# Scammon Bay Airport Planning Study

**February 2024**

**Forecast, Inventory, Issues, Facility Requirements**

**CFAPT01005 / AIP 3-02-0255-005-2023**

**Prepared for:**

State of Alaska
Department of Transportation & Public Facilities, Central Region
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# EXECUTIVE SUMMARY

The Central Region of the Alaska Department of Transportation and Public Facilities (DOT&PF) is conducting an airport planning study for the Scammon Bay Airport (SCM). The purpose of this project is to improve the safety of aviation infrastructure in Scammon Bay.

This report discusses the aviation activity forecast for Scammon Bay Airport and describes the purpose of a forecast and the methods used to gather and analyze the data considered. Aviation activity trends and results of previous forecasts will be summarized and compared to the findings of this forecast. The results of this forecast will be considered in the development of the Scammon Bay planning study.

The purpose of an aviation activity forecast is to:

1) Establish the current operational demands of the airport.
2) Evaluate historic airport uses and trends that affect aviation activity at the airport.
3) Forecast future operational demands based on the current demand and historic trends.

Scammon Bay Airport is a public DOT&PF-owned Commercial Service – Non-Primary, Community Off-Road airport. The airport has a single, gravel, 3,000-foot-long, 75-foot-wide runway. The airport has regularly scheduled passenger service from Grant Aviation and Ryan Air, primarily flying Cessna 208 Caravans and Casa C212s.

The major issue facing the Scammon Bay Airport is flooding, which is destabilizing the airport surface and embankment, submerges the lighting system and navigational aids, and results in airport closures. The closures prevent residents from being able to evacuate during emergencies, access emergency medical services, send or receive mail, or have food and fuel delivered.

A current forecast was developed for the Scammon Bay Airport. The forecasted activity levels at the airport establish that the existing and future Aircraft Approach Category (AAC) and Airplane Design Group (ADG) is B-II (S), and the designated Critical Aircraft are the Cessna C208 Caravan and Piper PA-31 (Navajo).

The current facility was compared with the airport design standards for the current forecasted Critical Aircraft, which is AAC and ADG B-II (S). Detailed recommendations are discussed in Section 5, and include extending the length of the runway to 3,200 feet to be in compliance with the Federal Aviation Administration (FAA) recommendations for instrument approaches.

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| | |
|---|---|
| °F | Degrees Fahrenheit |
| % | Percent |
| AAC | Aircraft Approach Category |
| AC | Advisory Circular |
| ADG | Airplane Design Group |
| AIP | Airport Improvement Program |
| ALP | Airport Layout Plan |
| ARC | Airport Reference Code |
| AWOS | Automated Weather Observation System |
| Casa C212 | Casa/Nurtanio C212 Aviocar |
| CTAF | Common Traffic Advisory Frequency |
| DOT&PF | Department of Transportation and Public Facilities |
| FAA | Federal Aviation Administration |
| FAR | Federal Aviation Regulation |
| FEMA | Federal Emergency Management Agency |
| GA | General Aviation |
| GPS | Global Positioning System |
| IFR | Instrument Flight Rules |
| LRRS | Long Range Radar Station |
| MGW | Main Gear Width |
| MIRL | Medium Intensity Runway Lights |
| MSL | Mean Sea Level |
| NAVAID | Navigational Aid |
| OFZ | Obstacle Free Zone |
| RCAG | Remote Center Air/Ground |
| RNAV | Area Navigation |
| ROFA | Runway Object Free Area |
| ROFZ | Runway Object Free Zone |
| RPZ | Runway Protection Zone |
| RSA | Runway Safety Area |
| SCM | Scammon Bay Airport |
| SREB | Snow Removal Equipment Building |
| RW | Runway |
| TAF | Terminal Area Forecast |
| TDG | Taxiway Design Groups |
| TOFA | Taxiway Object Free Area |
| TSA | Taxiway Safety Area |
| TSS | Threshold Siting Surfaces |
| USBTS | U.S. Bureau of Transportation Statistics |
| USFWS | U.S. Fish and Wildlife Service |
| VFR | Visual Flight Rules |

# 1 INTRODUCTION

The Central Region of the Alaska Department of Transportation and Public Facilities (DOT&PF) is conducting an airport planning study for the Scammon Bay Airport (SCM) (Figures 1-1, 1-2, 1-3, 1-4).

Scammon Bay is located along the Kun River lowlands and the foothills of the Askinuk Mountains. The Kun River provides important transportation connections downriver to the bay and upriver to summer fish camps. The community port, and adjacent riverbanks, are populated with numerous small boats, which facilitate transportation and subsistence activities.

The population of Scammon Bay is 98 percent (%) Alaska Native, making it an environmental justice population. The community was known in Cup'ik as Maraayaq, and residents were known as Maraayarmiut. Scammon Bay is represented by the Calista Regional Corporation and Askinuk Village Corporation. It is also part of the Association of Village Council Presidents.

Scammon Bay residents live, at most, 0.7 miles away from the Airport. This proximity is important because most residents arrive at the Airport on foot, or in open-air, off-road vehicles. There is no passenger shelter at the Scammon Bay Airport. During inclement weather, residents listen for their aircraft and then travel to the Airport. Flights also arrive at unexpected times, and residents may be affected by irregular flight schedules.

The Scammon Bay Airport provides the only year-round access to other communities and emergency health care infrastructure. There are no roads connecting Scammon Bay to other communities. During the summer, Scammon Bay is accessible by air and water. Barge service remains an important transportation mode for goods during the summer. During the winter, transportation can occur via air or over snow/ice. Air travel is the only way to reach the hub community of Bethel (150 miles away) throughout most of the year.

The Scammon Bay Airport experiences flooding and high water events, which causes airport closures and damages infrastructure. The Airport plays a vital role in the daily life of the residents of Scammon Bay. Flooding on the runway affects pilot control, prevents residents from being able to access emergency medical services, delivery of food, medical supplies, and fuel. In Scammon Bay, the Yukon Kuskokwim Health Corporation runs a community health center, with itinerant nursing visits. Any emergency medical care must be sought in Bethel or Anchorage.

Table 1-1 provides documentation of the history of storm damage in Scammon Bay. Figure 1-5 provides a visual illustration of the flooded airport.

**Table 1-1 List of Scammon Bay Storms**

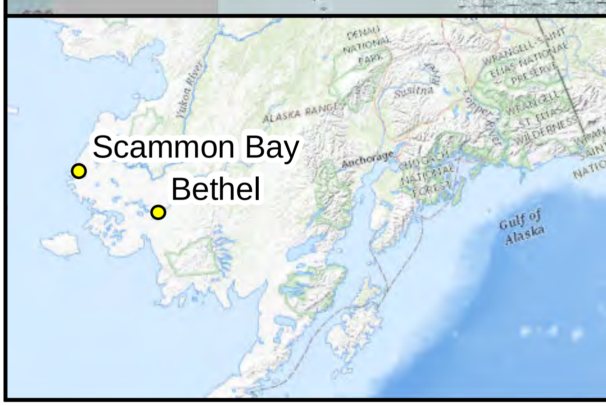
| Date | Event | Description | FEMA Declared Disasters |
|---|---|---|---|
| **1976 (August)** | Storm surge flood | Storm surge flood from Bering Sea. Flooded the airstrip, sewage lagoon, and two homes | No |
| **1977** | Flood | High wind driven waves | No |
| **1981** | Flood | Wind driven waves | No |
| **1982** | Flood | Wind driven waves | No |
| **2004 (October)** | Storm | High-water levels flooded airport | Yes |
| **2011 (November)** | Coastal Flood | Storm caused water levels to rise significantly in the lower Yukon River with high-water levels at Scammon Bay | Yes |
| **2013 (November)** | Coastal Flood | Significant washout of roads and airport | Yes |
| **2016** | Flood | Flooding of airport and roads | No |
| **2022 (September)** | Storm | High-water levels flooded airport | Yes |

Key:

FEMA – Federal Emergency Management Agency

Source: City of Scammon Bay, 2013; NOAA 2023; FEMA 2023

To coordinate the community's planning for building resilient aviation infrastructure, the need exists for an airport planning study to review the feasibility of potential alternative locations of the Airport and compare them to the current site. This study will analyze data for existing conditions to compare the conditions and costs of the airport alternatives, to determine a feasible alternative.


SCAMMON BAY
AIRPORT PLANNING STUDY

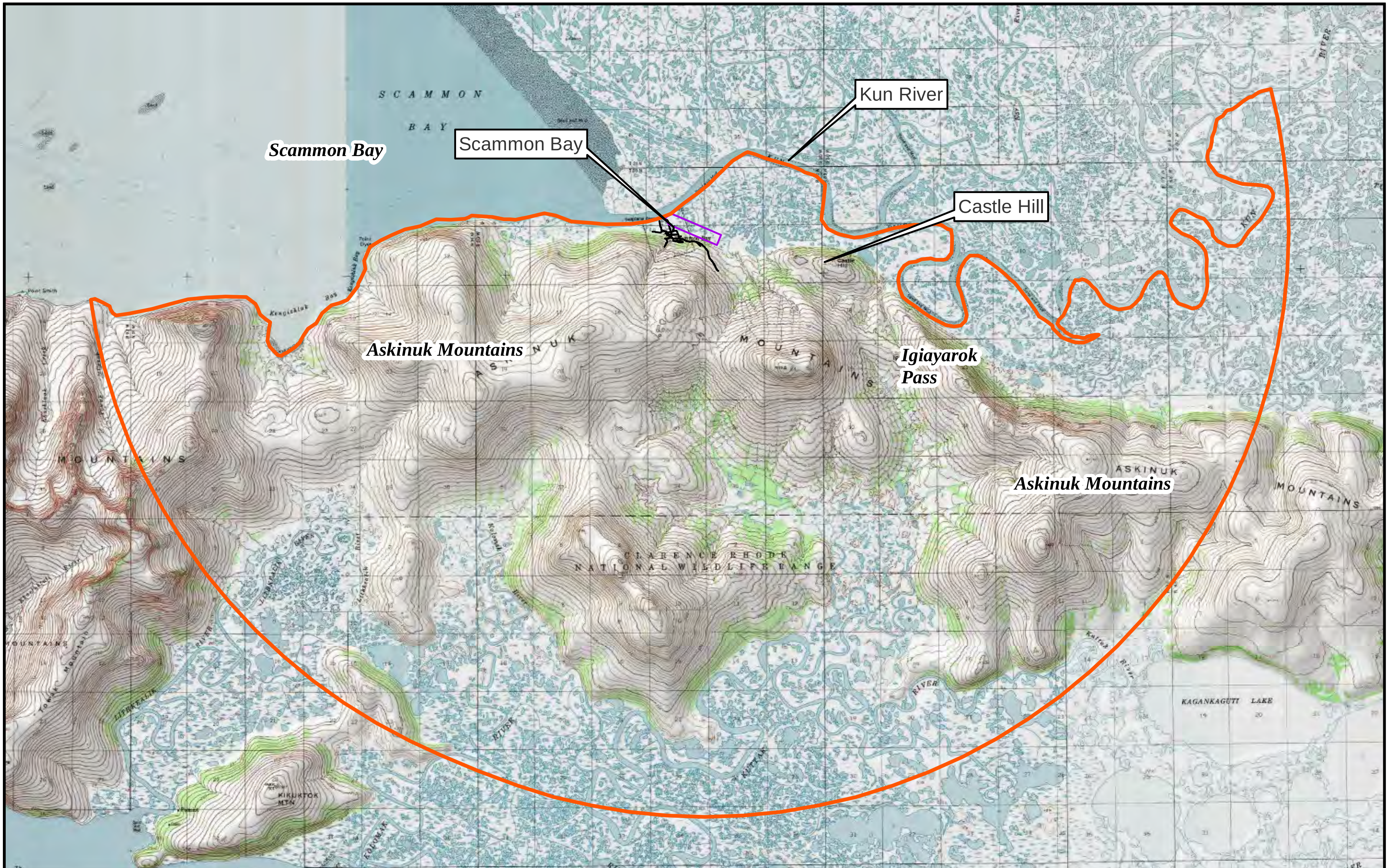
November 2023

STATE OF ALASKA
Department of Transportation and Public Facilities
4111 Aviation Ave, Anchorage, Alaska 99516

0 3.25 6.5 13 Miles
1:400,000 (at original document size of 8.5x11)

Figure 1-1: Project Location and Vicinity Map

\\us0308-ppfss02\shared_projects\203723395\03_data\gis_cad\gis\mxds\exiting conditions\fig_1.1_loc_vic.mxd Revised: 2023-11-07 By: rycooper



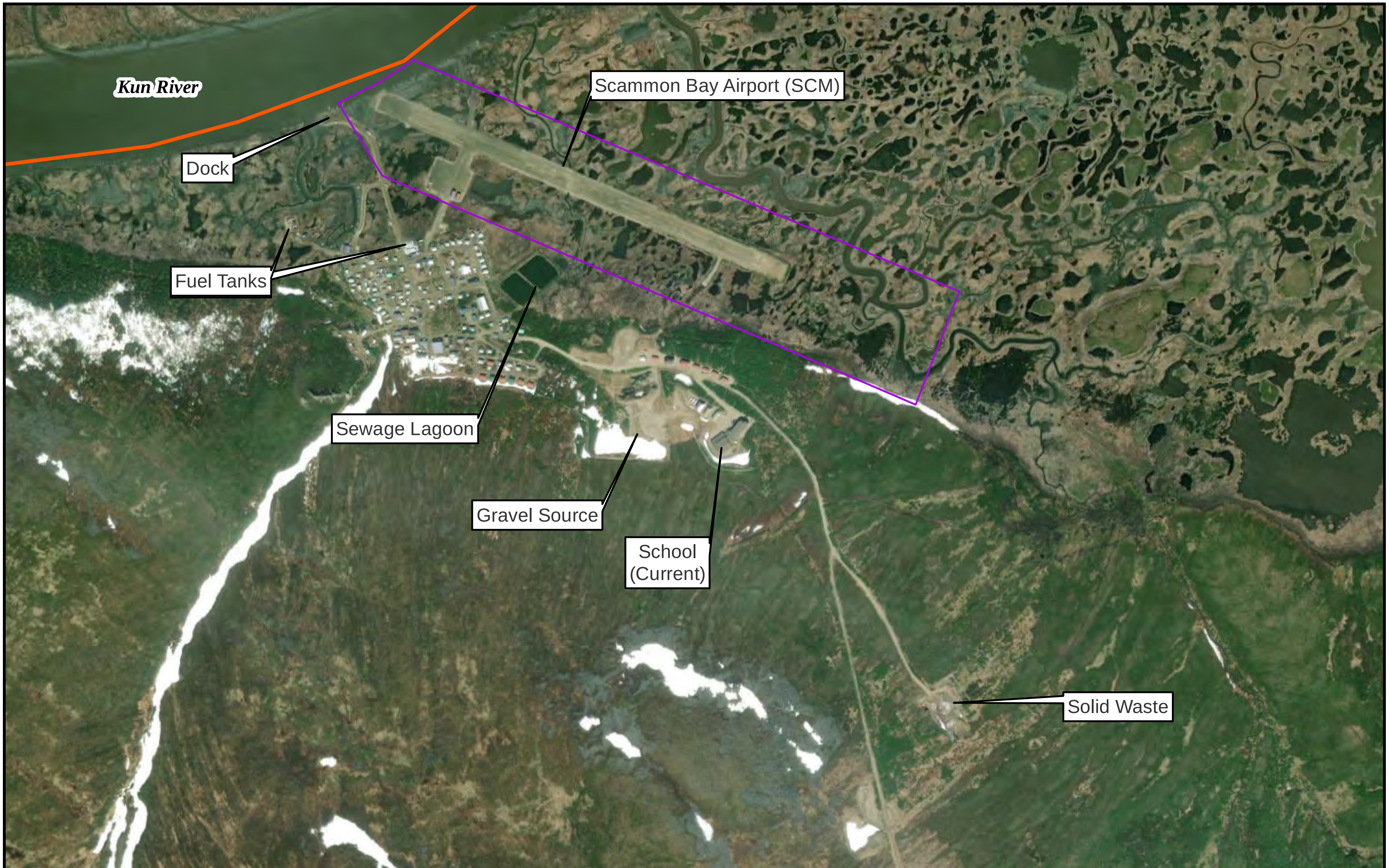

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

SCAMMON BAY
AIRPORT PLANNING STUDY

STATE OF ALASKA
Department of Transportation and Public Facilities
4111 Aviation Ave, Anchorage, Alaska 99516

January 2024

Figure 1-2: Study Area




N

0 0.2 0.4 Miles

1:13,597 (At original document size)

