

Technical Memorandum



To: *NEPA/404 Agency Working Group
FAA Dakota-Minnesota Airports District Office*

From: *Evan Barrett, Mead & Hunt*

Date: *November 20, 2015*

Subject: *DTL Runway 13/31 Federal EA/State EIS
Alternate Airport Site Analysis Re-Evaluation*

The Detroit Lakes-Becker County Airport (DTL) wishes to proceed with airside projects identified by its Master Plan, to improve the operational reliability, safety, and utility of the airfield. These projects would bring primary Runway 13/31 into compliance with Federal Aviation Administration (FAA) and Minnesota Department of Transportation (MnDOT) design standards and guidance, and are expected to include the following:

- A shift, extension, widening, and reconstruction of the Airport's primary runway and parallel taxiway to meet FAA and MnDOT design standards and operator runway length requirements;
- Reconstruction of the primary runway to replace aging and deteriorating pavement;
- An instrument approach to the Airport's primary runway with precision CAT-I minimums (1/2 statute mile visibility and 200-foot cloud ceiling) to meet MnDOT State Aviation System Plan (SASP) requirements; and
- Property acquisition to accommodate the runway and approach improvements.

The City of Detroit Lakes, as the Airport sponsor, began an environmental review process for similar airport improvements in the early 2000s. A draft joint Federal Environmental Assessment (EA)/State Environmental Impact Statement (EIS) was initially released for agency review in late 2003, which resulted in substantial comments. In the past decade, there have been ongoing efforts to resolve the outstanding issues. In 2014, a new approach to environmental review for the project was developed based on agency discussions held in recent years and consideration of changes in circumstances that have occurred since the process began. These changes include initiation of the City's ongoing City Wastewater Treatment Plant (WWTP) study; FAA's Runway Protection Zone (RPZ) September 2012 interim guidance; planned and recently completed road projects in the vicinity of the airport; and updated FAA environmental process guidance including Order 1050.1E, *Environmental Impacts: Policies and Procedures* (issued March 2006, and further updated to version 1F in July 2015), and Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects* (issued April 2006).

In addition to on-site alternatives, several alternate sites for a relocated airport were also considered by the previous Federal EA/State EIS. An Alternative Sites Study completed in 2004 utilized ArcView GIS to overlay wetlands, wildlife attractants and management areas, and shoreland areas over aerial photography and USGS topographic maps to identify potential alternate sites. The study examined an area within ten miles of Detroit Lakes city center to maximize the Airport's support of area businesses and residents. However, due to the time elapsed since the study and the changing circumstances described

above, a re-evaluation of the sites is needed. The purpose of this re-evaluation is to validate the finding of the previous study that there is not a viable alternative site preferable to the existing site, when considering comparative environmental impacts and cost.

The seven alternate sites identified by the 2004 study are shown in **Figure B**. The property footprint for the existing Airport is just over 700 acres. The footprint allows for the runway to be aligned with prevailing winds and for protection of its safety zones, with ample room for landside development and access to the Airport. Land size must correspond to Airport operational needs to ensure that the proposed location will provide enough space for future facilities.

These seven sites were chosen based on their proximity to the City of Detroit Lakes and avoidance of natural obstacles such as wetlands, lakes, and wildlife management areas. Additionally, the shoreland buffers (discussed in more detail below) surrounding public waters were avoided as much as possible, which limited available sites to the west and north of the city due to the dense clusters of ponds and lakes. Aerial towers were also evaluated to avoid conflict with aircraft operations. For reasons described in more detail below, these seven sites were chosen based on their ability to best meet the needs of the community, to satisfy the needs of the airport, and to conform with surrounding land uses. While other potential sites may exist within ten miles of the City of Detroit Lakes, it is likely they would have many of the same challenges.

