: Fosston | Sampling Date: 7/17/18

Applicant/Owner: City of Fosston | State: MN | Sampling Point: T1/S1

Investigator(s): Keith Kinnen | Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): Convex

Slope (%): 5 | Lat: | Long: | Datum:

Soil Map Unit Name: 1142 Hedman-Fram complex | NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation ____, soil ____, or hydrology ____ naturally problematic? (If needed, explain any answers in remarks.)

SUMMARY OF FINDINGS

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	N
Hydric soil present?	Y	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	N		

Remarks: (Explain alternative procedures here or in a separate report.)

LOCATED BETWEEN RUNWAY AND WETLAND. LIKELY DISTURBED FROM AIRPORT DEVELOPMENT, BUT HAS NOT CHANGED WETLAND CONDITIONS SINCE 1991, ACCORDING TO AERIAL PHOTOS

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: ____)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5x5)			
1 *Phalaris arundinacea*	100	Y	FACW
2 *Cirsium arvense*	5	N	FACU
3			
4			
5			
6			
7			
8			
9			
10			
	105	= Total Cover	

Woody vine stratum (Plot size: ____)			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column totals	105 (A)		220 (B)

Prevalence Index = B/A = 2.10

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

plants and soils are hydric but no hydrology

SOIL

Sampling Point: T1/S1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-12	10YR2/1	100					CLAY LOAM	
12-16	10YR2/1	90	10YR6/2	10			SANDY CLAY	
16-24	10YR6/2	98	10YR6/3	2	D	M	SAND	SAND POCKET W/CONC.

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- X Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

RECIEVES RUNOFF FROM RUNWAY

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport City/County: Fosston Sampling Date: 7/17/18

Applicant/Owner: City of Fosston State: MN Sampling Point: T1/S2

Investigator(s): Keith Kinnen Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: Long: Datum:

Soil Map Unit Name: 1878 - Hamre muck NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation ____, soil ____, or hydrology ____ significantly disturbed?

Are vegetation ____, soil ____, or hydrology ____ naturally problematic?

Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

LOCATED BETWEEN RUNWAY AND WETLAND. LIKELY DISTURBED FROM AIRPORT DEVELOPMENT, BUT HAS NOT CHANGED WETLAND CONDITIONS SINCE 1991, ACCORDING TO AERIAL PHOTOS

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: ____)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5x5)			
1 *Typha angustifolia*	100	Y	OBL
2			
3			
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Woody vine stratum (Plot size: ____)			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	100	x 1 =	100
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		100 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

Reed canarygrass nearby, but soils fall out out (not mucky modified). Cattails appear to be wetland boundary in this area.

SOIL

Sampling Point: T1/S2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-8	10YR2/1	100					CLAY LOAM	MUCKY MODIFIED
8-12	10YR2/1	100					CLAY LOAM	NOT MUCKY MODIFIED
12-24	10YR6/3	60	GLEY1 5/5G	30	RM	M	CLAY	
			10YR8/1	5	C	M		

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

F1 - MUCKY MODIFIED. SOILS APPEAR TO BE THE FIRST HYDRIC INDICATOR TO FALL OUT IN THIS AREA.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WATER TABLE LIKELY CLOSE TO SURFACE WITH SATURATION AT 0", BUT NO WATER WAS OBSERVED IN

PIT. SNAILS FOUND IN AREA

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport | City/County: Fosston | Sampling Date: 7/17/18

Applicant/Owner: City of Fosston | State: MN | Sampling Point: T1/S3

Investigator(s): Keith Kinnen | Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): HILLSLOPE | Local relief (concave, convex, none): CONVEX

Slope (%): 5 | Lat: | Long: | Datum:

Soil Map Unit Name: 1142 - HEMAN LOAM | NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ___ significantly disturbed?

Are vegetation ___, soil ___, or hydrology ___ naturally problematic?

Are "normal circumstances" present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N	**Is the sampled area within a wetland?**	N
Hydric soil present?	N	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	N		

Remarks: (Explain alternative procedures here or in a separate report.)