Study Area
Airport Boundary
Road

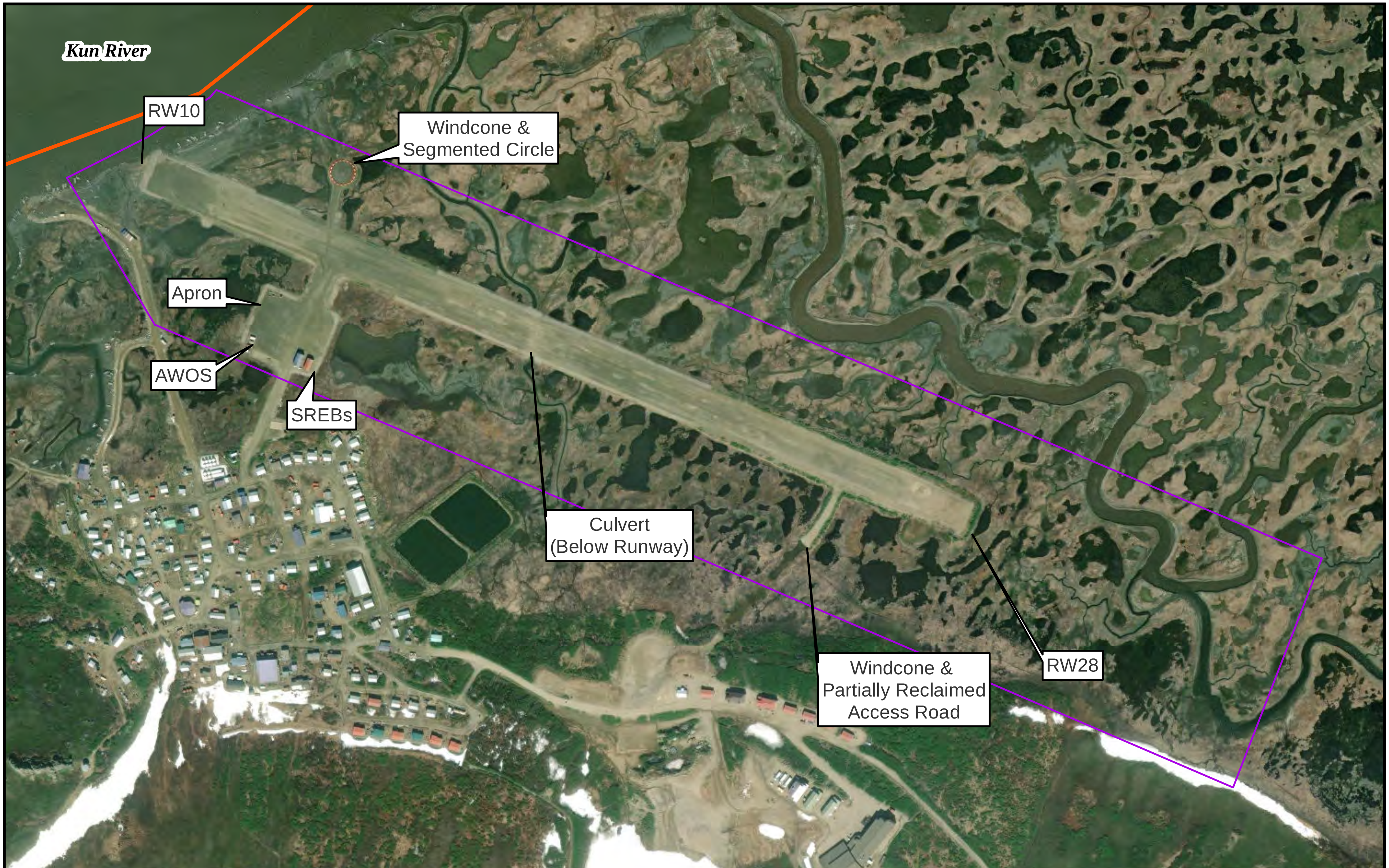
**Notes:**
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

SCAMMON BAY
AIRPORT PLANNING STUDY

STATE OF ALASKA
Department of Transportation and Public Facilities
4111 Aviation Ave, Anchorage, Alaska 99516

November 2023

Figure 1-3: Scammon Bay




N

0 0.1 0.2 Miles

1:6,731 (At original document size)

Study Area

Airport Boundary

SCAMMON BAY
AIRPORT PLANNING STUDY

STATE OF ALASKA
Department of Transportation and Public Facilities
4111 Aviation Ave, Anchorage, Alaska 99516

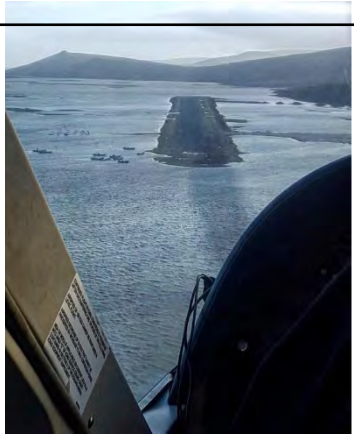
January 2024

Figure 1-4: Scammon Bay Airport (SCM)

**Notes:**
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet
SREB: Snow Removal Equipment Building
AWOS: Automated Weather Observation System

**Figure 1-5  Scammon Bay Airport Flood Pictures**

*2004 flooding of the runway is evident in the middle of the picture (DGGS, 2023a). Note the two (red and blue) airport snow removal equipment buildings on the airport apron.



*2016 flooding of airport from view of an approaching aircraft

*2022 flooding of the runway (DGGS, 2023b). Note the two (red and blue) airport snow removal equipment buildings on the right side of the picture.

*Low resolution 1994 view of airport from a similar vantage as the 2004 and 2022 pictures (DCRA, 1994).

# 2 INVENTORY

SCM is a public DOT&PF-owned Commercial Service – Non-Primary, Community Off-Road airport. It is not a Federal Aviation Regulation (FAR) Part 139 certificated airport and only serves FAR Part 135, air taxi operations. SCM operates with regularly scheduled passenger service from Grant Aviation and Ryan Air, primarily flying Cessna 208 Caravans and Casa/Nurtanio C212 Aviocar (Casa C212).

SCM has a single, gravel, 3,000-foot-long, 75-foot-wide runway, with medium-intensity runway edge lights. The runway is listed as soft during 'breakup, after rains, and high tides,' with large rocks. The runway is subject to flooding from the adjacent Kun River.

## 2.1 Funding Background

The Federal Aviation Administration (FAA) has funded 16 Airport Improvement Program (AIP) projects for the facility. The history of AIP grant-funded projects is summarized in Table 2-1.

The Airport land was acquired through the AIP program in 1991 (Grant 3-02-0255-001-1991). When accepting FAA grants to complete airport improvements, the airport owner agrees to maintain compliance with FAA grant assurances from the date of acceptance of a grant for airport development (such as runway rehabilitation) for the minimal useful life of the development, from the date the improvement was completed. The length of those grant assurances depends on the type of project, per Table 3-7 of the FAA Airport Improvement Handbook (Order 5100.38D, Change 1). However, the grant obligations for land ownership are unlimited. The grant obligations will impact planning for airport relocation, as the airport must be operated throughout its grant obligation cycle.

The Federal Emergency Management Agency (FEMA) provided funding for Scammon Bay in 2013 to bring the Airport back to pre-flood conditions. FEMA also provided funding for a Hazard Mitigation Plan, which made the community eligible to apply for additional FEMA funding.

**Table 2-1 Airport Improvement Program at SCM**

| Year | Grant Number | Description | Grant Agreement Date | Grant Close Date | Grant |
|---|---|---|---|---|---|
| **2022** | 3-02-0255-004-2022 | Seal Runway Pavement Surface/Pavement Joints | 9/12/2022 | | $1,065,829 |
| **2022** | 3-02-0255-004-2022 | Seal Apron Pavement Surface/Pavement Joints | 9/12/2022 | | $391,095 |
| **2022** | 3-02-0255-004-2022 | Seal Taxiway Pavement Surface/Pavement Joints | 9/12/2022 | | $48,887 |
| **2017** | 3-02-0200-115-2017 | Install Miscellaneous NAVAIDS, Remove and Replace Rotating Airport Beacon and Airport Beacon Tower. | 9/21/2017 | 1/31/2022 | $211,837 |
| **2015** | 3-02-0200-101-2015 | Acquire Snow Removal Equipment | 9/21/2015 | 11/18/2021 | $365,238 |
| **2012** | 3-02-0200-087-2012 | Rehabilitate Runway 10/28<br>Various Surface Preservation Maintenance | 9/19/2012 | 1/9/2019 | $10,500 |
| **2009** | 3-02-0200-069-2009 | Rehabilitate Runway 10/28 | 8/20/2009 | 12/19/2014 | $532,000 |
| **2007** | 3-02-0200-060-2007 | Rehabilitate Runway 10/28 | 5/31/2007 | 8/6/2013 | $211,736 |
| **2003** | 3-02-0255-002-2003 | Construct Snow Removal Equipment Building | 8/4/2003 | 8/17/2007 | $753,265 |
| **1991** | 3-02-0255-001-1991 | Construct Taxiway | 8/20/1991 | 6/21/1993 | $24,567 |
| **1991** | 3-02-0255-001-1991 | Improve Snow Removal Equipment Building | 8/20/1991 | 6/21/1993 | $77,011 |
| **1991** | 3-02-0255-001-1991 | Install Runway Lighting | 8/20/1991 | 6/21/1993 | $100,077 |
| **1991** | 3-02-0255-001-1991 | Rehabilitate Runway 10/28 | 8/20/1991 | 6/21/1993 | $1,323,145 |
| **1991** | 3-02-0255-001-1991 | Acquire Land for Development | 8/20/1991 | 6/21/1993 | $77,011 |
| **1991** | 3-02-0255-001-1991 | Acquire Snow Removal Equipment | 8/20/1991 | 6/21/1993 | $104,421 |
| **1991** | 3-02-0255-001-1991 | Construct Apron | 8/20/1991 | 6/21/1993 | $122,136 |

Key:
NAVAIDS – Navigation Aids
SCM – Scammon Bay Airport

Source: Alaska Aviation System Plan

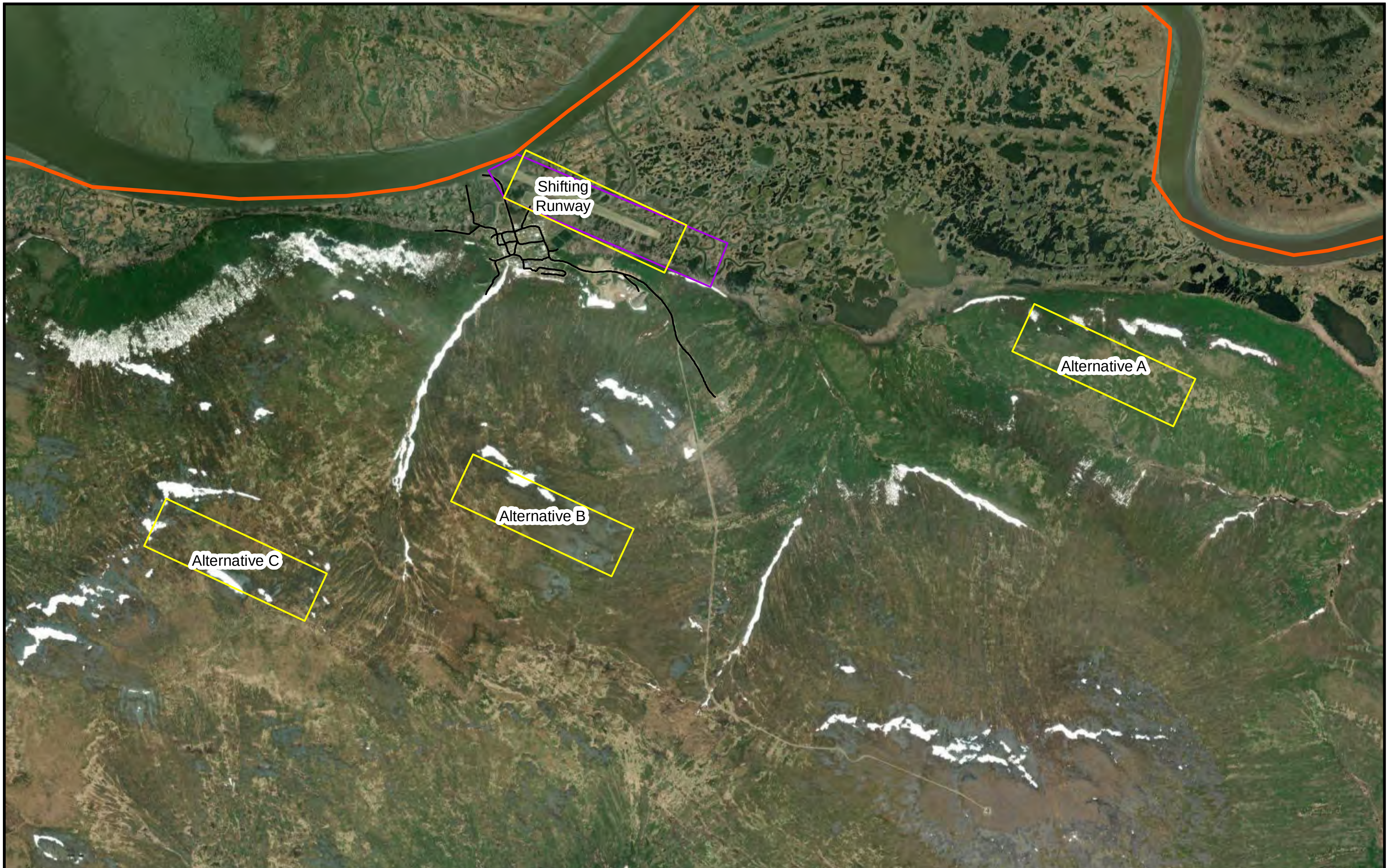
### *2.1.1 Past Planning Efforts*

#### *2.1.1.1 2019 Planning*

In 2019, DOT&PF conducted an Alternative Analysis for relocating the Airport in response to flooding. Alternatives included (with cost estimates from the 2019 report) (Figure 2-1):

- No Action
- Elevation of Current Runway ($20 million)
- Shifting the Runway ($25 million)
- Shifting the Runway (with reconstruction of apron/haul road) ($30 million)
- Relocating the Airport (three alternatives, $40-60 million)
    - Alternative A: Castle Hill or Adjacent Valley
    - Alternative B: Central Askinuk Mountain Peaks and Valley Areas
    - Alternative C: Western Mountain

The recommended Alternative was Shifting the Runway (with reconstruction of apron/haul road). This was favored because relocating the Airport was determined to be less convenient for the community and would have had greater environmental impacts. Cost was also prohibitive for airport relocation, as was compliance with Part 77 surfaces. Fog and wind direction is also a concern for an airport relocated to a higher elevation. Airport relocation would also require land acquisition and a new access road.




N

0 0.3 0.6 Miles

1:35,278 (At original document size)

Study Area
Airport Boundary
2019 Alternative
Road

**Notes:**
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

SCAMMON BAY
AIRPORT PLANNING STUDY

STATE OF ALASKA
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November 2023

Figure 2-1: 2019 Airport Alternatives

#### *2.1.1.2 2022 Planning*

In 2022, HDR published a Coastal Report (HDR, 2022a) and a Hydrology and Hydraulics Report (HDR 2022b). The Coastal Report included discussion of a storm surge and wave analysis in service of provided recommendations for airport surface elevations, airport relocation, and erosion protection. HDR recommended a surface elevation of 18.5 feet, which would meet a 50-year storm return period with a 2% Annual Exceedance Probability. The current runway ranges between 10 and 17.5 feet in surface elevation. HDR recommended that the runway shift 340 feet along its current alignment to account for river movement over a 50-year period.

HDR also recommended different erosion protection strategies to resist the river movement and provided cost estimates for the different erosion protection strategies (Table 2-2).

**Table 2-2 Cost Summary of Armor Rock Revetments**

| Description | Cost |
|---|---|
| Buried-Toe 4H:1V Concept | $67.7M |
| Above-Ground Toe 2.5H:1V and 2H:1V Concept | $30.1M |
| Above-Ground Toe 2.5H:1V Concept | $30.9M |
| Above-Ground Toe 2H:1V Concept | $31.9M |
| Above-Ground Toe 1.5H:1V Concept | $33.3M |
| Buried-Toe 4H:1V Concept | $67.7M |

Key:
H – High
M – Million
V – Vertical
Source: HDR, 2022a

The Hydrology and Hydraulics Report (HDR, 2022b) describes the hydrologic and flood frequency characteristics of the area. The hydraulic analysis focuses on the cross-runway culvert and appropriate culvert sizing.

### *2.1.2 Role in National Aviation System*

SCM is listed as a Community Off-Road airport in the Alaska Aviation System Plan. The Airport is listed as Non-Primary, Commercial Service in the National Plan of Integrated Airport Systems. The Airport does not receive Essential Air Service or Part 139 service. The Airport is owned by DOT&PF, is not regularly staffed, and maintenance is completed by a contracted provider. There are new and old Snow

Removal Equipment Buildings (SREB), no passenger facilities, and no Airport Rescue Firefighting facility.

## 2.2 Airfield/Airspace

Scammon Bay had an Airport Layout Plan (ALP) updated in 2004 and As-Built in 2019 after the FEMA project. As a reminder, the Airport Design Advisory Circular (AC) was updated to FAA AC 150/5300-13B after 2019. Future Airport development will follow the latest edition of this AC.

### *2.2.1 Runways*

Per the 2004 ALP, SCM is categorized as an Airport Reference Code (ARC) A-II airport with an ultimate ARC of B-II. An A-II ARC indicates that the Airport typically serves aircraft with approach speeds of less than 91 knots and with wingspans between 49 and 78 feet or a tail height of 20 to 30 feet. The B-II classification is for aircraft with approach speeds greater than 91 knots and less than 121 knots.

SCM has a single, gravel runway which is 3,000 feet long and 75 feet wide (Figure 2-1). It is classified as a utility runway, typically accommodating aircraft of 12,500 pounds or less. The runway lies within 10 degrees magnetic alignment of 100/280 degrees and is designated Runway (RW) 10/28. Aircraft approaching from the west are said to be using RW 10 and RW 28 from the east.

The runway is effectively flat, with a reported elevation of 22 feet Mean Sea Level (MSL). The difference in elevation between runway ends is 5.5 feet. The runway surface is gravel with reported soft areas, particularly during spring breakup, heavy rains, or extreme high tides.