1.0 Alternate Site Re-Evaluation Criteria

The site re-evaluation presented below seeks to provide balanced consideration of several factors, in order to identify the most advantageous airport site while limiting impact to the environment and surrounding communities. Factors considered by the analysis include the following:

- **Location.** FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, states that an airport should be included in the NPIAS if it is more than an average 30 minute drive time, or a 20 mile driving distance, to the nearest existing or proposed NPIAS airport. If DTL was relocated to an area that is too close to another existing airport it may compromise the utility of the either DTL or a neighboring airport. A visual representation of the location of other airports and alternate sites is shown on **Figure B** on the next page, while **Table 1** on Page 4 compares the distances from DTL to other airports in the area. As Hawley is the closest airport by both distance and time, any sites to the west or north of the current location would decrease the driving time to Hawley Municipal and compromise the utility of both airports. Additionally, numerous Wildlife Management Areas (WMA) and Waterfowl Production Areas (WPA) limit available open land in those directions. The hazards posed by WMAs and WPAs will be discussed in more detail below in the wildlife section. Finally, many of the lakes in Becker County are considered public waters and classified as Natural Environment Lakes, the restrictions associated with this classification are discussed in the Shoreland Buffer section below.
- **Jurisdiction.** DTL is jointly owned by the City of Detroit Lakes and Becker County. As such, only sites within the boundaries of Becker County were considered.

| Airport | Driving Distance from DTL (Miles) | Driving Time from DTL (Minutes) | Longest Runway |
|------------------------|--|--|-----------------------|
| Hawley Municipal | 25 | 26 | 3,398 feet |
| Fergus Falls Municipal | 46 | 54 | 5,639 feet |
| Wadena Municipal | 42 | 42 | 4,007 feet |
| Parks Rapids Municipal | 41 | 47 | 5,497 feet |
| Mahnomen County | 32 | 35 | 3,400 feet |

Sources: FAA Airport/Facility Directory Valid October 15 2015 – December 9 2015, Google

- Accessibility.** A viable airport site must offer accessibility to the city of Detroit Lakes through close proximity and highway access, to conveniently serve its businesses, residents, and visitors. For these reasons alternate sites were confined to a 10 mile radius from the city center. The existing Airport site is located within the City limits and none of the alternate sites would have the same convenience to users as the current location. Accessibility was measured for each alternate site as determined by available access roads and distance from the Detroit Lakes city center.
- Existing Infrastructure.** Preexisting facilities at certain sites are likely to create additional costs, hazards to aircraft, and conflicts with land use. This criterion identifies any existing power lines, gas lines, roads, or other similar facilities that would require removal or modification in order to build a new airport on the site.
- Topography.** Excessive runway grade is undesirable as it can limit aircraft from departing uphill or landing downhill due to the increased takeoff and landing distance required. The FAA permits a maximum grade change of two percent across most airport surfaces (Advisory Circular 150/5300-13A). Airport construction on uneven topography usually results in increased construction costs and timelines as the surfaces must be extensively graded. The MnDNR MnTOPO tool was used to determine terrain variation over the project areas.
- Wildlife.** Open water, wetlands, and lands and waters administered by the US Fish and Wildlife Service (USFWS) Realty Program (are often an attractant for birds and other wildlife hazardous to aviation. The FAA reports that 78 percent of bird strikes occur at or below 1,000 feet above ground level (AGL), which is a typical traffic pattern altitude for general aviation aircraft and smaller commercial flights, and 90 percent occur below 3,000 feet. The prime natural surroundings and abundant open water of the Detroit Lakes area make birds, and particularly waterfowl, a primary concern for analyzing alternate airport sites. Relevant land uses and prominent wetlands within a 10,000 foot radius of the site will be discussed, as this is the distance identified by FAA Advisory Circular 150/5200-33B, *Hazardous Wildlife Attractants On or Near Airports*, as the minimum desirable distance between the airport operations area and wildlife attractants for airports serving turbine powered aircraft.

