APPENDIX A

Airport Background Information

AIRPORT BACKGROUND INFORMATION

Community and Airport Background

The St. Michael Airport is located approximately 2.2 miles west of the community of St. Michael, on the east coast of St. Michael Island in Norton Sound. The island is separated by a series of natural canals that are no more than 1,000 feet wide at their largest width. St. Michael lies 125 miles southeast of Nome at approximately 63.47° north latitude and 162.03° west longitude (U.S. Geological Survey Quad St. Michael C-1, Section 24, Township 23 South, Range 18 West, Kateel River Meridian).

St. Michael is only accessible by air and sea in the summertime, and additionally by snow machines in the wintertime. St. Michael is connected by road to the community of Stebbins, which has its own airport. Lighterage service is provided on a frequent basis from Nome, and St. Michael and receives at least one annual shipment of bulk cargo.

The St. Michael Airport is a Community Class Airport, which is defined by the AASP as the primary land and water access point to a small rural community of at least 25 permanent year-round residents, without other reliable year-round access. The current St. Michael ALP identifies St. Michael Airport as having a reference code of B-II.

The existing general aviation airport at St. Michael does not meet safety guidelines as outlined in the AASP and FAA Advisory Circular 150/5300-13, due to a number of existing deficiencies.

The DOT&PF, in cooperation with the FAA, is proposing a project to rehabilitate the runway, runway safety area, taxiway, taxiway safety area, apron, airport lighting, and access road at the St. Michael Airport in St. Michael, Alaska.

Fleet Mix

Each aircraft is divided into an aircraft approach category, which is a grouping of aircraft based on 1.3 times their stall speed in their landing configuration at their maximum certified landing weight. These categories range from Category A, speed less than 91 knots, to Category E, speed of 166 knots or more.

Current aircraft that use the St. Michael runway include B-II or larger aircraft, but several of these aircraft are not able to land or take off fully loaded with the runway at its current length.

The St. Michael Airport serves a combination of A-I, A-II, B-I, B-II, B-III, and C-IV Airplane Design Groups. Aircraft serving the area include the following:

Table A-1: Current Fleet Mix

Current Aircraft	ARC
Casa C-207A Azor	B-III
Cessna 208 Caravan	A-II
Piper 31-310 Navajo	B-I
Cessna 406	B-I
Beech King Air	B-II
Beech Airliner 1900-C	B-II
MDC DC-6 (on occasion)	B-III
Lockheed C-130 (on occasion)	C-IV
Casa 212 (on occasion)	A-II
Sherpa SD330 (on occasion)	B-II
Boeing 727 (on occasion)	C-III

The projected fleet mix is shown on Table A-2:

Table A-2: Projected Fleet Mix

Projected Aircraft	ARC
Beech Airliner 1900-C	B-II
MDC DC-6	B-III
Casa C-207A Azor	B-III
Beech King Air	B-II
Sherpa SD330	B-II
Piper 31-310 Navajo	B-I
Beech Airliner C99	B-I
Lockheed C-130	C-IV
Boeing 737/727	C-III

It should be noted that this projected fleet mix is based on aircraft serving a 5,000-foot runway. Since the runway will not be lengthened at this time, no significant changes in the fleet mix are expected.

According to the Northwest Alaska Transportation Plan (AKDOT&PF, 2004), a B-II runway and B-III taxiway should meet transportation needs until 2025.

Current Airport Deficiencies

The existing general aviation airport at St. Michael does not meet safety guidelines as outlined in the AASP and FAA Advisory Circular 150/5300-13. The purpose of this project is to rehabilitate the St. Michael Airport to address the following deficiencies:

- The existing runway surface is depleted and damaged due to differential settlement at the shoulder resulting from permafrost degradation beneath the embankment. This settlement has caused large longitudinal and transverse cracks in the runway. Although no scientific evidence demonstrates it, DOT&PF experience suggest that shallower slopes do reduce permafrost degradation. In addition, shallower slopes will improve stability of the slope and provide safer conditions for airport users.

Photograph A-1:
Longitudinal Cracks on Runway Embankment caused by Permafrost Degradation

- Both the RSA and TSA width does not meet current FAA safety guidelines for aircraft using the runway and has also been damaged due to differential settlement resulting from permafrost degradation beneath the embankment. (RSAs are defined as the areas surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.) The FAA AC 150/5300-13 recommends an RSA width of 150 feet and 300 feet beyond the length of the runway ends. Currently the RSA is only 120 feet wide.
- The taxiway at St. Michael Airport is 400 feet long and 35 feet wide, with a safety area width of 79 feet. The FAA recommends taxiways have a minimum width of 50 feet, with a minimum safety area width of 118 feet. This proposed design is to accommodate Design Group B-III (wingspan of 79 to 117 feet) aircraft.
- The existing runway safety area side slopes do not meet current FAA guidelines for maximum slope angle, and need to be flattened.
- The current St. Michael ALP identifies the St. Michael Airport as having an ARC of B-II (Appendix H). FAA safety guidelines recommend B-II airports to have 75-foot-wide runways and 150-foot-wide safety areas. RSAs are recommended to be 300 feet beyond the end of the runway.
- The MIRL needs to be replaced, as it has been damaged due to differential settlement within the embankment. The lighting at St. Michael was last replaced in 1996 with the St. Michael Airport Improvements Project/AIP 3-02-0276-02/64405. Longitudinal cracking in the runway and safety area embankment has exposed the lighting electrical system in places. The RSA needs to be widened, requiring replacement and relocation of the existing lights.
- The existing 150,000 square foot apron and aviation support area is congested, and needs to be expanded to meet the demands of increased aviation activity. Additionally, the apron has longitudinal and transverse cracks caused by differential settlement within the embankment.
- The airport access road is 20 feet wide and has sustained damage due to differential settlement, such as longitudinal and transverse cracks. Additionally, the inside

(SW section) of the sharp curve is eroding due to overly steep side slopes and possible groundwater infiltration. Widening the airport access road would protect the embankment from further thermal degradation.

- PAPI and REILs are needed, and pads need to be constructed. PAPI lights are a series of four lights placed on the left hand side of the runway to help pilots adjust their glide path to the airport. The PAPI lights are constructed of an optical apparatus that change colors (white to red) depending on the angle from which the lights are viewed. If the glide path is too low, the lights will be all red. Too low, and the lights will be all white. An ideal glide path will show two white and two read lights. REILs consist of flashing (strobe-like) lights placed laterally at each corner at the end of the runway. These lights help define the runway when visibility is poor or when the runway lacks contrast with the surrounding terrain.
- The aircraft operational services currently generate a high amount of dust during operating periods. A dust palliative is needed to reduce the loss of surfacing materials and to improve air quality.
- Currently, water is ponding around the edges of the runway embankment. Drainage improvements need to be constructed to drain the water away from the runway.

Proposed Action

The proposed action would involve widening the RSA, widening the taxiway and TSA, rehabilitating the airport operational surfaces, flattening the side slopes of the runway, expanding the apron and aviation support area, and improving drainage. Additionally, airport lighting will be replaced, PAPI and REIL pads would be constructed, and the airport access road would be realigned and widened.

In order to meet FAA safety guidelines, the runway will be upgraded to B-II Standards, and the taxiway will be upgraded to B-III Standards.

By upgrading the runway to B-II Standards, large aircraft can access the runway and the B-III taxiway will provide better access to the apron.