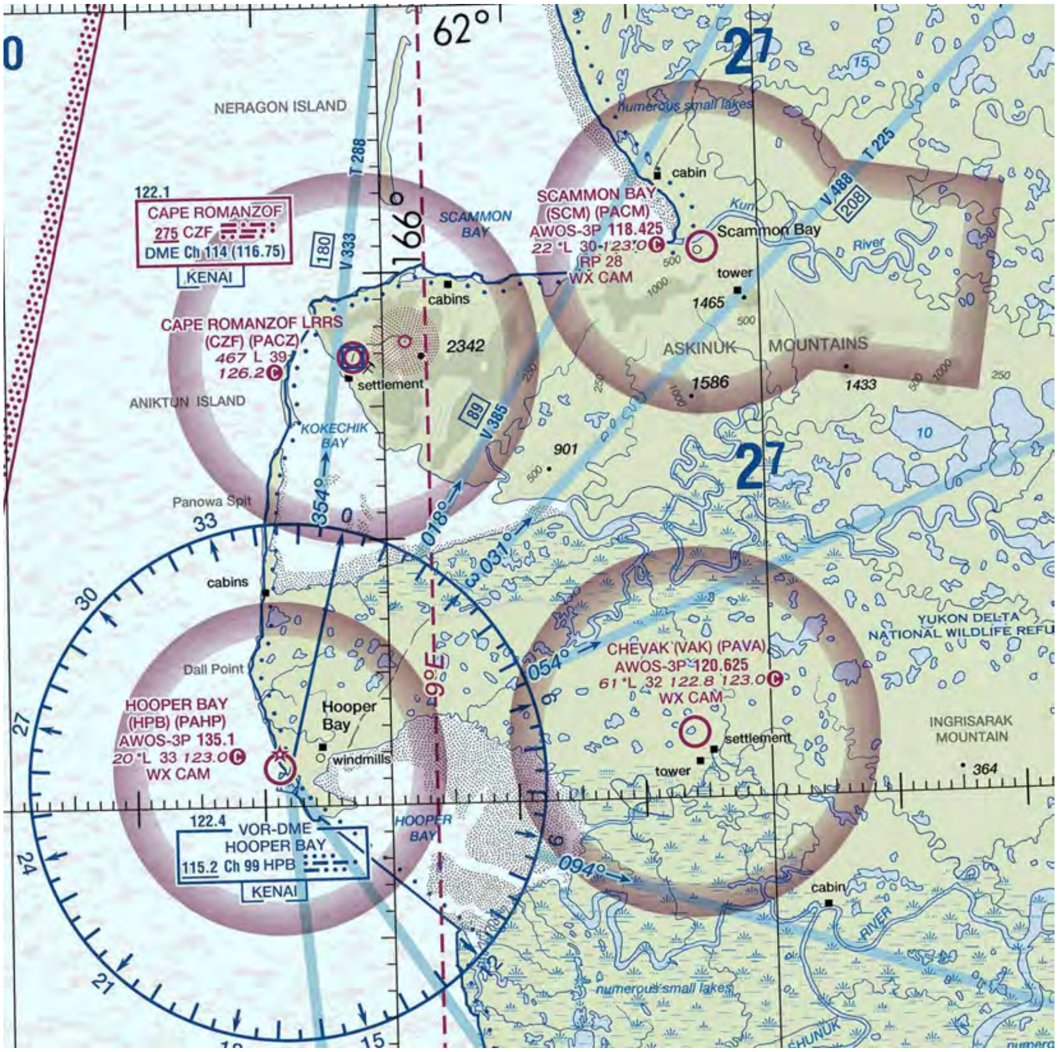
There is one non-standard condition shown on the ALP:

- Ultimate runway width of 100 feet, to account for wind coverage.

Rock revetments have been used to protect the runway from erosion along the Kun River, and a damaged culvert is located in the middle of the runway. The culvert allows for drainage under the runway.

Scammon Bay is located near three other community airports: Cape Romanzof Long Range Radar Station (LRRS) (15 miles), Hooper Bay (28 miles), and Chevak (22 miles) (Figure 2-2). Scammon Bay, Hooper Bay, and Chevak are served on the same passenger flight, from the hub of Bethel. Cape Romanzof LRRS is typically only visited by charter aircraft.

**Figure 2-2 SCM Sectional**




### *2.2.2 Taxiways*

SCM has one 35-foot-wide taxiway, which connects the Airport and the apron.

### *2.2.3 Aprons*

SCM has one apron, measuring 250 feet x 300 feet. This provides for the parking and loading/unloading of aircraft. The apron also houses the SREBs and an Automated Weather Observation System (AWOS) weather station. FAA support facilities are also located on the apron. Power is provided to the infrastructure on the apron from the community.

### *2.2.4 Safety Area, Object Free Area, and Object Free Zone*

The Runway Safety Area (RSA) is 150 feet x 3,600 feet, providing a cleared, graded, drained area for aircraft to occasionally operate off the runway.

The Runway Object Free Area (ROFA) is 500 feet x 3,600 feet, providing a clear area around the runway to protect aircraft during landing and takeoff. Objects in the ROFA must be constructed on frangible (breakable) mounted supports.

The Runway Object-Free Zone (ROFZ) is 250 feet x 3,400 feet. It is designed to provide protection to aircraft on landing and takeoff.

### *2.2.5 Lightings, Marking, and Signing*

The runway is lit with Medium Intensity Runway Lights (MIRL). There are no runway markings or navigation aids.

The windsock is lit but noted as unreliable. An unlit windsock is also present on the eastern portion of the runway.

### *2.2.6 Navigational Aids*

The Anchorage Air Route Traffic Control Center provides approach and departure service via the Cape Romanzof Remote Center Air/Ground (RCAG) on Frequency 124.5. The controllers are primarily concerned with Instrument Flight Rules (IFR) aircraft at an altitude greater than 18,000 feet.

At Scammon Bay, pilots communicate with other pilots and advise their intentions on the Common Traffic Advisory Frequency (CTAF) Frequency 123.0. The AWOS reports are broadcast on Frequency 118.425.

### *2.2.7 Visual Approach Aids*

Runway MIRL can be activated by the CTAF to provide increased visibility during periods of reduced visibility. MIRL are pilot-activated.

### *2.2.8 Instrument Approach Procedures*

SCM has three Area Navigation Global Positioning System (RNAV GPS) Non-Precision Instrument Approach Procedures. RNAV (GPS) RW 10 is an approach requiring that, at 1,100 feet MSL, there is 1.25 statue-mile visibility for Category A aircraft (Figure 2-3). RNAV (GPS) RW 28 is an approach requiring that at 900 feet MSL, there is 1.25 statue-mile visibility for Category A aircraft for Localizer Performance approaches (Figure 2-5). Both of these approach procedures provide obstacle clearance for terrain and other features with lower visibility minimums than Visual Flight Rules (VFR) approaches. In comparison, VFR flight requires a 1,000-foot ceiling and 3 statue-miles of visibility.

RNAV (GPS)-B is an approach requiring that at 760 feet, there is 2.25 statue-mile visibility for Category A aircraft (Figure 2-5). This approach provides a lower altitude option, by approaching from the north, but requires greater visibility than the other instrument approaches.

### *2.2.9 Airspace and Air Traffic Management*

The Part 77 surfaces from the 2004 ALP are as follows:

- Primary Surface: The Primary Surface is longitudinally centered on the runway and identical to the elevation of the nearest corresponding point on the runway centerline.
- Horizontal Surface: The Horizontal Surface is a horizontal plane 150 feet above the established airport elevation (for SCM, it is at 172 feet). The perimeter of the Horizontal Surface is established by swinging a 5,000-foot radius arc from the center of each end of the primary surface and connecting each arc with lines tangent to those arcs.
  - The Horizontal Surface at SCM is penetrated by terrain in multiple locations.
- Conical Surface: The Conical Surface is a surface extending outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 (horizontal to vertical) for a horizontal distance of 4,000 feet.
  - The Conical Surface at SCM is penetrated by terrain in multiple locations.

**Figure 2-3 Instrument Approach RNAV (GPS) RWY 10**

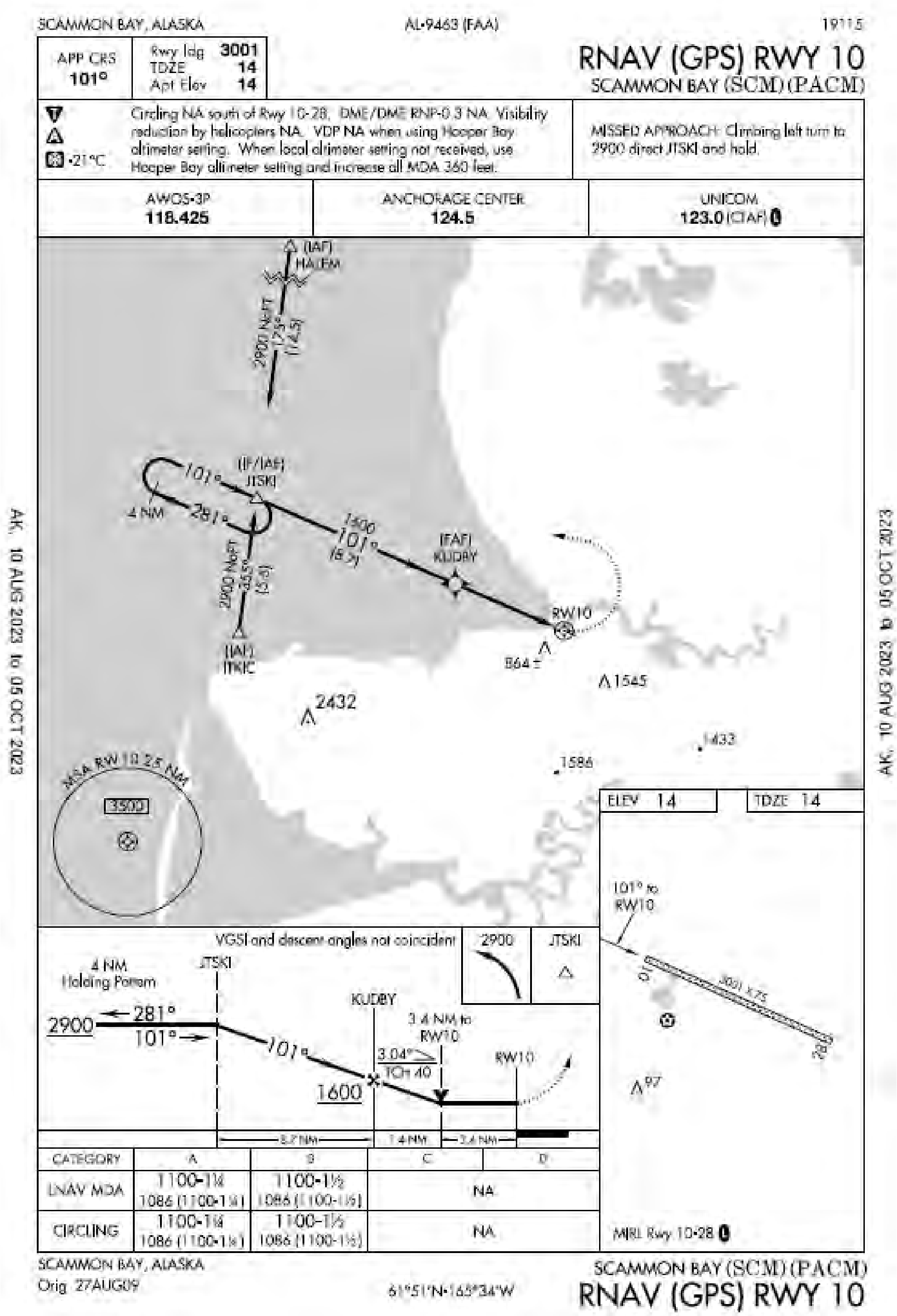
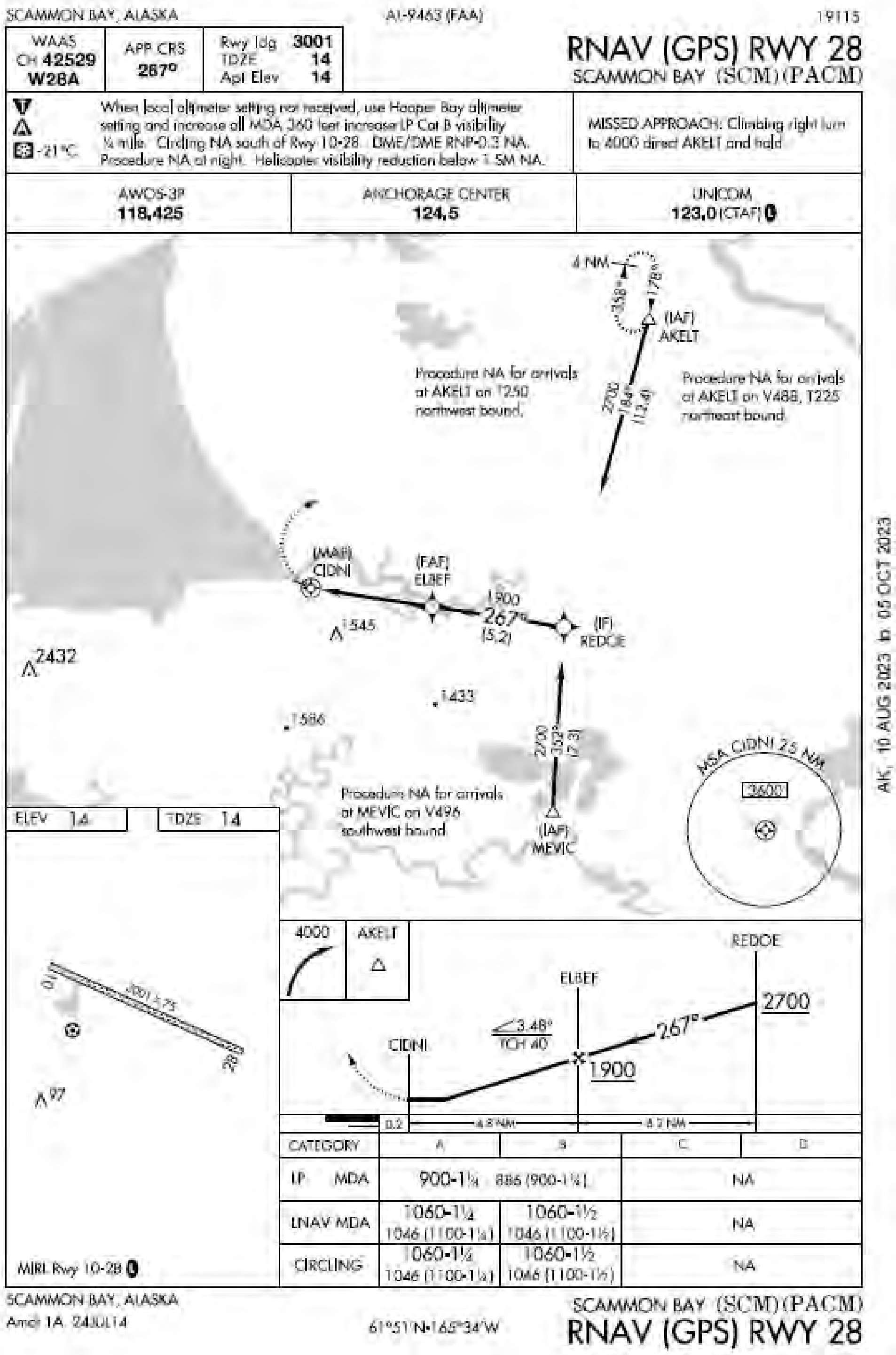
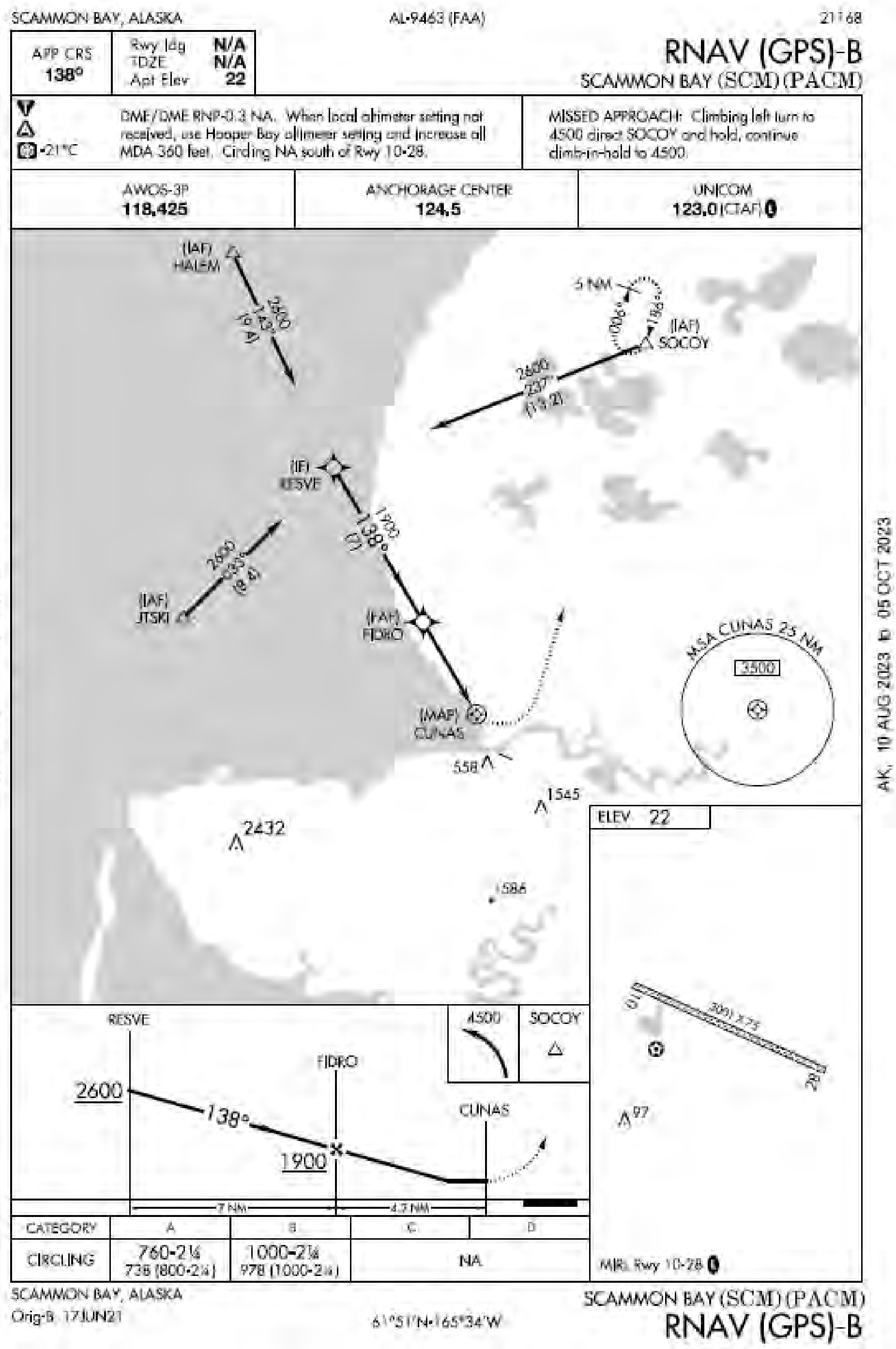


**Figure 2-4 Instrument Approach RNAV (GPS) RWY 28**




| CATEGORY | A | B | C | D |
|---|---|---|---|---|
| LP MDA | 900-1¼ 886 (900-1¼) | | NA | |
| LNAV MDA | 1060-1¼ 1046 (1100-1¼) | 1060-1½ 1046 (1100-1½) | NA | |
| CIRCLING | 1060-1¼ 1046 (1100-1¼) | 1060-1½ 1046 (1100-1½) | NA | |

**Figure 2-5 Instrument Approach RNAV (GPS)-B**



- Approach Surface: The Approach Surface is longitudinally centered on the extended runway centerline and extends outward and upward from each end of the Primary Surface. The ultimate surface for both runways is 34:1.
- Transitional Surface: The Transitional Surfaces extend outward and upward at right angles to the runway centerline and the extended runway centerline at a slope of 7:1 (horizontal to vertical) from the sides of the Primary and Approach Surfaces to the Horizontal Surface.