- **Shoreland Buffer** Minnesota Administrative Rules 6120.2500 – 3900, *Shoreland Management*, provide land use limitations for shoreland surrounding public waters. Shoreland, as applicable here, is 1,000 feet from the ordinary high water level of a lake, pond, or flowage and 300 feet from a river or stream. Public waters are lakes, ponds, or flowages, more than 10 acres in size within municipalities and greater than 25 acres in size in unincorporated areas. The MnDNR Commissioner may reclassify public waters and applicable shoreland buffers as the need arises. Public water lakes are further divided into the following three categories, in order of primitive conditions to developed conditions: 1) Natural Environment Lakes, 2) Recreational Development Lakes, and 3) General Development Lakes. By default, any body of water with one of these classifications is considered public water. Industrial use, such as an airport, is normally a conditionally allowed use in General Development and Recreational Development Lakes but is prohibited surrounding Natural Environment Lakes. Variation from these standards are conditionally permitted by a request from local government supported by written justification and documentation to the DNR Commissioner. The classification of the lakes and their shoreland buffers surrounding a given site will be discussed in this section.
- **Wetlands.** The impact to wetlands as measured by approximate acreage will be noted by this criterion. Wetlands are protected by Executive Order Number 11990, *Protection of Wetlands*, which limits construction on wetlands to when there are no other reasonable alternatives. Alternatives discussed within this document will therefore seek to avoid, minimize, and mitigate wetland impacts whenever possible. An examination of the US FWS Wetlands Mapper was used to determine approximate wetland coverage within the boundaries of the proposed sites. It should be noted that the total acreage of wetlands does not necessarily correlate exactly to wetland impacts as impact reduction strategies may be identified for each individual site during design.
- **Tree Removal.** In April 2015, the Northern Long-Eared Bat was listed as threatened under the Endangered Species Act. Minnesota contains a considerable portion of the forests in the Midwest region and the loss of forest habitat is a contributing source of endangerment to the species, as it provides nesting areas during the breeding season. The removal of large groups of trees should be avoided if possible, particularly near wetlands. Additionally, removing heavily forested areas at various sites presents a considerable challenge for preparing the land while increasing cost and timeline for an airport construction project. Acreage estimates for this section were determined by examining aerial photography and should be considered a reference point only.
- **Residential Impact.** Ideally, surrounding land uses should not conflict with airport operations or present operational hazards. Constructing an airport on some of the sites would require the relocation of private residences in order to achieve this goal.
- **Aircraft Noise.** Noise related to airport operations is often a concern for surrounding residential, recreational, and wildlife areas. FAA Advisory Circular 91-36D provides guidance on *Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas*. While not regulatory in nature, this AC recommends that pilots maintain an altitude of at least 2,000 AGL over areas where a quiet setting is a generally recognized feature or attribute.

1.1 Alternate Airport Sites

Below is a discussion of each alternate site based upon the above criteria. **Table 1-2** at the end of the analysis provides a summary comparison, while the following sections provide details on specific obstacles, their nature, and magnitude.

1.1.1 Site One

Site One is located approximately six miles north of the City near Floyd Lake as shown in **Exhibit B1** at the end of this memorandum.

Accessibility. As County Highway 21 would run along its eastern boundary, access to the Airport would be a relatively direct six mile route from the City.

Existing Infrastructure. At least a partial closure of County Road 149 would be necessary to facilitate construction on this site. This would leave 230th Street as the only remaining connection between U.S. Highway 59 to the west and County Highway 21 to the east, inconveniencing residents living north of the City.

Topography. The difference in elevation between the high and low points of the site is approximately 110 feet, from the northeastern corner to the shores of Floyd Lake to the south.

Wildlife. Based on their online database, it appears that the USFWS currently holds an easement on a 153 acre section of land located less than half a mile to the west of this site. While numerous small tracts of wetlands are in the area a large section of approximately 300 acres of wetlands are located less than a mile to the north within the 10,000 foot buffer surrounding Campbell Lake.

Shoreland Buffer. This site would be within the 1,000 buffer of three public lakes. Floyd Lake would be the primary lake adjacent to the site and is classified as a General Development lake by both the DNR and the County. Little Floyd Lake is also a General Development Lake according to both the County and the DNR and would also be impacted. Finally, a small portion of Sands Lake may require infill and is classified as a Natural Environment Lake by both the DNR and the County. Industrial land use, such as an airport, is prohibited within the 1,000 foot shoreland buffer.

Wetlands. Approximately 60 acres of wetlands are within the boundaries of the proposed site according to the USFWS Wetlands mapper. Wetlands here are not concentrated in any one area but are instead dispersed throughout the site.