SOYBEAN FIELD

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: ___)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5X5)			
1	100	Y	
2			
3			
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Woody vine stratum (Plot size: ___)			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	0	(A)	0	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

NOTE: AREA IS CROP OF SOYBEAN, BUT 'GLYCINE MAX' IS NOT AN OPTION IN THIS. THEREFORE I ASSUME THE "UPLAND" INDICATOR STATUS

SOIL

Sampling Point: T1/S3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-20	10YR2/1	100					CLAY LOAM	TILLED
20-24	10YR4/4	80	10YR2/2	10	C	M	CLAY LOAM	
			2.5YR8/1	10	RM	M		

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

WETLAND SOIL INDICATORS TOO DEEP

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SOYBEANS DISTRESSED WITHIN 20', BUT NO INDICATION OF SATURATION TODAY

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport | City/County: Fosston | Sampling Date: 7/17/18

Applicant/Owner: City of Fosston | State: MN | Sampling Point: T2/S1

Investigator(s): Keith Kinnen | Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): None

Slope (%): 5 | Lat: | Long: | Datum:

Soil Map Unit Name: 1142 Hedman-Fram complex | NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ___ significantly disturbed?

Are vegetation ___, soil ___, or hydrology ___ naturally problematic?

Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	N
Hydric soil present?	N	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	N		

Remarks: (Explain alternative procedures here or in a separate report.)

LOCATED BETWEEN RUNWAY AND WETLAND. LIKELY DISTURBED FROM AIRPORT DEVELOPMENT.

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5X5)	Absolute % Cover	Dominant Species	Indicator Staus
1 *Poa pratensis*	60	Y	FAC
2 *Solidago gigantea*	10	N	FACW
3 *Solidago canadensis*	10	N	FACU
4 *Phalaris arundinacea*	10	N	FACW
5 *Bromus inermis*	10	N	FACU
6 *Asclepias syriaca*	5	N	FACU
7			
8			
9			
10			
	105	= Total Cover	

Woody vine stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	20	x 2 =	40
FAC species	60	x 3 =	180
FACU species	25	x 4 =	100
UPL species	0	x 5 =	0
Column totals	105 (A)		320 (B)

Prevalence Index = B/A = 3.05

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

plants are hydric but no hydric soils or hydrology in this location

SOIL

Sampling Point: T2/S1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-8	10YR2/2	100					Clay Loam	
8-24	10YR5/3	60	10YR4/6	20	C	M	Clay Loam	looks like fill dirt
			10YR2/2	20	C	M		

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

DOES NOT MEET F1 - NOT MUCKY MODIFIED, SOIL APPEARS TO BE FILL DIRT.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

RECIEVES RUNOFF FROM RUNWAY

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport | City/County: Fosston | Sampling Date: 7/17/18

Applicant/Owner: City of Fosston | State: MN | Sampling Point: T2/S2

Investigator(s): Keith Kinnen | Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): toeslope | Local relief (concave, convex, none): concave

Slope (%): 5 | Lat: | Long: | Datum:

Soil Map Unit Name: 1878 - Hamre muck | NWI Classification: PEM1A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ___ significantly disturbed?

Are vegetation ___, soil ___, or hydrology ___ naturally problematic?

Are "normal circumstances" present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

LOCATED EAST OF RUNWAY

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size:)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5X5)			
1 *Phalaris arundinacea*	100	Y	FACW
2			
3			
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Woody vine stratum (Plot size:)			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	100	x 2 =	200
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		200 (B)

Prevalence Index = B/A = 2.00

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SEVERAL FROGS IN THIS AREA

SOIL

Sampling Point: T2/S2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-8	10YR2/1	100					CLAY LOAM	MUCKY MODIFIED
8-24	10YR6/1	90	10YR5/3	10	C	M	CLAY LOAM	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SEVERAL FROGS IN THIS AREA

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport | City/County: Fosston | Sampling Date: 7/17/18

Applicant/Owner: City of Fosston | State: MN | Sampling Point: T2/S3

Investigator(s): Keith Kinnen | Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): HILLSLOPE | Local relief (concave, convex, none): CONVEX

Slope (%): 5 | Lat: | Long: | Datum:

Soil Map Unit Name: 1142 - HEMAN LOAM | NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ___ significantly disturbed?