### *2.2.10 Weather*

SCM is equipped with an AWOS and an internet accessible webcam system (Figures 2-6 and 2-7). The AWOS measures precipitation in addition to collecting visibility, cloud, and ceiling data. A lighted windsock is present opposite of the apron, outside of the ROFA. An unlighted windsock is present on the eastern portion of the runway.

**Figure 2-6 Northeast and East (right) Views from Scammon Bay (FAA, 2023a)**

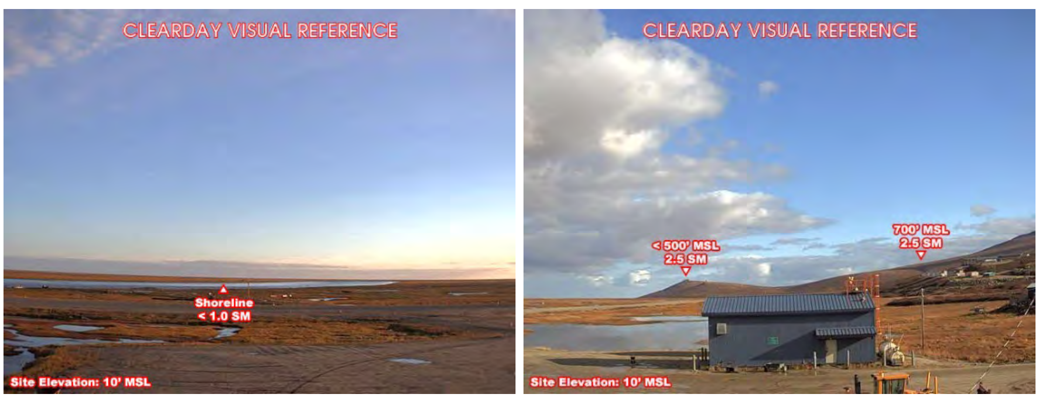
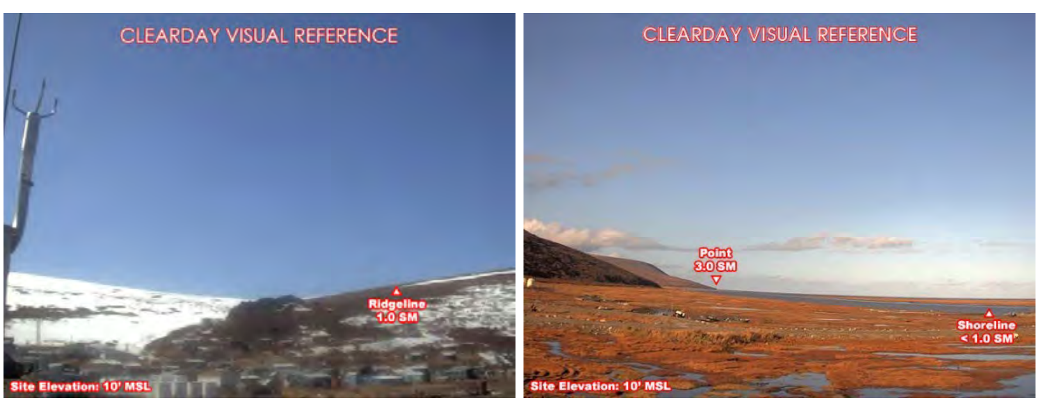



**Figure 2-7 Southwest and West (right) Views from Scammon Bay (FAA, 2023a)**



Wind data for the previous ALP (2004) was collected at Cape Romanzof LRRS, located 15 miles from Scammon Bay, because no local data was available at the time. Wind data is now available for Scammon Bay through the FAA Airport Data and Information Portal for the period 2013 to 2022 (Table 2-3). Using this data, wind roses were calculated with the following assumptions: Runway True Bearing of 299.5, Crosswind of 13 knots [B-II (S)], Bidirectional Runway. Wind data shows All Weather 90.4% wind coverage for a 13-knot crosswind, and Instrument Weather 87.54% coverage for a 13-knot crosswind (Figure 2-8). As a note, a 13-knot crosswind is referenced because the expected Critical Aircraft is a B-II (S) classification.

Wind analysis revealed that no orientation of a single runway at SCM can meet the 95% crosswind criteria for either a 10.5-knot or a 13-knot crosswind. In situations where a single runway cannot meet 95% coverage, the FAA recommends development of a crosswind runway or, if terrain does not allow, an increase in the runway dimensions to meet the next largest ARC requirements (AC 150/5300-13B, Appendix B Wind Analysis, B.2.3.2).

At SCM, terrain makes creation of a crosswind runway cost prohibitive. Consequently, this report recommends increasing the runway dimensions to the next largest ARC requirements for runway width while maintaining ARC requirements for RSA, ROFZ, and Runway Protection Zone (RPZ).

## 2.3 Facilities

There are no passenger shelter, terminal, or other facilities at SCM. Passengers wait for the aircraft outside, or they listen for the approaching aircraft and then travel to the apron.

There are no cargo facilities at SCM. Cargo is handled by the general public and the pilot of the aircraft.

There are no General Aviation (GA) facilities at SCM.

**Table 2-3 SCM Weather Summaries**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Mean Precip. (inches)** | 0.85 | 0.38 | 0.67 | 0.44 | 1.50 | 1.91 | 4.31 | 5.47[1] | 5.07 | 3.08 | 0.66 | 0.63 |
| **Mean Max Temp (°F)** | 13.8 | 17.6 | 18.3 | 28.51 | 41.5 | 53.2 | 57.1 | 56.2 | 49.5 | 38.1 | 25.6 | 19.9 |
| **Mean Min Temp (°F)** | 3.1 | 6.0 | 6.2 | 18.0 | 31.8 | 43.4 | 48.4 | 47.9 | 42.2 | 31.5 | 17.8 | 10.0 |
| **Mean Avg Temp (°F)** | 8.5 | 11.8 | 12.3 | 23.3 | 36.7 | 48.3 | 52.7 | 52.0 | 45.8 | 34.8 | 21.7 | 14.9 |
| **% of time under Non-VFR conditions[2]** | 28% | 24% | 24% | 28% | 25% | 19% | 21% | 21% | 18% | 16% | 19% | 23% |

Key:

[1] The calculation of this value excluded values from August of 2008 because the station-reported total precipitation for that month was 610.59 inches. Such a quantity is unlikely and its exclusion provides an average that aligns more closely with those of the preceding and subsequent months.

[2] Non-VFR conditions summarized from SCM visibility and ceiling observations at the Airport between 2005 and 2022

°F – degrees Fahrenheit

% – percent

AVG – Average

Max – Maximum

Min – Minimum

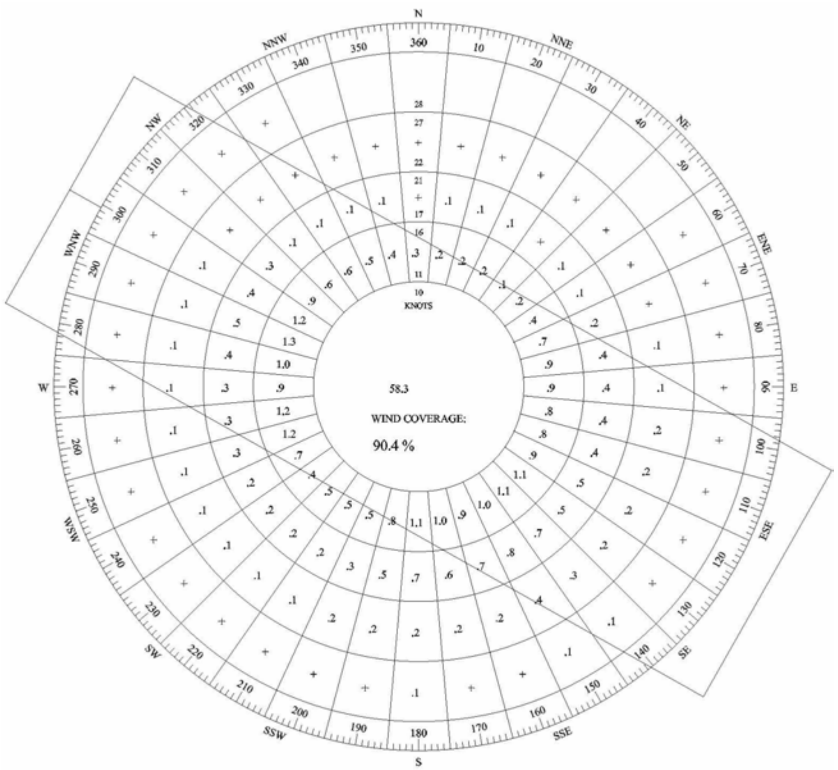
Precip. – Precipitation

Temp – Temperature

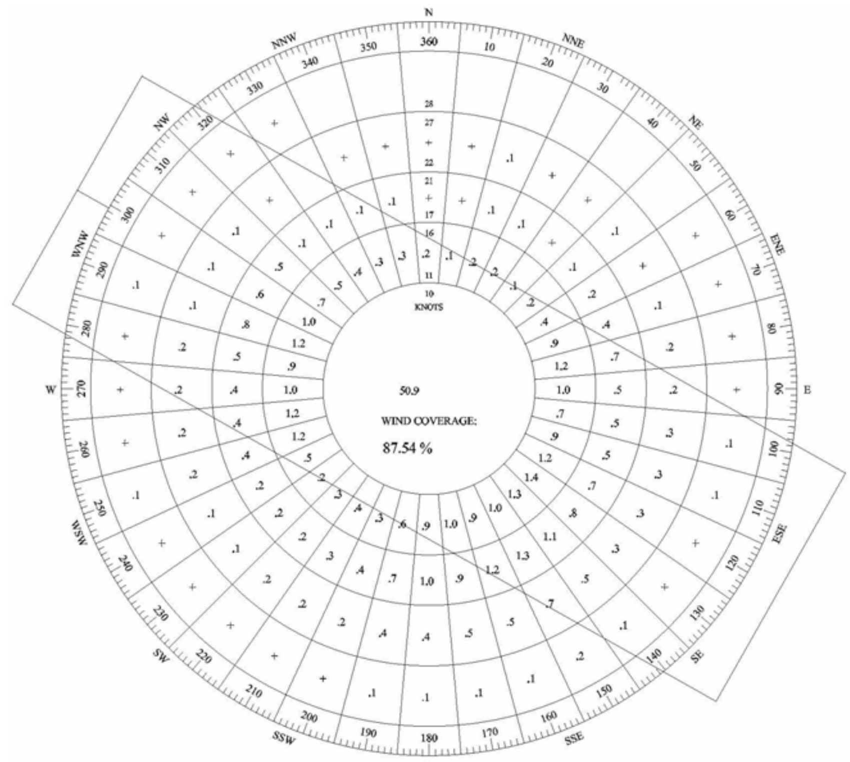
VFR – Visual Flight Rules

Source: ASOS-AWOS-METAR Data Download, https://mesonet.agron.iastate.edu/request/download.phtml?network=AK_ASOS and https://xmacis.rcc-acis.org/.

**Figure 2-8 Wind Rose**




All Weather Conditions, 13 knot crosswind




Instrument Meteorological Conditions, 13 knot crosswind

| Runway 10/28 | | |
|---|---|---|
| Weather | 10.5 knots (A-I & B-I) | 13 knots (A-II & B-II) |
| All Weather | 83.97% | 90.4% |
| Instrument Weather | 80.49% | 87.5% |

(Federal Aviation Administration Recommends 95 percent crosswind component coverage)

### *2.3.1 Fuel Storage*

Aviation fuel is not available for purchase at SCM.

Fuel storage on the Airport is limited to a 1,000-gallon heating oil tank and a 1,000-gallon diesel fuel tank at the SREBs.

The community receives fuel deliveries by barge from the city dock, which is on Airport property and adjacent to the threshold of Runway 10. Fuel is transferred through a pipeline, along the access road on Airport property, to a tank farm off Airport property. The community would like to improve the city dock but has difficulty receiving funding due to its location on Airport property. The community would prefer to maintain the existing dock, rather than build a new one. If the Airport is relocated, the community would be interested in acquiring the property.

### *2.3.2 Chemical Materials*

No chemicals, other than standard vehicle maintenance lubricants, are stored at the Airport.

## 2.4 Maintenance and Operations

Airport maintenance facilities include two SREBs.

## 2.5 Access, Circulation, and Parking

The apron is accessed by the community Airport access road. Airport access roads serving only the airport are typically eligible for AIP funding. The Airport access road has an encroaching basketball court. This basketball court may impact the length of airport access road eligible for AIP funding.

The community has a city dock, haul road to the dock, and freight storage on Airport property. These developments are not typically eligible for AIP funding. Funding to maintain or improve these facilities is difficult to obtain because they are on Airport property. If the Airport is shifted or relocated, the community would be interested in purchasing the property.

There is no formal parking at the Airport. Users access the apron directly.

The Airport is not fenced.

## 2.6 Utilities

The Airport is connected to the city's power grid, which provides the electricity for the Airport. Telecommunications is also provided to the Airport.

No other utilities are present on the Airport.

## 2.7 Land Use

Land use plans indicate there are no leases at the Airport (Figures 2-9 and 2-10). The FAA does have a weather station and support facilities on the apron, and there is a utility pole on the apron.

The sewage lagoon is located off Airport property, approximately 540 feet south of the center the runway.

The solid waste facility is located off Airport property, approximately 3,500 feet southeast of the runway end.

The city dock, haul road, and freight storage are on Airport property, adjacent to the runway threshold. Boats are stored on the shoreline surrounding the runway.

The community is located directly adjacent to the Airport. In rural Alaska, communities are often located close to the airport. Community stakeholders tend to view airplane noise as a welcome reminder of connections to regional infrastructure, rather than as an inconvenience.

There is no borough or city zoning in the area.

### *2.7.1 Property*

The ALP published a Property Plan (Figure 2-9), and DOT&PF maintains a Land Occupancy Plan (Figures 2-10 and 2-11). The Property Plan indicates that the runway and Airport access road are owned by the State of Alaska.

The approach to RW10 has an aviation and hazard easement from the State of Alaska Department of Natural Resources to DOT&PF.

A portion of the land off the end of RW28 needs to be acquired from the Calista Corporation and the Askinuk Corporation.