Tree Removal. Site One contains approximately 230 acres of wooded area that would need to be removed.

Residential Impact. Utilization of this site would require relocation of at least 15 residences. Residences along County Road 149 and 230th Street may require relocation to avoid overlap with Airport property and Safety Zone A.

Aircraft Noise. The two bodies of water to the south, Floyd Lake and Little Floyd Lake, are heavily populated and are used as recreational bodies of water with well over 100 private docks and numerous homes situated along the shoreline. Traffic patterns necessitated by the proposed layout at Site One would require air traffic directly over these lakes. Airport construction on this site may result in Safety Area B conflicts due to housing and recreational activity in the area.

Conclusion.

- **Advantages** – The existing road, County Highway 21, provides accessibility to the site with only minor modifications needed.
- **Disadvantages** – This site presents multiple challenges. Construction would be made difficult by the topography and amount of tree removal. Once established, the airport would likely be subjected to hazardous wildlife from the nearby WPA. Finally, the airport would subject surrounding residences to undesirable impacts through relocation and aircraft noise.

1.1.2 Site Two

Site Two is located approximately eight miles northeast of the center of Detroit Lakes and two miles east of Site One. Due to its proximity to Site One, Site Two is very similar in topography and surrounding obstacles as shown in **Exhibit B2** at the end of this memorandum.

Accessibility. The proposed site is bordered by County Highway 32 and County Highway 25 on its northern and eastern edges, respectively, which would provide sufficient landside access and convenience to the City of Detroit Lakes.

Existing Infrastructure. This site would require a partial closure of Hage Road. Currently, Hage Road is exclusively as a residential road and if the residents were displaced the closure of this road would not present any additional complications to travel in the local area.

Topography. Approximately 90 feet of variation exists between the higher elevations in the northeast portion of the site and the generally lower elevations in the southwest portion.

Wildlife. There are two WPAs less than half a mile from the site. Both appear to be easements with the USFWS for use as a WPA. Both USFWS interest areas are located less than half a mile from the proposed site.

Shoreland Buffer. While there are several small bodies of water at the site, none are categorized as Public Waters and therefore no shoreland buffers would be affected at this site.

Wetlands. Small tracts of wetlands are common in the area, and a large area of approximately 100 acres of wetlands is located adjacent to the west of this site. Similar to Site One, Site Two would also affect approximately 65 acres of wetlands as there are small pockets throughout the site.

Tree Removal. Large areas of forest removal would be necessary on the north and west sections of the site totaling approximately 220 acres.

Residential Impact. This site would require displacement of less than a dozen residences. Currently residences are positioned along Hage Road and County Highway 32.

Aircraft Noise. Given the sparse development in this area aircraft noise is not expected to be a concern.

Conclusion.

- **Advantages** – This is one of the few sites that would not interfere with the shoreland buffer zones of any public waters. Additionally, the nearby County Highway 25 would provide ready access to the site.
- **Disadvantages** – Hage Road would have to be closed and the associated residents displaced. Construction activities would be challenging due to tree removal and topographic changes, and the nearby WPAs would likely present a wildlife hazard. This site would require a large amount of wetland fill.

1.1.3 Site Three

Site Three is located approximately five miles east of the Detroit Lakes city center, as shown in **Exhibit B3** at the end of this memorandum.

Accessibility. This site offers limited landside access, as there are no major roads directly adjacent to the site. Improved roadways would be needed, either through expansion of the existing 170th Street or the addition of new routes to connect to US Highway 10.

Existing Infrastructure. Power lines run from the northwest corner to the eastern boundary of the site and would need to be rerouted.

Topography. Topography over this site varies considerably, often changing up to 50 feet over short distances, with a total elevation change of approximately 100 feet.

Wildlife. An easement held by the USFWS for a WPA appears to be located within one mile to the northwest of the proposed site. Additionally, two WMAs are located at the very edge of the 10,000 foot buffer, the Struss WMA to the northwest and the Pickerel Lake WMA to the north. A section of approximately 100 acres of wetlands is located to the east of this site surrounding Rice Lake.