Are vegetation ___, soil ___, or hydrology ___ naturally problematic?

Are "normal circumstances" present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N	**Is the sampled area within a wetland?**	N
Hydric soil present?	N	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	N		

Remarks: (Explain alternative procedures here or in a separate report.)

SOYBEAN FIELD

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: ___)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5x5)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
	0	= Total Cover	

Woody vine stratum (Plot size: ___)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 0 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column totals	0	(A)	0	(B)

Prevalence Index = B/A = ___

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

NOTE: AREA IS CROP OF SOYBEAN, BUT 'GLYCINE MAX' IS NOT AN OPTION IN THIS. THEREFORE I USED "UPLAND" INDICATOR STATUS.

SOIL

Sampling Point: T2/S3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-16	10YR5/3	100					CLAY LOAM	TILLED
16+	10YR6/2	80	10YR4/6	10	C	M	CLAY	VERY FAT CLAY
			10YR8/1	10	RM	M		

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

TRICKY SPOT TO DELINEATE BECAUSE ANNUALLY TILLED AND ALL SOYBEAN. HYDRIC SOIL INDICATORS AR

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

SOYBEANS DISTRESSED WITHIN 20 FT, BUT NO INDICATION OF SATURATION TODAY

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport City/County: Fosston Sampling Date: 7/17/18

Applicant/Owner: City of Fosston State: MN Sampling Point: T3/S1

Investigator(s): Keith Kinnen Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): HILLSLOPE Local relief (concave, convex, none): NONE

Slope (%): 20 Lat: Long: Datum:

Soil Map Unit Name: 1142 Hedman-Fram complex NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ___ significantly disturbed?

Are vegetation ___, soil ___, or hydrology ___ naturally problematic?

Are "normal circumstances" present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N	**Is the sampled area within a wetland?**	N
Hydric soil present?	N	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	N		

Remarks: (Explain alternative procedures here or in a separate report.)

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size: ___)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5x5)			
1 *Poa pratensis*	50	Y	FAC
2 *Lolium perenne*	40	Y	FACU
3 *Melilotus officinalis*	20	N	FACU
4 *Taraxacum officinale*	10	N	FACU
5			
6			
7			
8			
9			
10			
	120	= Total Cover	

Woody vine stratum (Plot size: ___)			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column totals	120 (A)		430 (B)

Prevalence Index = B/A = 3.58

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: T3/S1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-16	10YR2/1	100					CLAY	
16-24+	10YR2/1	98	10YR4/2	2	C	M	CLAY	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport | City/County: Fosston | Sampling Date: 7/17/18

Applicant/Owner: City of Fosston | State: MN | Sampling Point: T3/S2

Investigator(s): Keith Kinnen | Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): WETLAND BOTTOM | Local relief (concave, convex, none): CONCAVE

Slope (%): 1 | Lat: | Long: | Datum:

Soil Map Unit Name: 1142 Hedman-Fram complex | NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ___ significantly disturbed?

Are vegetation ___, soil ___, or hydrology ___ naturally problematic?

Are "normal circumstances" present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

LOCATED OFF SLOPE OF RUNWAY IN FARM FIELD

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5x5)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2 *Spartina pectinata*	70	Y	FACW
3 *Scirpus atrovirens*	25	Y	OBL
4 *Schoenoplectus tabernaemontani*	5	N	OBL
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Woody vine stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	30	x 1 =	30
FACW species	70	x 2 =	140
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	100 (A)		170 (B)

Prevalence Index = B/A = 1.70

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: T3/S2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-4	10YR2/1	100					CLAY	MUCKY MODIFIED
4-12	GLEY1/2.5/5GY	100					CLAY	
12-24	2.5YR5/1	50	2.5YR5/6	50	C	M	CLAY	RM AND C

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- X Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ALGAE MAT ON TOP

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport | City/County: Fosston | Sampling Date: 7/17/18

Applicant/Owner: City of Fosston | State: MN | Sampling Point: T3/S3

Investigator(s): Keith Kinnen | Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): CONVEX

Slope (%): 5 | Lat: | Long: | Datum:

Soil Map Unit Name: 1142 Hedman-Fram complex | NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ___ significantly disturbed?