**Figure 2-9 Property Plan**

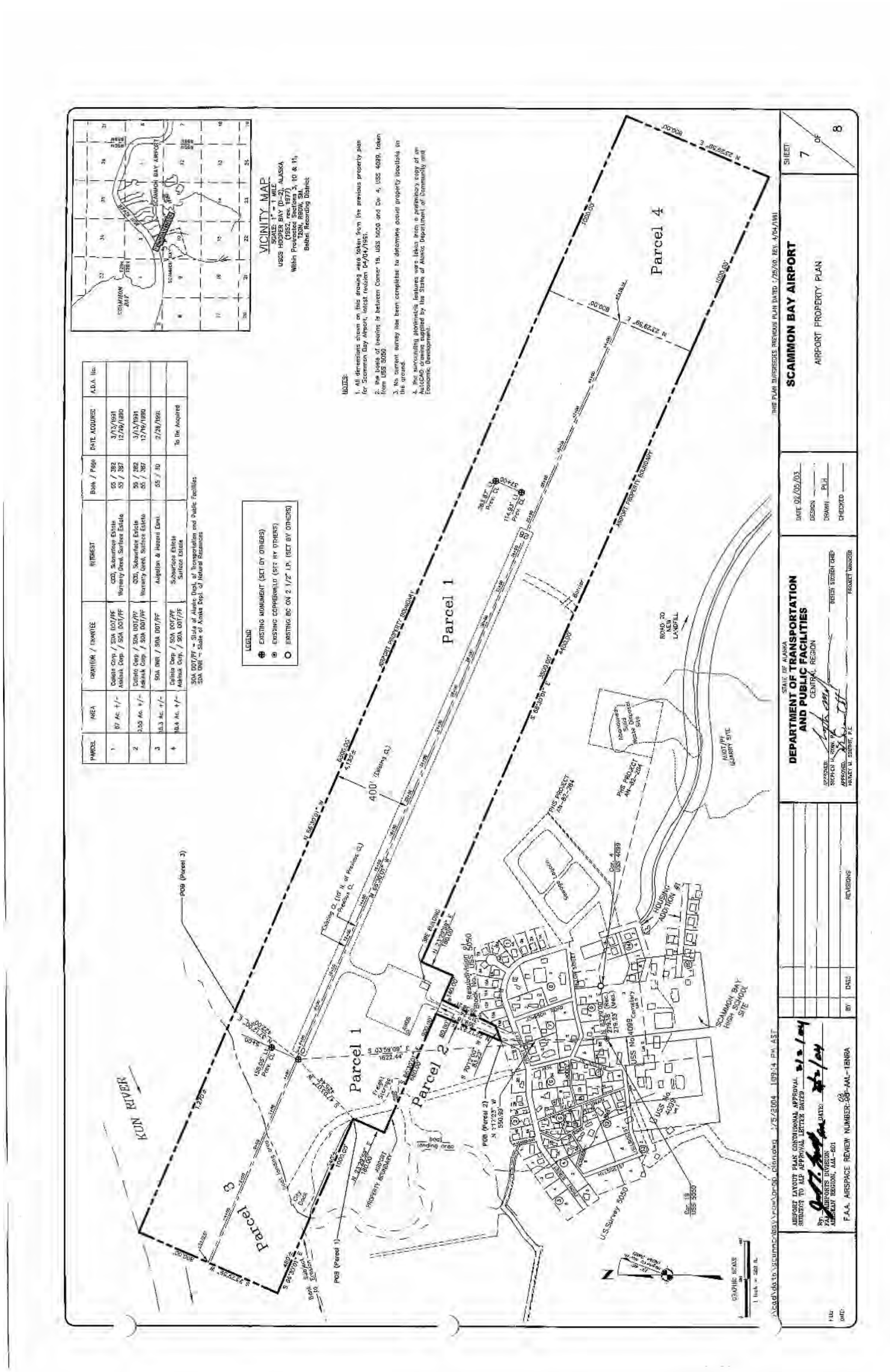


**Figure 2-10 Land Occupancy Plan Sheet 1**

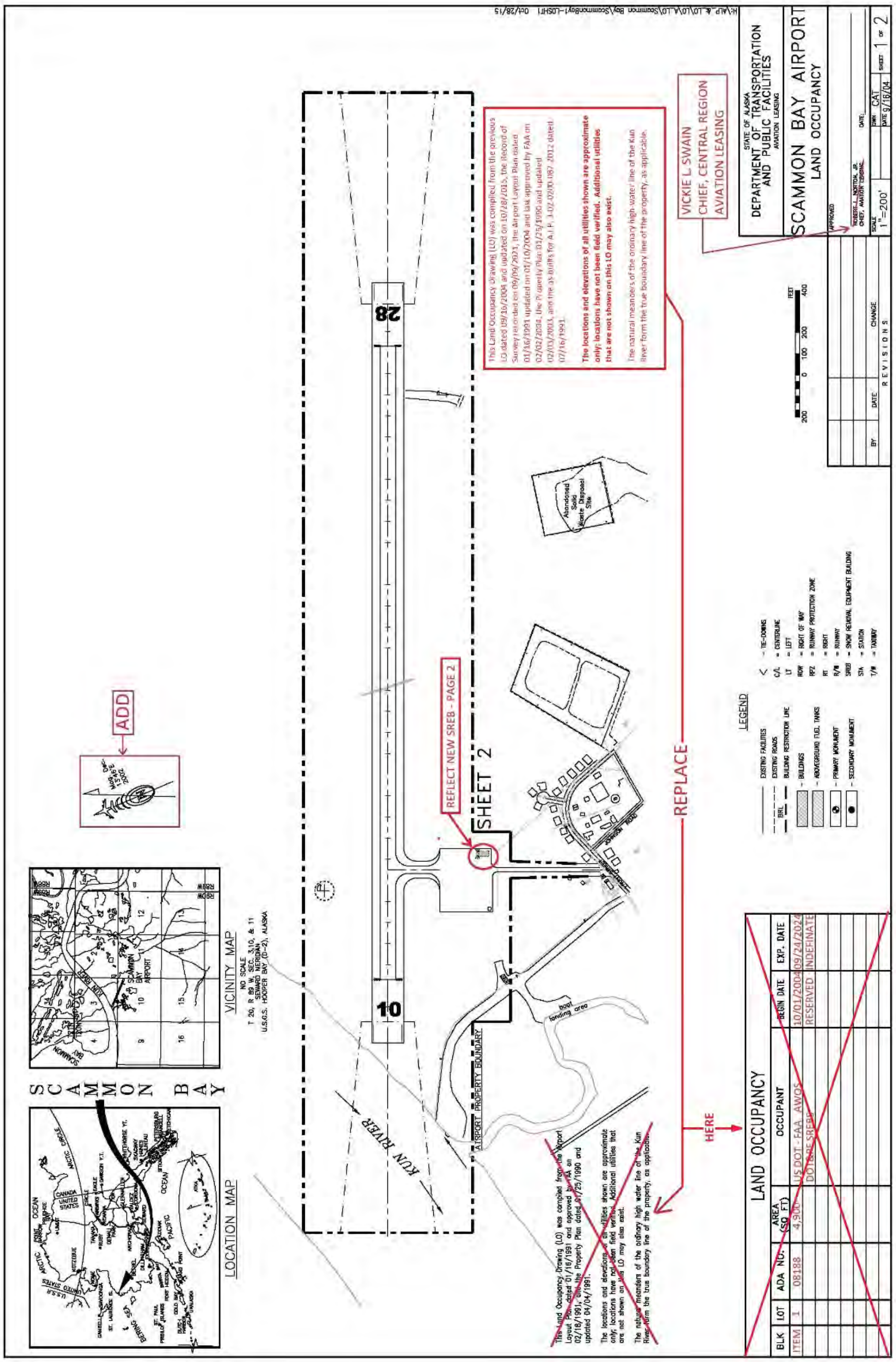
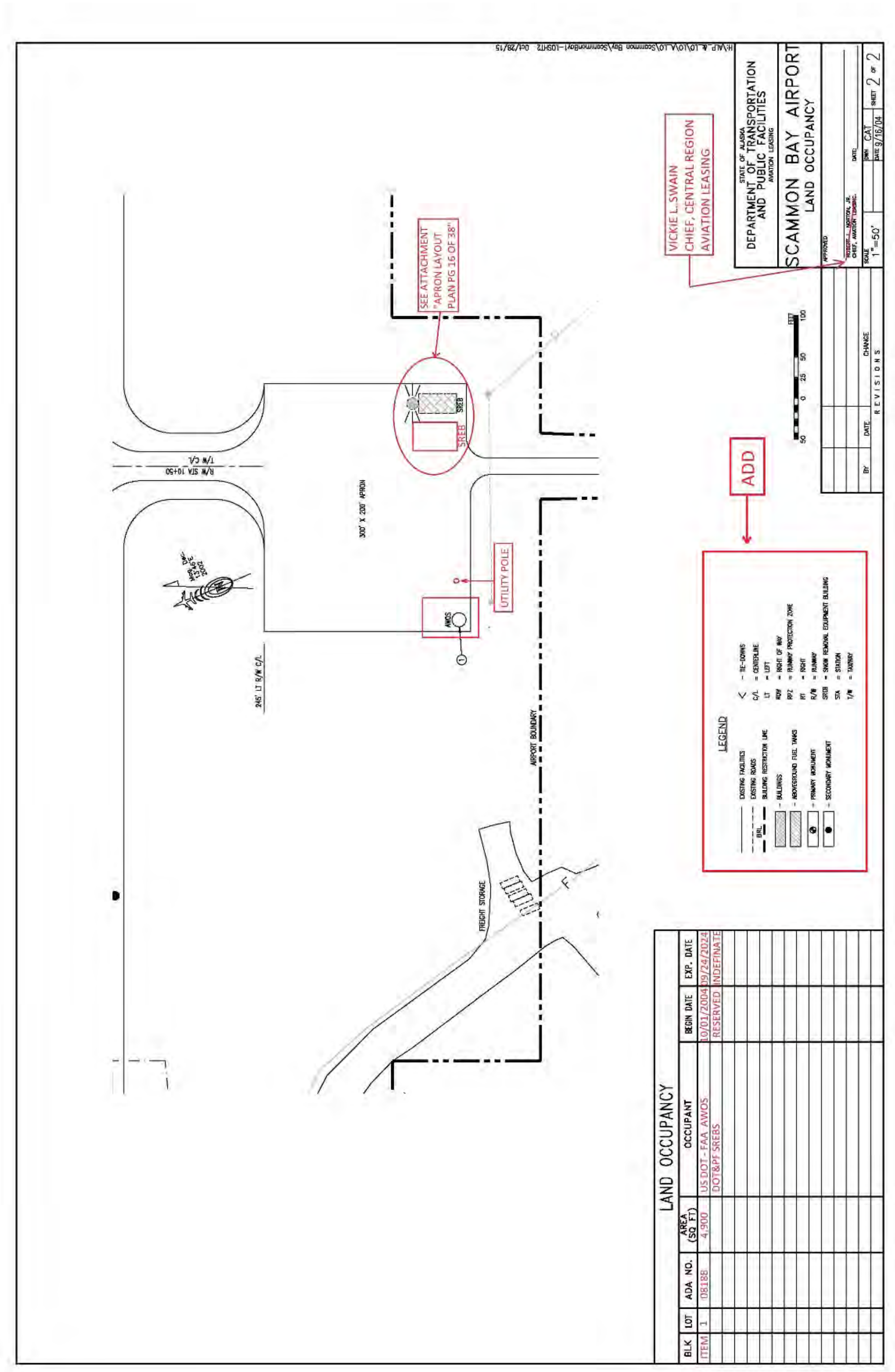


**Figure 2-11 Land Occupancy Plan Sheet 2**



# 3 FORECAST AND AVIATION ACTIVITY

## 3.1 Commercial Activity

Commercial flights are the primary activity at Scammon Bay, there is no significant military or general aviation use of the Airport.

Commercial activity operates on a hub and spoke system, from the primary hub of Bethel. Two air carriers, Grant Aviation and Ryan Air, provide most of the service (Tables 3-1 and 3-2). Grant Aviation schedules flights four times per day (only two times per day on Sundays), and Ryan Air schedules flights once per day. In early 2020, Hageland Aviation (Ravn Alaska) ended service to the community, as the parent company went bankrupt.

There is a variance between different datasets for flights completed. The air carrier-reported data for 2022 indicate that Grant Aviation and Ryan Air completed 89% and 70% of their scheduled flights, respectively (USBTS, 2023). Flight radar tracking data indicate that only 19% of scheduled flights to Scammon Bay were completed between October 7 and December 7, 2023 (FlightRadar24.com). This disparity may come from different data collection methods (U.S. Bureau of Transportation Statistics [USBTS] data is air carrier self-reported, Flight Radar data is from third party air traffic monitoring) but illustrates an uncertainty about level of service.

Scammon Bay is not connected to any other community by road. Aviation provides the only year-round connection to other communities and regional infrastructure, such as medical care, groceries, and retail. While seasonal boating, barge, and overland travel do provide connections to other communities in the winter and summer; in the spring and fall, the Airport remains the only lifeline to other communities and to medical care.

The number of passengers enplaned at Scammon Bay is shown in Table 3-3 and illustrated on Figure 3-1. A decrease in aviation activity occurred because of COVID-19 pandemic restrictions in 2020 and 2021. Aviation activity began to pick back up in 2022.

**Table 3-1 Operations of Major Air Carriers Providing Service to Scammon Bay, 2013- 2022**

| Air Carrier | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Grant Aviation** | 1,704 | 1,628 | 1,727 | 1,690 | 1,414 | 1,590 | 1,925 | 1,685 | 2,040 | 2,413 |
| **Ryan Air (also Arctic Transportation)** | 208 | 220 | 242 | 214 | 280 | 282 | 266 | 285 | 346 | 514 |
| **Yute (Air and Commuter Service)** | 48 | 16 | 20 | 18 | 18 | 22 | 4 | 6 | 63 | 152 |
| **Bering Air Inc.** | 4 | 10 | - | - | 8 | 10 | 8 | 38 | 40 | 148 |
| **Fox Aircraft** | - | - | - | - | - | - | - | - | - | 118 |
| **Iliamna Air Taxi** | - | - | - | - | - | - | - | 12 | 10 | 4 |
| **Katmai Air** | - | - | - | - | - | - | - | - | 2 | 1 |
| **Alaska Central Express** | 4 | - | - | - | - | - | - | - | - | - |
| **Ravn Alaska (also Northern Pacific Airways)** | - | - | - | 2 | 6 | - | 2 | - | - | - |
| **Frontier Flying Service** | - | - | - | - | 6 | 2 | - | - | - | - |
| **Hageland Aviation Service** | 2,245 | 2,639 | 2,441 | 2,576 | 1,974 | 1,847 | 1,646 | 254 | - | - |
| **Everts Air Alaska and Everts Air Cargo** | - | - | 2 | - | - | - | - | - | - | - |
| **Total** | 4,213 | 4,513 | 4,432 | 4,500 | 3,706 | 3,753 | 3,851 | 2,280 | 2,501 | 3,350 |

Source: USBTS, 2023.

**Table 3-2 Aircraft Used by Major Air Carriers in 2022**

| Air Carrier | Aircraft | Operations |
|---|---|---|
| **Grant Aviation** | Gipps Aero Ga8 Airvan | 52 |
| | Cessna C206/207/209/210 Stationair | 70 |
| | Cessna 208 Caravan | 832 |
| **Ryan Air** | Cessna C206/207/209/210 Stationair | 70 |
| | Casa/Nurtanio C212 Aviocar | 824 |
| | Cessna 208 Caravan | 832 |
| | Pilatus PC-12 | 958 |

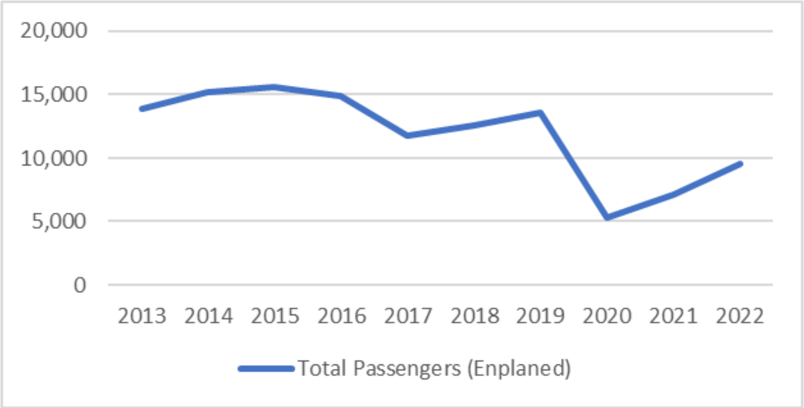
Source: USBTS, 2023.

**Table 3-3 Passengers, Freight, and Mail at Scammon Bay, 2013- 2022**

| Year | Passengers (Leaving) | Passengers (Incoming) | Total Passengers (Enplaned) | Freight (Leaving) | Freight (Incoming) | Freight (Total) | Mail (Leaving) | Mail (Incoming) | Mail (Total) |
|---|---|---|---|---|---|---|---|---|---|
| **2013** | 6,395 | 7,510 | 13,905 | 77,282 | 245,092 | 322,374 | 222,075 | 1,054,810 | 1,276,885 |
| **2014** | 7,474 | 7,672 | 15,146 | 68,486 | 243,696 | 312,182 | 307,253 | 1,293,912 | 1,601,165 |
| **2015** | 7,826 | 7,814 | 15,640 | 55,755 | 215,921 | 271,676 | 255,669 | 1,164,383 | 1,420,052 |
| **2016** | 7,483 | 7,389 | 14,872 | 48,820 | 181,657 | 230,477 | 259,721 | 1,146,167 | 1,405,888 |
| **2017** | 5,886 | 5,845 | 11,731 | 43,649 | 197,827 | 241,476 | 168,818 | 1,128,822 | 1,297,640 |
| **2018** | 6,276 | 6,246 | 12,522 | 37,980 | 229,943 | 267,923 | 141,259 | 1,036,875 | 1,178,134 |
| **2019** | 6,793 | 6,741 | 13,534 | 28,621 | 194,012 | 222,633 | 170,301 | 1,043,342 | 1,213,643 |
| **2020** | 2,646 | 2,697 | 5,343 | 27,449 | 239,545 | 266,994 | 121,181 | 1,113,329 | 1,234,510 |
| **2021** | 3,576 | 3,564 | 7,140 | 29,368 | 235,120 | 264,488 | 73,949 | 1,152,124 | 1,226,073 |
| **2022** | 4,773 | 4,791 | 9,564 | 24,476 | 501,149 | 525,625 | 64,913 | 1,346,783 | 1,411,696 |

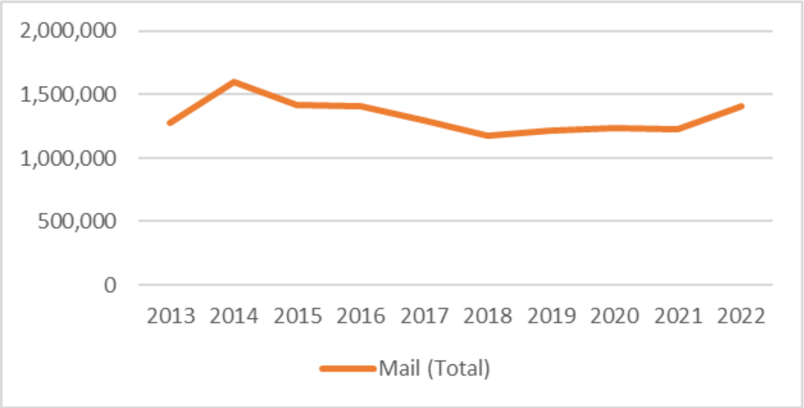
Source: USBTS, 2023.