Shoreland Buffer. Several Public Lakes are located nearby. One unnamed public body of water is categorized as a Natural Environment Lake (DNR Lake ID #03025200) and would be impacted. The site would also fall within the 1,000 foot buffer of Neuner Lake, Howe Lake, and Elbow Lake, all of which are classified by the DNR and County as Natural Environment Lakes. As noted previously, airports are a prohibited use within the Shoreland Buffer of Natural Environment Lakes.

Wetlands. Most of the wetlands on this site are small individual areas often no larger than half an acre. In total, wetlands cover approximately 45 acres. The many small ponds on the site could be challenging obstacles in the event of an emergency response situation.

Tree Removal. Heavy forest covers the entire area. Approximately 650 acres of woodland exist within the proposed footprint on this site.

Residential Impact. Approximately 20 residences would need to be relocated.

Aircraft Noise. Site Three has few overflight concerns from residential areas given the sparse development to the south, and a virtual lack of development immediately adjacent to the site in all other directions.

Conclusion.

- **Advantages** – This site would present few overflight and noise concerns.
- **Disadvantages** – There are no suitable existing roads that could service the airport, and changes in topography and the amount of trees to be removed would present challenges to construction and potentially listed ESA species. Known wetland impacts would be large and there is a potential for forested wetland impacts with the large forest existing at the site. Finally, the site would require the relocation of approximately 20 residents.

1.1.4 Site Four

Site Four is located halfway between the cities of Detroit Lakes and Frazee near U.S. Highway 10, approximately six miles southeast of the Detroit Lakes city center, as shown in **Exhibit B4** at the end of this memorandum.

Accessibility. County Highway 54 is situated in the northeastern corner of the site. The Highway's proximity would allow for a direct access point to the airport capable of supporting any necessary traffic, although the airport layout may require some minor modifications to accommodate the road.

Existing Infrastructure. Power lines run through the southern portion of the site and would need to be relocated. Several small residential areas are in the vicinity and the residences and associated roadways would need to be removed.

Topography. Areas north and south of Youman Lake have an average elevation of approximately 1,400 feet. Elevations rise to the west and east reaching elevations as high as 1,480 feet for a total change of 80 feet.

Wildlife. Based on their online database, it appears the USFWS has an easement for a WPA located less than 1.5 miles to the west. Additionally, small pockets of approximately 10 acres each of wetlands are present to the south.

Shoreland Buffer. Youman Lake is situated within the proposed site and would require nearly a complete infill. Additionally, another unnamed public water body (DNR lake ID # 03025600) 33 acres in size would be impacted by this site selection. Both lakes are Natural Environment Lakes and airport use within the shoreland buffer is prohibited without consent from the DNR Commissioner.

Wetlands. Small lakes and wetlands at this site present considerable barriers. Construction in this area would impact over 50 acres of wetlands (including Youman Lake) and interfere with the 1,000 foot shoreline buffer set around dozens of small bodies of water throughout the area.

Tree Removal. A large portion of the area is heavily wooded. Approximately 350 acres of forest exist within the footprint at this location, mainly to the east and west of Youman Lake.

Residential Impact. Less than a dozen residences would likely need to be relocated. The majority of the area within the confines of the airport site is not populated although north of the area does contain a residential area, the impacts of which are discussed below.

Aircraft Noise. Surrounding land uses are not ideal, as residential areas lie less than a mile to the north of the proposed site and would be subjected to noise. An altitude greater than 1,000 feet would be very difficult for small aircraft to attain given the proximity of residential developments. Traffic patterns at Site Four would necessitate flight at 1,000 feet, or even less, over residential areas to the north and more sparsely populated areas to the west and south.

Conclusion.

- **Advantages** – Nearby County Highway 54 would provide ideal access to the site.
- **Disadvantages** – Existing natural and manmade obstacles would present multiple difficulties in construction. Power lines, wetlands, Youman Lake, numerous trees, topography, and residents are all located within the suggested airport footprint. This would result in a considerable impact to both natural and manmade resources.

1.1.5 Site Five

Located less than two miles from Frazee this site would be the furthest from the city center of Detroit Lakes, at approximately nine miles, as shown in **Exhibit B5** at the end of this memorandum.