Are vegetation ___, soil ___, or hydrology ___ naturally problematic?

Are "normal circumstances" present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N	**Is the sampled area within a wetland?**	N
Hydric soil present?	N	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	N		

Remarks: (Explain alternative procedures here or in a separate report.)

ADJACENT TO RUNWAY IN FARM FIELD, BUT NOT PLANTED WITH CROPS

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5x5)	Absolute % Cover	Dominant Species	Indicator Staus
1 *Lolium perenne*	90	Y	FACU
2 *Spartina pectinata*	10	N	FACW
3 *Melilotus officinalis*	5	N	FACU
4			
5			
6			
7			
8			
9			
10			
	105	= Total Cover	

Woody vine stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	95	x 4 =	380
UPL species	0	x 5 =	0
Column totals	105 (A)		400 (B)

Prevalence Index = B/A = 3.81

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

SOIL

Sampling Point: T3/S3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-14	10YR2/1	100					CLAY LOAM	
14-18	10YR2/1	100					CLAY LOAM	MUCKY MODIFIED
18+	10YR6/3	95	10YR5/4	5	C	M	CLAY LOAM	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

MUCKY MODIFIED LAYER TOO DEEP TO MEET F1 CRITERIA. AREA IS LIKELY PREVIOUSLY FILLED.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport | City/County: Fosston | Sampling Date: 7/17/18

Applicant/Owner: City of Fosston | State: MN | Sampling Point: T4/S1

Investigator(s): Keith Kinnen | Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): NONE

Slope (%): 20 | Lat: | Long: | Datum:

Soil Map Unit Name: 1142 Hedman-Fram complex | NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ___ significantly disturbed?

Are vegetation ___, soil ___, or hydrology ___ naturally problematic?

Are "normal circumstances" present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	N	**Is the sampled area within a wetland?**	N
Hydric soil present?	N	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	N		

Remarks: (Explain alternative procedures here or in a separate report.)

ADJACENT TO HANGAR APRONS, HILLSLOPE TO DITCH, FRESH SEED FROM RECENT CONSTRUCTION PROJECT

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size:)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5x5)			
1 *Lolium perenne*	60	Y	FACU
2 *Poa pratensis*	40	Y	FAC
3			
4			
5			
6			
7			
8			
9			
10			
	100	= Total Cover	

Woody vine stratum (Plot size:)			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	60	x 4 =	240
UPL species	0	x 5 =	0
Column totals	100 (A)		360 (B)

Prevalence Index = B/A = 3.60

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- ___ Dominance test is >50%
- ___ Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? N

Remarks: (Include photo numbers here or on a separate sheet)

RECENTLY SEEDED FROM LAST YEAR'S CONSTRUCTION PROJECT. LIKELY A MNDOT 25-131 SEED MIX

SOIL

Sampling Point: T4/S1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-2	10YR2/2	100					SANDY CLAY LOAM	TOPSOIL
2-6	10YR5/3	100					CLAY LOAM	
6-8	10YR5/3	100					CLAY	
8-16	10YR5/3	98	10YR5/6	2	C	M	CLAY	FAINT REDOX
16+	10YR5/3	96	10YR4/6	2	RM	M	CLAY	
			10YR5/2	2	C	M	CLAY	DISTINCT REDOX

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? N

Remarks:

DISTINCT REDOX AND REDUCED MATRIX AT 16" BUT TOO DEEP TO MEET HYDRIC SOIL INDICATORS

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	___	No	X	Depth (inches):	___

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

AREA DISTURBED FROM HANGAR DEVELOPMENT

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Fosston Municipal Airport | City/County: Fosston | Sampling Date: 7/17/18

Applicant/Owner: City of Fosston | State: MN | Sampling Point: T4/S2

Investigator(s): Keith Kinnen | Section, Township, Range: S32 T148 R40

Landform (hillslope, terrace, etc.): DITCH BOTTOM | Local relief (concave, convex, none): LINEAR

Slope (%): 1 | Lat: | Long: | Datum:

Soil Map Unit Name: 1142 Hedman-Fram complex | NWI Classification: NA

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation X, soil X, or hydrology ___ significantly disturbed?