**Figure 3-1 Enplaned Passengers at Scammon Bay, 2013- 2022**



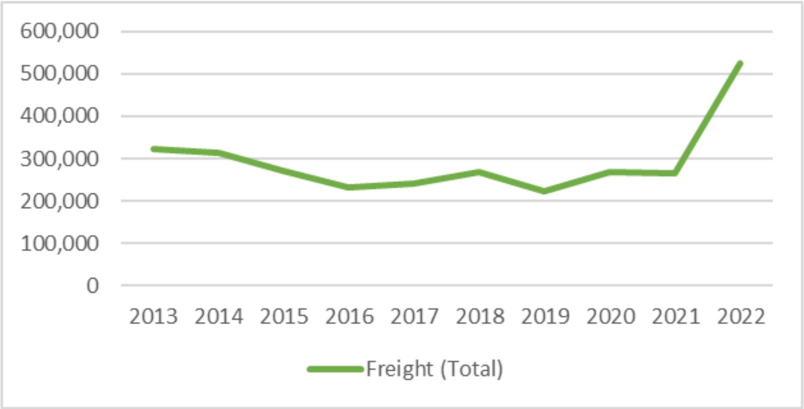

Source: USBTS, 2023.

**Figure 3-3 Total Mail (pounds) at Scammon Bay, 2013- 2022**




Source: USBTS, 2023.

**Figure 3-2 Total Freight (pounds) at Scammon Bay, 2013- 2022**




Source: USBTS, 2023.

To emphasize the importance of the Airport, it is important to note that the residents of Scammon Bay have a significantly larger number of per capita enplanements than the nation as a whole. With 9,564 enplanements in 2022 (Table 3-3), the per capita enplanements for Scammon Bay is approximately 17. For comparison, in 2022 for the United States as a whole, there were 853 million enplanements for 338 million people – an average of 2.5 enplanements per capita. Scammon Bay residents have approximately six times more enplanements per capita than the United States average.

Beyond enplanements, Table 3-3 and Figures 3-2 and 3-3 also demonstrate the importance of freight and mail service at the Airport. In 2022, the mail and air freight transported approximately 3,400 pounds of freight per capita at Scammon Bay. The vast majority of this freight is goods being transported into Scammon Bay. These goods represent a significant source of supplies for local residents, including groceries, consumer goods, and other essentials. The seasonal barge is the only other major source of freight into the community, and the barge is reserved for large, non-perishable items such as vehicles and building supplies.

Figures 3-2 and 3-3 show the past mail and freight activity at SCM. Mail activity remained constant throughout the COVID-19 downturn with regard to enplanements, demonstrating the continued importance of the mail system in supplying Scammon Bay.

It is relevant to note that the freight increased dramatically in 2022, roughly doubling to 525,625 pounds in 2022 from 264,488 pounds in 2021. Freight numbers are only released for the first 6 months of 2023, but the trend appears to have returned to pre-2022 levels, with approximately 170,000 pounds shipped between January and June 2023 (Table 3-4).

To investigate the freight shipments in 2022, Table 3-4 breaks down the monthly freight shipped at SCM between 2013 and 2023. The average per month volume typically varies between 15,000 and 20,000 pounds. March, April, and May of 2022 are exceptional for the high volume of shipments (italicized and underlined in Table 3-4) of between 76,603 pounds and 87,394 pounds. April of 2023 also saw higher than normal levels of freight (46,373 pounds). Interviews with air carriers indicated that these were temporary increases, related to the import of fuel and construction of a church.

**Table 3-4 Monthly Freight Transportation (pounds) at Scammon Bay, 2013- 2023**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total | Mean per Month |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2013** | 9,422 | 16,104 | 10,331 | 22,713 | 40,957 | 26,485 | 32,861 | 30,829 | 16,073 | 17,733 | 12,842 | 8,742 | 245,092 | 20,424 |
| **2014** | 9,473 | 12,839 | 14,827 | 11,676 | 26,789 | 19,548 | 21,181 | 20,682 | 19,093 | 54,477 | 19,924 | 13,187 | 243,696 | 20,308 |
| **2015** | 9,284 | 10,201 | 11,576 | 16,324 | 16,338 | 26,367 | 19,340 | 13,887 | 19,603 | 26,553 | 34,058 | 12,390 | 215,921 | 17,993 |
| **2016** | 12,720 | 9,771 | 15,168 | 19,367 | 15,398 | 14,510 | 16,285 | 14,359 | 15,347 | 11,874 | 13,302 | 23,556 | 181,657 | 15,138 |
| **2017** | 13,580 | 7,509 | 14,920 | 14,869 | 18,191 | 15,411 | 20,733 | 23,089 | 19,689 | 22,642 | 12,715 | 14,479 | 197,827 | 16,486 |
| **2018** | 10,014 | 3,926 | 11,554 | 9,758 | 18,633 | 26,325 | 23,004 | 21,868 | 24,530 | 25,792 | 25,190 | 29,349 | 229,943 | 19,162 |
| **2019** | 11,664 | 7,977 | 16,620 | 19,765 | 19,472 | 16,959 | 19,485 | 15,586 | 18,194 | 18,278 | 15,792 | 14,220 | 194,012 | 16,168 |
| **2020** | 15,560 | 10,654 | 12,295 | 16,327 | 20,221 | 19,488 | 27,035 | 32,409 | 31,471 | 23,581 | 13,196 | 17,308 | 239,545 | 19,962 |
| **2021** | 23,279 | 31,332 | 12,349 | 23,174 | 19,832 | 16,429 | 18,235 | 18,530 | 14,088 | 23,363 | 22,289 | 12,220 | 235,120 | 19,593 |
| **2022** | 23,889 | 29,904 | ***<u>87,394</u>*** | ***<u>76,603</u>*** | ***<u>82,172</u>*** | 28,630 | 15,603 | 25,729 | 32,349 | 46,112 | 26,403 | 26,361 | 501,149 | 41,762 |
| **2023** | 27,919 | 14,095 | 25,567 | ***<u>46,373</u>*** | 26,858 | | | | | | | | 140,812 | 28,162 |
| **Mean Per Month** | 15,164 | 14,028 | 21,146 | 25,177 | 27,715 | 21,015 | 21,376 | 21,697 | 21,044 | 27,041 | 19,571 | 17,181 | 15,164 | |

***<u>Bold, italics, underline</u>*** – high volume shipments

Source: USBTS, 2023.

### 3.2 Airport Operations

Airport operations are dominated by the regular commercial air-taxi service provided by Grant Aviation and Ryan Air (Tables 3-1 and 3-2). Grant Aviation flies the Cessna C208 Caravan, Cessna 207 Stationair, and Gipps Aero Ga8 Airvan. Ryan Air flies the Cessna 208 Caravan, Casa C212, Cessna 207 Stationair, and the Pilatus PC-12. Aircraft have different operations envelopes, with utility operations allowing limited acrobatic operations, and normal operations excluding these types of maneuvers.

The bulk of the operations are completed by the Cessna 208 Caravan, which is an Aircraft Approach Category (AAC) A and Airplane Design Group (ADG) II (S) aircraft (Tables 3-5, 3-6, and 3-7). The AAC/ADG categorizes aircraft by aircraft design requirements, specifically approach speed and wingspan. The second most common aircraft is the Casa C212, which is an A-II aircraft, but logged only 340 annual operations at SCM.

Preliminary data indicates an increasing usage in 2023 of the Piper PA-31 (Navajo) (B-I) by Fox Aircraft (Table 3-5). As of September 2023, preliminary data indicate 240 year-to-date operations at Scammon Bay. This is an increase from previous years, and if the trend continues for the final quarter of 2023, would indicate ~320 operations in 2023 (Table 3-5). Due to this increasing use, the planning team interviewed Fox Aircraft about their operations. In 2022 and 2023, Fox Aircraft has been using a Navajo to offer chartered air service and has seen expanding operations at SCM. They anticipate offering regularly scheduled air service in 2024 and beyond, starting at 3 to 4 times per week, 1 to 2 trips per day. While the Navajo has historically not crossed the 500-operation threshold, this indicates that it may in 2024. As a result, it is included in the consideration of the critical aircraft.

The Casa C212 and Gipps Airvan are important to note as the primary heavy cargo haulers using SCM. They can both takeoff in excess of 10,000 pounds, and maintain the slow airspeeds required to operate on A-I/II airports. These provide important cargo haul capability to Scammon Bay and supplement the seasonal barge service.

There are no general aviation aircraft based at Scammon Bay. No general aviation aircraft are registered in the FAA Aircraft Owners Database, and none are reported on the 5010 database.

### Table 3-5 Aircraft Operations at Scammon Bay, 2013- 2022

| Year | AAC | ADG | TDG | Small? | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cessna 208 Caravan** | A | II | 1A | S | 3,039 | 3,193 | 3,444 | 3,748 | 3,092 | 3,239 | 3,442 | 1,961 | 2,168 | 2,539 |
| **Casa/Nurtanio C212 Aviocar** | A | II | 1A | | 200 | 208 | 170 | 152 | 194 | 188 | 166 | 159 | 162 | 340 |
| **Cessna C206/207/209/210 Stationair** | A | I | 1A | S | 495 | 586 | 363 | 368 | 296 | 246 | 180 | 40 | 71 | 173 |
| **Cessna C208B/Grand Caravan** | A | II | 1A | S | 0 | 0 | 0 | 0 | 6 | 4 | 4 | 8 | 26 | 124 |
| **Piper PA-31 (Navajo)/T-1020** | B | I | 1A | S | 189 | 162 | 158 | 24 | 14 | 8 | 36 | 40 | 2 | 102 |
| **Gipps Aero Ga8 Airvan** | A | I | | | 0 | 0 | 34 | 14 | 84 | 54 | 17 | 28 | 34 | 26 |
| **Beech 200 Super Kingair** | B | II | 2 | | 28 | 6 | 0 | 0 | 2 | 4 | 0 | 26 | 12 | 22 |
| **Piper PA-32 (Cherokee 6)** | A | I | 1A | S | 0 | 0 | 0 | 0 | 0 | 4 | 4 | 4 | 10 | 13 |
| **Pilatus PC-12** | A | II | 2 | S | 2 | 0 | 4 | 2 | 2 | 0 | 0 | 12 | 16 | 9 |
| **Cessna 172 Skyhawk** | A | I | 1A | S | 0 | 0 | 0 | 6 | 4 | 4 | 0 | 0 | 0 | 2 |
| **Beech 1900 A/B/C/D** | B | II | 2 | | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 |
| **Cessna 406 Caravan II** | | | | | 256 | 358 | 259 | 184 | 0 | 0 | 0 | 0 | 0 | 0 |
| **De Havilland DHC8-100 Dash-8** | B | III | 3 | | 0 | 0 | 0 | 2 | 6 | 0 | 2 | 0 | 0 | 0 |

Key: AAC – Aircraft Approach Category; ADG – Airplane Design Group; TDG – Taxiway Design Group

Source: USBTS, 2023

### Table 3-6 Aircraft Approach Category (AAC) and Airplane Design Group (ADG)

| AAC | Approach Speed (knots) | ADG | Wingspan (feet) | Tail Height (feet) |
|---|---|---|---|---|
| **A** | less than 91 | I | To 48 | To 20 |
| **B** | 91-120 | II | 49-78 | 20-30 |
| **C** | 121-140 | III | 79-117 | 30-45 |
| **D** | 141-165 | IV | 118-170 | 45-60 |
| **E** | 166 or more | V | 171-213 | 60-66 |
| | | VI | 214-262 | 66-80 |

Source: AC 150/5300-13A, Airport Design

**Table 3-7 Aircraft Design Requirements at Scammon Bay**

| Aircraft | AAC | ADG | TDG | Wingspan | Length | Cockpit to Main Gear | Main Gear Width (MGW) | MTOW |
|---|---|---|---|---|---|---|---|---|
| **Cessna 208 Caravan** | A | II | 1A | 52.1 | 37.6 | 7.7 | 11.7 | 9062 |
| **Casa/Nurtanio C212 Aviocar** | A | II | 1A | 62.3 | 53 | 18.1 | 11.2 | 16976 |
| **Cessna C206/207/209/210 Stationair** | A | I | 1A | 36-36.8 | 28.3-31.5 | 1.8-6 | 8.1-10.3 | 3600-3800 |
| **Cessna C208B/Grand Caravan** | A | II | 1A | 52.1 | 37.6 | 7.7 | 11.7 | 9062 |
| **Piper PA-31 (Navajo)/T-1020** | B | I | 1A | 40.7 | 32.6 | 10.7 | 13.8 | 6500 |
| **Gipps Aero Ga8 Airvan** | A | I | | | | | | |
| **Beech 200 Super Kingair** | B | II | 2 | 54.5 | 43.8 | 15 | 17.2 | 12500 |
| **Piper PA-32 (Cherokee 6)** | A | I | 1A | 36.2 | 27.6 | 7.2 | 11.1 | 3600 |
| **Pilatus PC-12** | A | II | 2 | 53.3 | 47.3 | 11.4 | 14.8 | 10450 |

Key: AAC: Aircraft Approach Category; ADG: Airplane Design Group; TDG: Taxiway Design Group; MTOW: Maximum Takeoff Weight (pounds)

Source: USBTS, 2023.

There are also no known military aircraft operations at Scammon Bay. The Cape Romanzof LRRS Airport is located 15 miles from SCM, and SCM could be used as a weather refuge, if required.

### *3.2.1 Airport Operations Forecast*

FAA forecasting guidance recommends using demographic, economic, geographic, and aviation trends to forecast airport activity. Scammon Bay is primarily a residential community, with limited economic activity. The factors influencing aviation activity are related to changes in the residential population at Scammon Bay. Geography plays an important factor, because aviation service is provided on flights from Bethel, which serve multiple regional communities on the same trip. There are no known military or general aviation activities. The population trends for Scammon Bay, and the region, are the best indicator of airport operations.

The Alaska Department of Labor and Workforce Development provides historic population counts for the Bethel Census Area, Kusilvak Census Area (which includes Scammon Bay), and Scammon Bay itself (Table 3-8 and Figure 3-4). The department also provides projections of future population for the Bethel Census Area and Kusilvak Census Area (Table 3-8). Since a future projection is not available for Scammon Bay, the percentage of population change projected for the Kusilvak Census Area was extrapolated to Scammon Bay, to provide an estimate for the local future population (Table 3-8).

Since 2011, the population at Scammon Bay has increased from 503 to 615 (Table 3-8). This represents a population fluctuation of 22%. Overall, the State of Alaska anticipates that the population is expected to moderately increase, from the current population of 615 individuals to 775 in 2045.

To account for the inherent uncertainty in population projections, Table 3-9 provides High, Medium, and Low growth forecasts. The Medium forecast was set equal to the State’s projected population change for the Kusilvak Census Area (Table 3-8). The High and Low forecasts were set for +/- 2% of the Medium growth rates, respectively (Table 3-9). This results in a range of population forecasts for Scammon Bay (Figure 3-4, Table 3-9).