Accessibility. County Highway 54 is located just to the west of the proposed site and would provide excellent access for airport traffic.

Existing Infrastructure. No existing infrastructure would require relocation for this site.

Topography. The large amount of wetlands on the site indicate little elevation change, with a total elevation change of only 30 feet occurring in the northern portion of the site.

Wildlife. There are no USFWS areas of interest within 10,000 feet but approximately 200 acres of wetland would be located adjacent to the south.

Shoreland Buffer. Both Gebo Lake and Brink Lake would require partial infill. Both lakes are Natural Environment Lakes and airport use within the shoreland buffer is prohibited without consent from the DNR Commissioner.

Wetlands. Construction here would impact over 100 acres of wetland. This would include the partial infill of two lakes, Gebo Lake and Brink Lake. In 2008, efforts were undertaken to start restoring Brink Lake, which was drained in 1915. Over the course of five years, landowners worked with the Soil and Water Conservation District, the Natural Resources Conservation Service, and representatives of Ducks Unlimited and the Minnesota Waterfowl Association to advance this project. Restoration work was completed in 2014, and the lake was allowed to refill in 2015.

Tree Removal. There are approximately 70 acres of trees that would require removal on the northern half of the proposed site.

Residential Impact. While there would be a large amount of overflight, only one residence would require relocation.

Aircraft Noise. This location would place a residential area less than a mile from the runway. Overflight would occur when aircraft depart to or approach from the southeast. The nearby town of Frazee is located adjacent to the site and would be subject to a high level of noise. The potential future expansion of Frazee would present the possibility of further encroachment on the site.

Conclusion.

- **Advantages** – The nearby highway would provide access, while relatively even topography, and limited existing infrastructure.
- **Disadvantages** – Brink Lake would require partial infill and reverse work completed over the previous years. Large tracts of wetlands would be adjacent to the airport and overflight of surrounding communities would be inevitable.

1.1.6 Site Six

Site Six is situated six miles from the Detroit Lakes city center, adjacent to U.S. Highway 10 as shown in Exhibit B6 at the end of this memorandum.

Accessibility. The proximity of Highway 10 would allow for direct access capable of supporting any necessary traffic.

Existing Infrastructure. Power lines run through the length of the property from north to south and would need to be relocated, adding to the project cost.

Topography. The creek that feeds Stilke Lake lies in a deep depression running along the property from south to north. This depression varies in elevation of 65 feet or more across the area. Abrupt changes in elevation are present across the site. Maximum variation is approximately 150 feet.

Wildlife. Based on their online database, it appears the USFWS holds an easement for a WPA located a half mile to the north and a state forest less than a mile to the south. There are also approximately 100 acres of wetlands running east to west located immediately to the north of the proposed site.

Shoreland Buffer. This site would not affect any shoreland buffers though would require the infill of Stilke Lake, which is not considered public waters.

Wetlands. Approximately 30 acres of wetlands would be impacted at this site. As mentioned previously, Stilke Lake and associated wetlands would also need to be filled in.

Tree Removal. Over 330 acres of woodlands would need to be cleared, many of which are positioned within the ravine surrounding the stream that feeds Stilke Lake.

Residential Impact. The displacement of at least 20 residences would be necessary on the north side of the site along Carcow Circle and Whitney Lane. Residents less than a mile to the south of the proposed site, near Eagle Lake, would be subjected to direct overflight as discussed below.

Aircraft Noise. Residential areas of Detroit Lakes are located less than two miles northwest of the site. Noise concerns are very likely for residents to the north due to aircraft departing on Runway 31 or landing on 13. The residents to the south, surrounding Eagle Lake, would be less than a mile from the departure end of Runway 13.

Conclusion.

- **Advantages** – Highway 10 would provide excellent access to the site.
- **Disadvantages** – Construction would be notably difficult due to existing infrastructure and natural barriers. Power lines and a residential area are both located within the footprint of this site. Natural barriers include a nearby state forest, creek and lake infill, and uneven topography. This site would require large amounts of wetland fill and tree removal.