Are vegetation ___, soil ___, or hydrology ___ naturally problematic?

Are "normal circumstances" present? No

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	Y	**Is the sampled area within a wetland?**	Y
Hydric soil present?	Y	If yes, optional wetland site ID:	
Indicators of wetland hydrology present?	Y		

Remarks: (Explain alternative procedures here or in a separate report.)

I BELIEVE THIS WETLAND IS INCIDENTAL TO AIRPORT DEVELOPMENT

VEGETATION -- Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species	Indicator Staus
1			
2			
3			
4			
5			
	0	= Total Cover	

Sapling/Shrub stratum (Plot size:)			
1			
2			
3			
4			
5			
	0	= Total Cover	

Herb stratum (Plot size: 5x5)			
1 *Eleocharis palustris*	100	Y	OBL
2 *Spartina pectinata*	10	N	FACW
3			
4			
5			
6			
7			
8			
9			
10			
	110	= Total Cover	

Woody vine stratum (Plot size:)			
1			
2			
	0	= Total Cover	

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across all Strata: 1 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index Worksheet

Total % Cover of:

OBL species	100	x 1 =	100
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column totals	110 (A)		120 (B)

Prevalence Index = B/A = 1.09

Hydrophytic Vegetation Indicators:

- ___ Rapid test for hydrophytic vegetation
- X Dominance test is >50%
- X Prevalence index is ≤3.0*
- ___ Morphogical adaptations* (provide supporting data in Remarks or on a separate sheet)
- ___ Problematic hydrophytic vegetation* (explain)

*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic vegetation present? Y

Remarks: (Include photo numbers here or on a separate sheet)

FRESH SEED/MULCH FROM RECENT CONSTRUCTION BUT TOO WET FOR SEED MIX AND VOLUNTEER WETLAND PLANTS ARE GROWING.

SOIL

Sampling Point: T4/S2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (Inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type*	Loc**	Texture	Remarks
0-6	10YR2/1	100					CLAY	MUCKY MODIFIED
6+	10YR5/1	50	10YR5/6	50	RM	M	SANDY CLAY	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ___ Histisol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L)**
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (explain in remarks)

*Indicators of hydrophytic vegetation and weltand hydrology must be present, unless disturbed or problematic

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric soil present? Y

Remarks:

MEETS F1 CRITERIA

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- X Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	Yes	___	No	X	Depth (inches):	___
Water table present?	Yes	___	No	X	Depth (inches):	___
Saturation present? (includes capillary fringe)	Yes	X	No	___	Depth (inches):	0