### Table 3-8 Population Estimates: Historic (2011 – 2022) and Estimated (2025 – 2045)

| | Bethel Census Area | (% Growth) | Kusilvak Census Area | (% Growth) | Scammon Bay | (% Growth) |
|---|---|---|---|---|---|---|
| **2011** | 17,539 | | 7,710 | | 503 | |
| **2012** | 17,717 | 1.0% | 7,738 | 0.4% | 537 | 6.8% |
| **2013** | 18,140 | 2.4% | 8,046 | 4.0% | 522 | -2.8% |
| **2014** | 18,407 | 1.5% | 8,212 | 2.1% | 535 | 2.5% |
| **2015** | 18,582 | 1.0% | 8,361 | 1.8% | 569 | 6.4% |
| **2016** | 18,595 | 0.1% | 8,397 | 0.4% | 579 | 1.8% |
| **2017** | 18,717 | 0.7% | 8,448 | 0.6% | 582 | 0.5% |
| **2018** | 18,685 | -0.2% | 8,571 | 1.5% | 605 | 4.0% |
| **2019** | 18,874 | 1.0% | 8,477 | -1.1% | 601 | -0.7% |
| **2020** | 18,666 | -1.1% | 8,368 | -1.3% | 600 | -0.2% |
| **2021** | 18,485 | -1.0% | 8,163 | -2.4% | 579 | -3.5% |
| **2022** | 18,207 | -1.5% | 8,158 | -0.1% | 615 | 6.2% |
| **2025** | 18,349 | 0.8% | 8,620 | 5.7% | 649 | 5.7% |
| **2030** | 18,902 | 3.0% | 9,024 | 4.7% | 680 | 4.7% |
| **2035** | 19,476 | 3.0% | 9,409 | 4.3% | 709 | 4.3% |
| **2040** | 20,070 | 3.0% | 9,808 | 4.2% | 739 | 4.2% |
| **2045** | 20,737 | 3.3% | 10,282 | 4.8% | 775 | 4.8% |

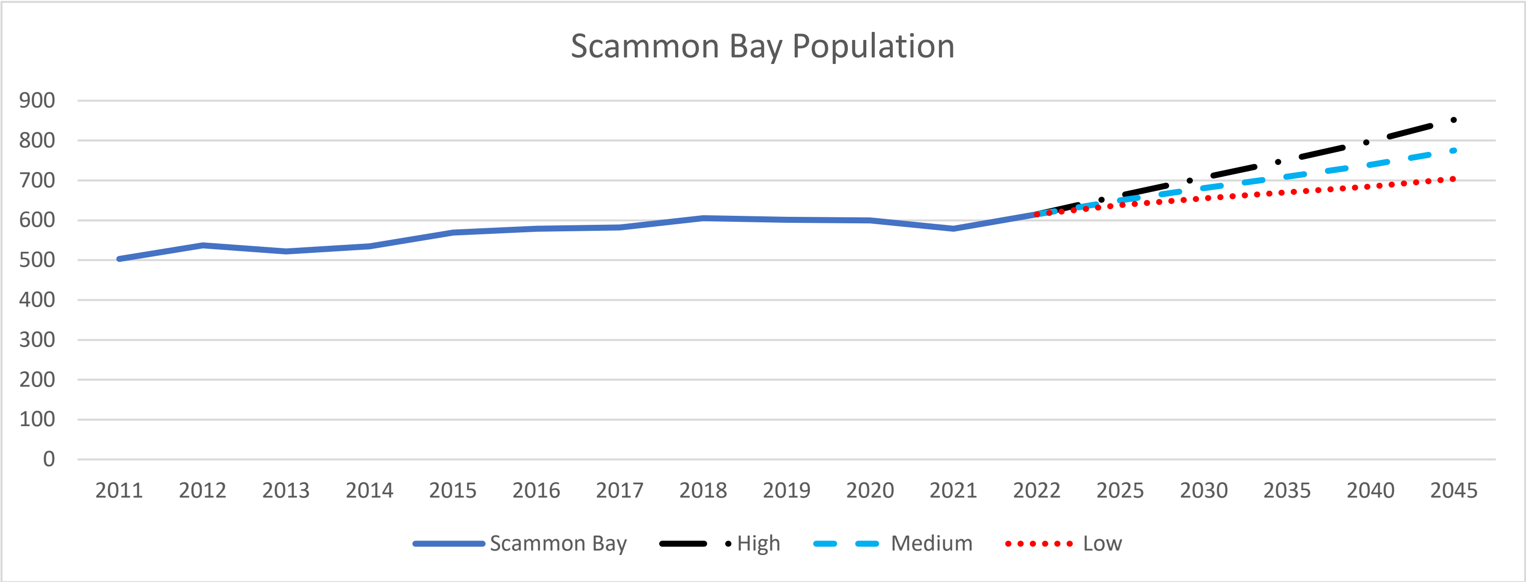
Key: % – percent Source: ADLWD, 2023

### Table 3-9 Scammon Bay Population Estimates: High, Medium, Low

| | High | (% Growth) | Medium | (% Growth) | Low | (% Growth) |
|---|---|---|---|---|---|---|
| **2025** | 615 | | 615 | | 615 | |
| **2030** | 638 | 3.70% | 650 | 5.70% | 662 | 7.70% |
| **2035** | 655 | 2.70% | 681 | 4.70% | 707 | 6.70% |
| **2040** | 670 | 2.30% | 710 | 4.30% | 751 | 6.30% |
| **2045** | 685 | 2.20% | 740 | 4.20% | 798 | 6.20% |

Key: % – percent Source: ADLWD, 2023

**Figure 3-4 Scammon Bay Population: Historic (2011 – 2021) and Estimated (2025 – 2045)**



Reported aircraft operations have remained remarkably constant since 2013 (Table 3-10). While these activity levels are derived from regular reports from air carriers and may be subject to data gaps from unreported data, the general trends demonstrate that enplanements dipped due to COVID-19 in 2020 and 2021. Disregarding the COVID-19 dip, operations have typically remained between 3,426 and 4,936 per year. This trend is in spite of total enplanements decreasing from 13,905 in 2013 to 9,564 in 2022 (Table 3-10). The steady activity may be the result of daily flights being less full and the ‘milk run’ structure of air service. The ‘milk run’ structure is where air charters serve many communities on the same flight from Bethel, thus compensating for the low demand to any single community.

#### *3.2.1.1 Population Based Forecast*

The population-based forecast was used to correlate percentage changes in population with aviation activity (i.e., operations and enplanements).

To estimate operations and enplanements, the High/Medium/Low growth estimates (Table 3-9) were applied to the historical data. Table 3-10 presents the forecasted operations and enplanements, with a medium forecast of between 3,620 and 4,318 operations from 2025 to 2045. Since military and general aviation aircraft do not appear to have a history of operations at the Airport, no military or general aviation activity is included in the forecast. These forecasts represent a return of activity to pre-COVID levels, while also reflecting the slowly growing population

Table 3-11 presents forecasted mail and freight, with a medium forecast of mail between 1,491,698 and 1,794,133 pounds from 2025 to 2045. For mail, this continues to represent a growth of mail that corresponds to the population growth for the community. For freight, there is a significant disparity between the 2022 tonnage and previous years. Regardless of which numbers (2022 or pre-2022) are used for a baseline, the differences are not large enough to require a difference in design requirements for the Airport. As a result, the 2022 freight numbers were used for consistency.

Table 3-12 presents forecasted aircraft operations, calculated from the expected medium population growth rates, applied to the 2022 aircraft operations numbers. These indicate that the Cessna 208 Caravan is expected to remain the dominant aircraft. The Piper PA-31 (Navajo) aircraft estimates were adjusted, to take into account the air carrier interview, which anticipates passenger service taking place three times a week, two times a day.

**Table 3-10 Scammon Bay Operations and Enplanements: Historic and Forecast**

| | Operations | | | | | | Enplanements | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Historic | Forecast | | | | % Change | Historic | Forecast | | | | % Change |
| | | Low | Medium | High | TAF | | | Low | Medium | High | TAF | |
| **2013** | 3,953 | | | | | | 13,905 | | | | | |
| **2014** | 4,331 | | | | | 110% | 15,146 | | | | | 109% |
| **2015** | 4,936 | | | | | 114% | 15,640 | | | | | 103% |
| **2016** | 4,652 | | | | | 94% | 14,872 | | | | | 95% |
| **2017** | 4,453 | | | | | 96% | 11,731 | | | | | 79% |
| **2018** | 4,394 | | | | | 99% | 12,522 | | | | | 107% |
| **2019** | 4,798 | | | | | 109% | 13,534 | | | | | 108% |
| **2020** | 2,591 | | | | | 54% | 5,343 | | | | | 39% |
| **2021** | 1,889 | | | | | 73% | 7,140 | | | | | 134% |
| **2022** | 3,426 | | | | | 181% | 9,564 | | | | | 134% |
| **2025** | | 3,551 | 3,620 | 3,689 | 500 | 106% | | 9,915 | 10,106 | 10,297 | 3,426 | 106% |
| **2030** | | 3,647 | 3,790 | 3,936 | 500 | 105% | | 10,180 | 10,579 | 10,985 | 3,426 | 105% |
| **2035** | | 3,729 | 3,951 | 4,181 | 500 | 104% | | 10,412 | 11,031 | 11,674 | 3,426 | 104% |
| **2040** | | 3,813 | 4,119 | 4,443 | 500 | 104% | | 10,644 | 11,498 | 12,402 | 3,426 | 104% |
| **2045** | | 3,921 | 4,318 | 4,746 | 500 | 105% | | 10,946 | 12,054 | 13,250 | 3,426 | 105% |

Key:

% – percent

% Change is from the Medium Forecast

% Difference between TAF and Population based forecasts are not depicted due to TAF being so far below actual activity.

TAF – Terminal Area Forecast

Sources: Historic numbers from USBTS, 2023. TAF forecast from FAA, 2023b.

**Table 3-11 Scammon Bay Freight and Mail: Historic and Forecast**

| | Freight (Pounds) | | | | | Mail (Pounds) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Historic | Forecast | | | % Change | Historic | Forecast | | | % Change |
| | | Low | Medium | High | | | Low | Medium | High | |
| **2013** | 322,374 | | | | | 1,276,885 | | | | |
| **2014** | 312,182 | | | | 97% | 1,601,165 | | | | 125% |
| **2015** | 271,676 | | | | 87% | 1,420,052 | | | | 89% |
| **2016** | 230,477 | | | | 85% | 1,405,888 | | | | 99% |
| **2017** | 241,476 | | | | 105% | 1,297,640 | | | | 92% |
| **2018** | 267,923 | | | | 111% | 1,178,134 | | | | 91% |
| **2019** | 222,633 | | | | 83% | 1,213,643 | | | | 103% |
| **2020** | 266,994 | | | | 120% | 1,234,510 | | | | 102% |
| **2021** | 264,488 | | | | 99% | 1,226,073 | | | | 99% |
| **2022** | 525,625 | | | | 199% | 1,411,696 | | | | 115% |
| **2025** | | 544,916 | 555,413 | 565,910 | 106% | | 1,463,505 | 1,491,698 | 1,519,891 | 106% |
| **2030** | | 586,874 | 587,071 | 586,848 | 106% | | 1,576,195 | 1,576,725 | 1,576,127 | 106% |
| **2035** | | 626,195 | 614,663 | 602,693 | 105% | | 1,681,800 | 1,650,831 | 1,618,682 | 105% |
| **2040** | | 665,645 | 641,094 | 616,555 | 104% | | 1,787,754 | 1,721,817 | 1,655,912 | 104% |
| **2045** | | 706,915 | 668,020 | 630,119 | 104% | | 1,898,595 | 1,794,133 | 1,692,342 | 104% |

Key:

% – percent

% Change is from the Medium Forecast

% Difference between TAF and Population based forecasts are not depicted due to TAF being so far below actual activity.

TAF – Terminal Area Forecast

Sources: Historic numbers from USBTS, 2023. TAF forecast from FAA, 2023b.

**Table 3-12 Aircraft Operations Forecast (Medium Growth)**

| | AAC | ADG | TDG | | 2022 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|---|---|
| Growth Rate | | | | | | 6% | 6% | 5% | 4% | 4% |
| Cessna 208 Caravan | A | II | 1A | S | 2,539 | 2,691 | 2,853 | 2,995 | 3,115 | 3,240 |
| Casa/Nurtanio C212 Aviocar | A | II | 1A | | 340 | 360 | 382 | 401 | 417 | 434 |
| Cessna C206/207/209/210 Stationair | A | I | 1A | S | 173 | 183 | 194 | 204 | 212 | 221 |
| Cessna C208B/Grand Caravan | A | II | 1A | S | 124 | 131 | 139 | 146 | 152 | 158 |
| Piper PA-31 (Navajo)/T-1020 | B | I | 1A | S | 102 | 624 | 661 | 695 | 722 | 751 |
| Gipps Aero Ga8 Airvan | A | I | | | 26 | 28 | 29 | 31 | 32 | 33 |
| Beech 200 Super Kingair | B | II | 2 | | 22 | 23 | 25 | 26 | 27 | 28 |
| Piper PA-32 (Cherokee 6) | A | I | 1A | S | 13 | 14 | 15 | 15 | 16 | 17 |
| Pilatus PC-12 | A | II | 2 | S | 9 | 10 | 10 | 11 | 11 | 11 |
| Cessna 172 Skyhawk | A | I | 1A | S | 2 | 2 | 2 | 2 | 2 | 3 |
| **Total Operations** | | | | | 3,350 | 4,067 | 4,311 | 4,526 | 4,707 | 4,896 |
| **Subtotal** | A | | | | 3,226 | 3,420 | 3,625 | 3,806 | 3,958 | 4,117 |
| | B | | | | 124 | 647 | 686 | 720 | 749 | 779 |
| | | I | | | 316 | 851 | 902 | 947 | 985 | 1,024 |
| | | II | | | 3,034 | 3,216 | 3,409 | 3,579 | 3,723 | 3,872 |

Key:
% – percent
AAC – Aircraft Approach Category
ADG – Airplane Design Group
TDG – Taxiway Design Group

Peak hour operations were not calculated due to the low level of activity. It would be unusual for more than two aircraft to be operating near the facility at the same time.

SCM has a diverse fleet mix, and so this forecast follows the specifications of FAA AC 150/5000-17 Example 8. The forecasted activity is subtotaled by AAC and ADG (Table 3-12), for ease of determination of critical aircraft. Forecasted AAC activity is expected to exceed 500 operations per year for A and B, due to the new Piper PA-31 (Navajo) operations taking place. ADG activity is expected to exceed 500 operations per year for I and II.

#### *3.2.1.2 FAA Forecast*

The FAA (2023b) publishes a forecast of aviation activity for U.S. airports called the Terminal Area Forecast (TAF) (Table 3-10). These estimates forecast a flat 500 total operations for every year at

Scammon Bay. The TAF also provides enplanement forecasts for a flat number of 3,426 into the future (Table 3-10). For un-towered airports, these estimates are often different than actual operations.

When the 5- or 10-year forecast is for less than 100,000 total annual operations or 100 based aircraft, the forecast does not need to be reviewed at FAA Headquarters, but FAA approval is required prior to funding of AIP Projects.

## 3.3 Critical Aircraft

Critical Aircraft are the most demanding aircraft types, or groupings of aircraft with similar characteristics, which make regular use of an airport. Per FAA AC 150/5000-17 “regular use” is defined as at least 500 annual operations, including both itinerant and local operations, but excluding touch-and-go operations. The critical aircraft determines the applicable design standards for facilities on the Airport.

The AAC and ADG categorizes aircraft by aircraft design requirements, specifically approach speed and wingspan. Between 2013 and 2022, only one aircraft had more than 500 annual operations: the Cessna 208 Caravan (Table 3-5).

The forecasted critical aircraft is B-II (S). This is due to the most demanding aircraft exceeding 500 annual operations being a mix of the AAC B Piper PA-31 (Navajo) and the ADG II Cessna 208 Caravan (Tables 3-12 and 3-13). Both are TDG 1A and designated as small aircraft.

**Table 3-13 Critical Aircraft and Projected Aircraft Operations**

| Year | AAC | ADG | TDG | Small? | 2022 | 2025 | 2030 | 2035 | 2040 | 2045 |
|---|---|---|---|---|---|---|---|---|---|---|
| Cessna 208 Caravan | A | II | 1A | S | 2,691 | 2,853 | 2,995 | 3,115 | 3,240 | 2,691 |
| Piper PA-31 (Navajo)/T-1020 | B | I | 1A | S | 102 | 624 | 661 | 695 | 722 | 751 |

Casa C212 (A-II [S]) is worth noting, with 340 annual operations in 2022 and a projected increase to 434 operations in 2045.

# 4 ISSUES

The following is a summary of issues identified in the inventory and through interviews:

1. Runway erosion
2. Runway flooding
3. Cross-runway culvert failure
4. Inadequate crosswind coverage

# 5 FACILITY REQUIREMENTS

## 5.1 Airfield Capacity

The FAA estimates that a single runway has the capacity for 98 VFR and 59 IFR flights per hour, resulting in 230,000 operations per year (FAA, 1983). The High forecast for SCM is 4,896 operations per year. As a result, a single runway is expected to provide adequate capacity for all of the forecasted activity levels.

## 5.2 Security

The SCM is currently unfenced. FAA funds the construction of a fence if there are documented wildlife or security issues. A fence can both prevent unauthorized access to the runway and also trap wildlife. A fence traditionally discourages public use of the runway, but gates are unlikely to be functional because the airlines rely on the public to assist in loading and unloading cargo and mail from aircraft.

## 5.3 Design Standards

The AAC/ADG code is used by the FAA to describe the operational physical characteristics of aircraft operating at an airport. The AAC, designated by letter, represents the Aircraft Approach Category as defined by the aircraft approach speed (Table 5-1). The ADG, designated by roman numeral, represents the Airplane Design Group determined by aircraft wingspan and tail height (Table 5-2). Generally, AAC speed is related to runways and runway-related facilities, while ADG relates primarily to separation criteria involving taxiways and runways.

**Table 5-1 AAC Classifications and Aircraft Classifications**

| Approach Category | Approach Speed (knots) | Typical Aircraft |
|---|---|---|
| **A** | <90 | Cessna 206, Cessna 208 |
| **B** | 91-120 | Piper PA-31 (Navajo) |
| **C** | 121-140 | Lockheed C-130 |
| **D** | 141-165 | MD-11 |

Key: AAC – Aircraft Approach Category; AC – Advisory Circular; FAA – Federal Aviation Administration

Source: FAA AC 150/5300-13B, *Airport Design*

AC 150/5300-13B, *Airport Design*, defines a “small aircraft” as an aircraft with a maximum certificated takeoff weight of 12,500 pounds or less.

**Table 5-2 ADG Classifications and Aircraft Classifications**

| Approach Category | Wingspan (feet) | Typical Aircraft |
|---|---|---|
| **I** | To 48 | Cessna 206, Piper PA-31 (Navajo) |
| **II** | 49-78 | Cessna 208, Casa C212 |
| **III** | 79-117 | De Havilland Dash 8 |
| **IV** | 118-170 | Lockheed C-130, DC-10 |
| **V** | 171-213 | Boeing 747 |
| **VI** | 214-262 | Lockheed C-5B |

Key: AC – Advisory Circular; ADG – Airplane Design Group; FAA – Federal Aviation Administration

Source: FAA AC 150/5300-13B, Change 1, *Airport Design*

The AAC/ADG for Scammon Bay is B-II (S) because the most demanding aircraft exceeding 500 annual operations being a mix of the AAC B Piper PA-31 (Navajo) and the ADG II Cessna 208 Caravan.

## 5.4 Runway Requirements

### *5.4.1 Dimensional Criteria*

The design aircraft for SCM is a B-II (S) (AC 150/5300-13B Section 3.3 and Table G-3). The visibility standard was selected as not less than 1 mile, since the lowest visibility instrument approach (RNAV RW10) is for 1.25 statue-mile visibility.