1.1.7 Site Seven

Site Seven is located approximately seven miles south of Detroit Lakes city center and less than one mile from Site Six as shown in **Exhibit B7** at the end of this memorandum.

Accessibility. Without major additional construction there are no major roads that service this area. The only direct connections to the proposed area are 125th Street and 280th Avenue, local roads which are not designed to accommodate major traffic. This would limit the functionality of the site unless improved or additional connections were made to U.S. Highway 10 over a mile east of the site.

Existing Infrastructure. The same power lines that run through Site Six also run across a large portion of Site Seven, in addition to an underground pipeline that crosses the southern section of the site. Both of these facilities would require relocation, as well as additional tree removal to accommodate their new locations.

Topography. Nearly 150 feet of elevation change exists between the low lying lands on the western half of the site compared to higher elevations to the east.

Wildlife. Based on their online database, it appears that two USFWS easements for WPAs are located approximately a mile and a half to the southwest. A state forest would be located less than ½ mile to the south.

Shoreland Buffer. This site would affect a small portion of the shoreland buffer of Senical Lake, a Natural Environment Lake to the north of the site which is a normally prohibited use as previously discussed.

Wetlands. Less than five acres of wetlands would be affected at this site, as the majority of the area is forested upland.

Tree Removal. Tree removal would be substantial as approximately 250 acres of the site is covered by woodland.

Residential Impact. Approximately five residences would be displaced at this site.

Aircraft Noise. Similar to Site Six, residential development to the north around Abbey Lake and Detroit Lake would cause overflight and subsequent noise concerns. There is sparse residential development to the west but all other areas are virtually undeveloped.

Conclusion.

- **Advantages** – This site would have limited wetland and residential impacts compared to many of the other alternatives.
- **Disadvantages** – As most of the area consist of trees and uneven topography, construction would be challenging. Tree removal may impact ESA listed species. Additionally, power lines and a pipeline would have to be rerouted to avoid interference with the airport. Numerous wildlife areas surround the site and wildlife is expected to be a concern. Finally, some nearby residences would require displacement and the remaining communities would be subjected to overflight noise.

1.2 Conclusion

The seven alternate sites are compared in **Table 2** on the next page. An “x” designates an obstacle at that site and a blank space represents either the absence of the concern or, if it is present, that it can be mitigated and is not a prominent problem *when compared to other sites*. It should be noted that nearly all challenges exist on a spectrum and that any site may have unique challenges not represented on the table.

As evident in Table 2, each site has multiple challenges. The large amount of USFWS interest areas and wetlands prevent identification of a site free of wildlife concerns. Sites with few constructability concerns (topography, few or absent wetlands, few trees, and a lack of wildlife attractants) are generally surrounded by existing development and primary concerns are protection of Safety Zones, future encroachment, and noise sensitivity. Inversely, sites with natural barriers (abundance of wetlands, wildlife attractants, topographic challenges, and trees) are often in undesirable locations with poor access.

| Table 2: Comparison of Sites by Category | | | | | | | |
|---|-------------|------------|--------------|-------------|-------------|------------|--------------|
| Category | Site | | | | | | |
| | One | Two | Three | Four | Five | Six | Seven |
| Accessibility | | | x | | | | x |
| Existing Infrastructure | x | x | x | x | | x | x |
| Topography Variation (feet) | 110 | 90 | 100 | 80 | 30 | 150 | 150 |
| Wildlife Attractants | x | x | x | x | x | x | x |
| Shoreland Buffer | x | | x | x | x | | x |
| Wetlands (acres) | 60 | 65 | 45 | 50 | 100 | 30 | <5 |
| Tree Removal (acres) | 230 | 220 | 650 | 350 | 70 | 330 | 250 |
| Residential Impact | x | x | x | x | | x | x |
| Aircraft Noise | x | | | x | x | x | |

In conclusion, the abundant natural resources of the Detroit Lakes area that attract businesses, residents, and tourists, simultaneously present challenges to constructing a brand new airport. Therefore, this re-evaluation analysis agrees with the 2004 study that there is not a viable alternative airport site preferable to the existing site, when considering comparative environmental impacts.