Indicators of wetland hydrology present? Y

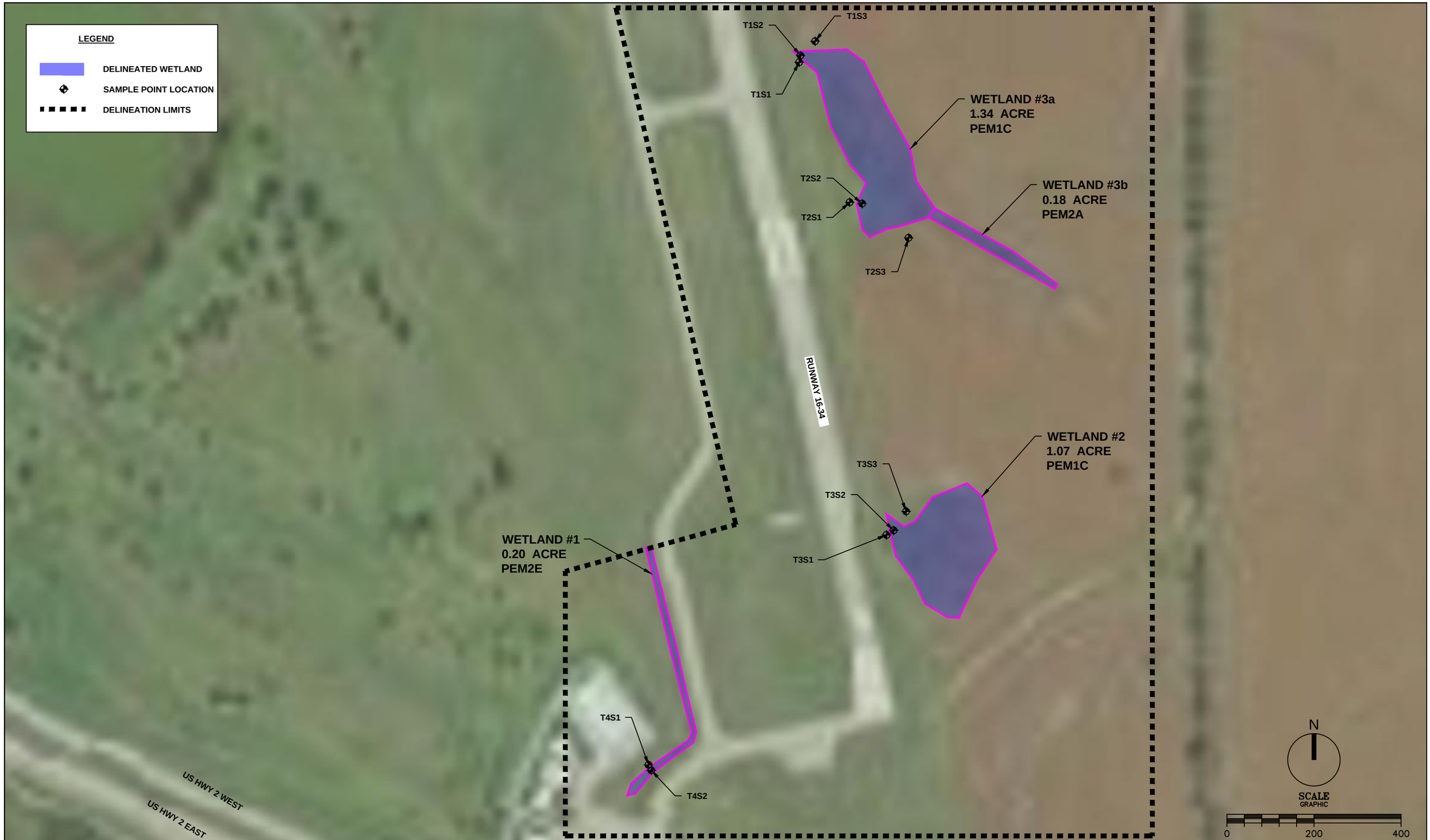
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ADJACENT TO HANGAR APRON IN DITCH BOTTOM

ATTACHMENT 7

WETLAND DELINEATION MAP



I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Certified Wetland Delineator under the laws of the State of Minnesota.

Certified By: _____ Lic. No. 1244

Printed Name: Keith E. Kinnen Date 2/13/19

KARVAKKO

2300 BEMIDJI AVE N, SUITE 101, BEMIDJI, MN 56601
PHONE: (218) 444-8004 FAX: (218) 444-8562

NO.	REVISIONS	BY	APR.	DATE
	UPDATED WETLAND #3 BOUNDARY AND DELINEATION LIMITS PER TEP	KEK	KEK	7/10/2019

DESIGNED KEK	CHECKED KEK
DRAWN ERF	APPROVED KEK
DATE 07/18/18	JOB NO. 18-007

WETLAND OVERVIEW MAP
FOSSTON MUNICIPAL AIRPORT
POLK COUNTY, MINNESOTA