Table 5-3 shows the Existing Conditions, FAA design criteria, and Recommendations.

### *5.4.2 Orientation*

Wind coverage for the runway is 83.97% for 10.5 knot crosswinds, and 90.4% coverage for 13 knot crosswinds. For the Critical Aircraft (B-II [S]), the allowable crosswind component is 13 knot winds.

No orientation of a single runway can meet the 95% crosswind criteria.

For wind coverages less than 95%, development of a crosswind runway should be evaluated. If terrain does not allow for a crosswind runway, increasing the runway dimensions to the next largest ARC requirements should be considered (AC 150/5300-13B, Appendix B Wind Analysis, B.2.3.2).

At SCM, terrain makes the creation of a crosswind runway cost prohibitive. This report recommends increasing the runway dimensions to the next largest ARC requirements (B-III) for runway width while maintaining B-II requirements for the RSA, ROFZ, and RPZ.

**Table 5-3 Runway Design Standards**

| | Runway 10/28 (Existing) | Design Aircraft (Alone) | Recommendation |
|---|---|---|---|
| **Orientation: Crosswind Coverage** | 90.4% | 90.4% | 90.4% & Increase to B-III standard |
| **Runway Length** | 3,000 feet | 2,700 feet | 3,200 feet* |
| **Runway Width** | 75 feet | 75 feet | 100 feet** |
| **RSA Width** | 150 feet | 150 feet | 150 feet |
| **RSA Length (beyond runway threshold)** | 300 feet | 300 feet | 300 feet |
| **ROFZ Width** | 250 feet | 250 feet | 250 feet |
| **ROFZ Length (beyond runway threshold)** | 200 feet | 200 feet | 200 feet |
| **ROFA Width** | 500 feet | 500 feet | 500 feet |
| **ROFA Length (beyond runway threshold)** | 300 feet | 300 feet | 300 feet |
| **RPZ Inner Width** | 250 feet | 250 feet | 250 feet |
| **RPZ Outer Width** | 450 feet | 450 feet | 450 feet |
| **RPZ Length** | 1,000 feet | 1,000 feet | 1,000 feet |
| **Taxiway Width** | 35 feet | 35 feet | 35 feet |

Key:
* 3,200 feet recommended due to instrument approach AC 150/5300-13B Table K-1
** Increase in width to B-III to accommodate for lack of crosswind coverage AC 150/5300-13B, Appendix B.2.3.2
% – percent
AC – Advisory Circular
ROFA – runway object free area
ROFZ – runway object free zone
RPZ – Runway Protection Zone

### *5.4.3 Length*

Runway length requirements are determined by analyzing the airport’s Critical Aircraft. The recommended length for the primary runway is determined by considering the aircraft type, or family of aircraft with similar performance characteristics, that is forecast to use the runway on a regular basis in tandem with FAA AC 150/5325-4B *Runway Length Requirements for Airport Design* (FAA, 2005). Departures are the primary consideration in the runway length analysis since they typically require more runway length than landings.

Runway length requirements are determined based on several variables which include the airport’s mean high temperature for the hottest month of the year (July, 57° Fahrenheit) and elevation (22 feet MSL). The FAA recommends using figures for coverage of 95% of the fleet, because Scammon Bay is not near a major metropolitan area. The recommended runway length for small aircraft with more than 10 passengers is 2,700 feet (Table 5-4) (disregarding instrument approaches).

**Table 5-4 Runway Length Requirements**

| Category | Length | Recommendation |
|---|---|---|
| **Weather, Critical Airport, and Facility Based *** | 2,700 feet | |
| **Instrument Approach Based**** | 3,200 feet | x |
| **Manufacturer Published** | **Takeoff Ground Roll** | |
| Cessna 208 Caravan | 1,160 feet | |
| Cessna 206 | 1,060 feet | |

Key:
* FAA Design Standard 150/5325-4B
**FAA Design Standard 150/5300-13B
Takeoff Ground Roles from Cessna (https://cessna.txtav.com/).
FAA - Federal Aviation Administration

Since SCM has an instrument approach, the FAA publishes additional recommendations for runway length. For runways with instrument approaches, the runway should meet the 3,200-foot minimum length requirement for instrument approaches from AC 150/5300-13B Table K-1.

In addition, the manufacturers' performance calculations were referenced for the two mostly commonly used aircraft at Scammon Bay (Table 5-4). In addition to the C208 and C206, the Casa 212 Aviocar should be considered, although it has less reliable information available on takeoff ground roll (one available datapoint is 1,312-foot ground roll advertised in an aircraft listing [https://www.globalair.com/aircraft-for-sale/specifications?specid=944]). Weight and other characteristics will change the ground roll requirements.

As a result of the preceding discussion, the recommended runway length for SCM is 3,200 feet.

### *5.4.4 Width*

FAA AC 150/5300-13B, *Airport Design*, states that runways serving B-II (S) aircraft, with a visibility of no less than 1 mile, have a width of 75 feet (FAA, 2022). The width of the existing runway at Scammon Bay is 75 feet (Table 5-5).

Runway width design should also consider crosswinds. If a single runway airport does not meet the required crosswind coverage, such as is the case at SCM, AC 150/5300-13B, Appendix B Wind Analysis, B.2.3.2 allows for a wider runway when a crosswind runway is impractical or cost-prohibitive. This wider runway would be a B-III runway standard width of 100 feet.

**Table 5-5 Runway Width Requirements**

| Category | Width | Recommendation |
|---|---|---|
| Existing | 75 feet | |
| Critical Aircraft Design (B-II) | 75 feet | |
| Crosswind Increase (B-III) | 100 feet | x |

Key:
FAA – Federal Aviation Administration
Source: FAA Design Standard 150/5325-4B

Since no orientation of a single runway at Scammon Bay can meet the 95% crosswind criteria and the construction of a crosswind runway is impractical and/or cost-prohibitive, an increase in runway width to 100 feet is recommended.

### *5.4.5 Airfield Safety Areas*

This section presents FAA design standards for various airfield safety areas. The following airfield safety areas are reviewed in this section:

- Runway Safety Area (RSA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Object Free Area (ROFA)
- Runway Protection Zone (RPZ)

**Runway Safety Area.** The RSA is a critical, two-dimensional area surrounding the runway. The RSA should be:

- Cleared, graded, and free of potentially hazardous surface variations.
- Properly drained.
- Capable of supporting snow removal equipment, and aircraft (without causing damage to the aircraft).
- Free of objects except those mounted on low-impact resistant (frangible) supports and whose location is fixed by function.

The RSA at Scammon Bay is 150 feet wide, centered on the runway centerline, and extends 300 feet beyond the ends of the runway.

Current FAA standards require a B-II (S) RSA to be 150 feet wide and extend 300 feet beyond the ends of the runway.

This report recommends maintaining the B-II (S) standard for SCM, instead of a larger B-III standard, due to cost-prohibitive terrain.

**Runway Obstacle Free Zone.** The ROFZ is a three-dimensional volume of airspace that supports the transition of ground to airborne operations or vice versa. The ROFZ is centered above the runway centerline. The ROFZ clearing standards prohibit airplanes from taxiing and parking in the ROFZ during operations. Also, only objects that are frangibly mounted and needed for the safe movement of aircraft operations are allowed to penetrate the ROFZ.

The ROFZ at Scammon Bay is 250 feet wide and extends 200 feet beyond each end of the runway.

Current B-II (S) standards require that the ROFZ be 250 feet wide and extend 200 feet beyond the end of each runway.

This report recommends maintaining the B-II (S) standard for SCM, rather than adopting the B-III standard, due to cost-prohibitive terrain.

**Runway Object Free Area.** The ROFA is a two-dimensional ground area that surrounds the runway. FAA standards prohibit parked aircraft and objects from residing in the ROFA, with the exception of Navigational Aids (NAVAIDs) or objects that are frangibly (low-impact resistant) mounted.

The ROFA at Scammon Bay is 500 feet wide and extends 300 feet past each end of the runway.

Current B-II (S) standards require the ROFA to be 500 feet wide and extended 300 feet beyond each runway end.

This report recommends maintaining the B-II (S) standard for SCM, instead of adopting the B-III standard, due to cost-prohibitive terrain.

**Runway Protection Zone.** The RPZ is a two-dimensional, trapezoidal surface that is centered on the extended runway centerline. The function of the RPZ is to enhance the protection of people and property on the ground, typically achieved by airport control through land acquisition. The RPZ is primarily a land-use planning tool. The RPZ begins past the runway threshold.

The RPZ at Scammon Bay is 250 feet by 450 feet by 1,000 feet long. The Airport owns or has easements for all of the RPZ, but some of the RPZ overlaps with frequently used areas such as the river and boat landing area.

Current B-II (S) standards require the RPZ for an A/B-II Small Aircraft runway to be 250 feet by 450 feet by 1,000 feet long.

This report recommends maintaining the B-II (S) recommendation for SCM, instead of adopting the B-III standard, due to cost-prohibitive terrain.

## 5.5 Approach and Departure Threshold Siting Surfaces

Threshold Siting Surfaces (TSS) protect the use of the runway and allow pilots to follow standard approach and departure procedures. The FAA requires TSSs be clear of obstacle penetrations. The approach TSS slope for approach ends of runways with non-precision approaches only providing lateral guidance and visibility minimums greater than or equal to ¾ statute mile is 20:1. The departure slope standard is 40:1 for all instrument operations. The specific dimensions are described in AC 150/5300-13B.

## 5.6 Runway Line of Sight

For runways without a full parallel taxiway, the design standard is that any point 5 feet above the runway centerline must be mutually visible with any other point 5 feet above the runway centerline.

Existing runway conditions at Scammon Bay meet current line of sight design standards. SCM has a 5-foot line-of-sight that is mutually visible. The runway has a difference in elevation between the runway ends of 5.5 feet, with the higher end being on the eastern side, away from the river.

## 5.7 Taxiway Requirements

### *5.7.1 Taxiway Design Group*

Taxiways are based on Taxiway Design Groups (TDG). The TDG is determined using a combination of the longest Cockpit to Main Gear Distance and widest Main Gear Width (MGW) of a theoretical airplane using the taxiway. TDG establishes standards for taxiway and taxiway shoulder width, while the ADG determines Taxiway Safety Area (TSA) and Taxiway Object Free Area (TOFA) widths.

The Cessna 208 Caravan and Piper PA-31 (Navajo) are currently the critical aircraft, with a TDG 1A determination (Table 5-6). The other common aircraft are also TDG 1A. According to FAA AC 150/5300-13B, *Airport Design*, TDG 1A airports require 25-foot-wide taxiways with 10-foot shoulders (FAA, 2022).

**Table 5-6 Taxiway Design Group Requirements**

| Category | Width | Recommendation |
|---|---|---|
| Existing | 35 feet | x |
| Critical Aircraft Design (TDG 1A) | 25 feet +<br>10-foot shoulders | |

Key: TDG – Taxiway Design Group

Source: FAA Airport Design 150/5300-13B

This report recommends maintaining the TDG 1A standard for SCM, instead of adopting the standard of a larger category, due to cost-prohibitive terrain.

## 5.8 Aprons

Scammon Bay currently has one 250-foot by 350-foot apron with a gravel surface.

## 5.9 Airspace

The FAR Part 77 Surfaces are discussed below.

**Primary Surface.** The 2004 ALP for SCM indicates that there are no penetrations of the Primary Surface.

**Transitional Surface.** The 2004 ALP for SCM indicates that there are no obstructions to the Transitional Surface.

**Horizontal Surface.** The 2004 ALP for SCM indicates that there are terrain obstructions to the Horizontal Surface.

**Conical Surface.** The 2004 ALP for SCM indicates that there are multiple terrain obstructions to the Conical Surface.

**Approach Surface.** The 2004 ALP for SCM indicates that there are no terrain obstructions to the Approach Surface.

## 5.10 Passenger and Cargo Loading/Unloading

### *5.10.1 Airside Requirements*

Current aircraft operations at SCM use the runway for taxiing, with parking available on the apron. Aircraft are seldom parked for long periods on the apron; most aircraft stop to load, unload, and takeoff again.

Services are not typically provided to aircraft, and fuel is not available for purchase. Scheduled commuter flights must purchase fuel elsewhere.

### *5.10.2 Passenger and Cargo Facilities*

There are no passenger terminal or cargo facilities at SCM. Passengers wait in the weather for flights or listen for the arriving aircraft prior to leaving home. This procedure functions when the airport is located close to the community, and it increases convenience when actual arrival times of scheduled aircraft vary widely.

As a result, one consequence of relocating the Airport would be an increase in hardship for passengers. There are no passenger facilities at SCM and there are few closed-cabin vehicles in the community. All-Terrain Vehicles are the most common mode of transportation. If the distance to the Airport is increased, the community would have greater difficulty in taking advantage of the Airport during inclement weather.

Cargo handling is completed by passengers or volunteers from the community. There is no area for storing cargo.

### *5.10.3 Landside Requirements*

There is no parking or traffic circulation provided at SCM.

### *5.10.4 Passenger Convenience and Access to Airport Facilities*

Passenger services are inconvenient at SCM. There are no airport facilities for passengers to access. There is no shelter for passengers. Parking is not provided at the Airport, and passengers are encouraged to act as cargo and baggage handlers.

## 5.11 General Aviation Requirements

There are no general aviation facilities at SCM. Transient airport parking can take place at the apron, although no tie downs are provided.

## 5.12 Air Cargo Requirements

Air cargo is primarily brought in on regularly scheduled passenger service. There are no air cargo facilities. The public helps load and unload air cargo, which amounts to ~3,400 pounds of freight per capita per year.

## 5.13 Support Facilities

### *5.13.1 Airport Maintenance*

Two SREBs are located along the apron at SCM. Airport maintenance is provided by a DOT&PF contractor.

## 5.14 Utilities

SCM is connected to the community power and telecommunications system. No other utilities are provided.

## 5.15 Land Use

A community road to the community port is present on Airport property.

The solid waste facility is located closer than 5,000 feet to the runway.

# 6 ENVIRONMENTAL OVERVIEW

This section is intended to provide a brief environmental overview of the major environmental constraints at the current Scammon Bay Airport. A more detailed environmental review for off-airport alternative analysis will be provided in the Feasibility Study environmental review.

## 6.1 Biotic Resources

### *6.1.1 Threatened and Endangered Species*

SCM is listed by the National Marine Fisheries Service (NMFS, 2023) as adjacent to potential habitat for species listed under the Endangered Species Act, including:

- Endangered Species
    - Fin whale
    - North Pacific right whale
    - Humpback whale
- Threatened Species
    - Bearded Seal
    - Ringed Seal

SCM is also listed by the U.S. Fish and Wildlife Service (USFWS) as potential habitat for species listed by the Endangered Species Act (USFWS, 2023). These species include:

- Endangered Species
    - Short-Tailed Albatross
- Threatened Species
    - Polar Bear
    - Wood Bison
    - Spectacled Eider
    - Steller’s Eider

Of those species, the only critical habitat near SCM is for Polar Bear, which is directly adjacent to the Airport. As a note, critical habitat for the Spectacled Eider and Steller's Eider is present in the larger Study Area, but not near the Airport (USFWS, 2023).

### *6.1.2 Marine Mammals*

Species with habitat adjacent to the Airport that do not fall under the Endangered Species Act but that are protected under the Marine Mammal Protection Act include the spotted seal (NMFS 2023).

Huntington, Nelson, and Quakenbush (2017) report on traditional knowledge interviews held with Scammon Bay residents in January 2017. Interviewees reported the importance and presence of ringed seals, spotted seals, bearded seals, walrus, and beluga whales in the area. The Kun River was reported as important for young, bearded seal summer habitat. Other species reported by interviewees in the region include ribbon seals, sea lions, killer whales, porpoises, and sea otters.

### *6.1.3 Birds*

The FAA's Alaska Supplement warns pilots that the runway hosts birds.

The USFWS lists the immediate area around the Airport as being occupied by Black Turnstones, a Bird of Conservation Concern, which is most likely present in May, June, and July (USFWS, 2023). As a note, the larger Study Area also hosts birds identified by the USFWS as vulnerable (i.e., Common Eider, Long-tailed Duck, Red-breasted Merganser, Red-throated Loon) (USFWS, 2023).

The USFWS recommends time periods in which to avoid vegetation clearing and consequent impacts to migratory birds. These time periods are from May 5 through July 25 (in areas with Black Scoter the time period is May 20 through August 10, and in areas with Canada Geese the time period is April 20 through July 25).

### *6.1.4 Fish*

The Kun River is listed as an Anadromous Water by the Alaska Department of Fish and Game for chum salmon, inconnu/sheefish, and whitefishes (Giefer and Graziano, 2023).

The cross-runway culvert has not recently been sampled to determine if it provides fish habitat. The 1991 Environmental Assessment for SCM reports that blackfish inhabit the creek flowing under the runway (ADOT&PF, 1991).

## 6.2 Floodplains and Coastal Erosion

Scammon Bay is not part of the Federal Emergency Management Agency floodplain mapping program.

SCM is subject to flooding and erosion. This analysis is presented more fully in the Coastal Report (HDR 2022a) and earlier in this document.

## 6.3 Parklands, Recreational Areas

There are no designated parklands or recreational areas near the Airport. The immediate area surrounding the Airport (within at least 3 miles) is owned by Alaska Native organizations.

Scammon Bay is surrounded by the Yukon-Delta National Wildlife Refuge. The refuge is a patchwork of land ownership, but no parcel is closer than 3 miles to SCM.

A 17b easement crosses Airport property (Figure 6-1). 17b easements were created by the Alaska Native Claims Settlement Act and allows for public use for access to lands and waterways.

An RS2477 trail exists off Airport property, extending east from Scammon Bay (Figure 6-1). RS2477 trails were created by the Mining Law of 1866 and provide for access across lands.

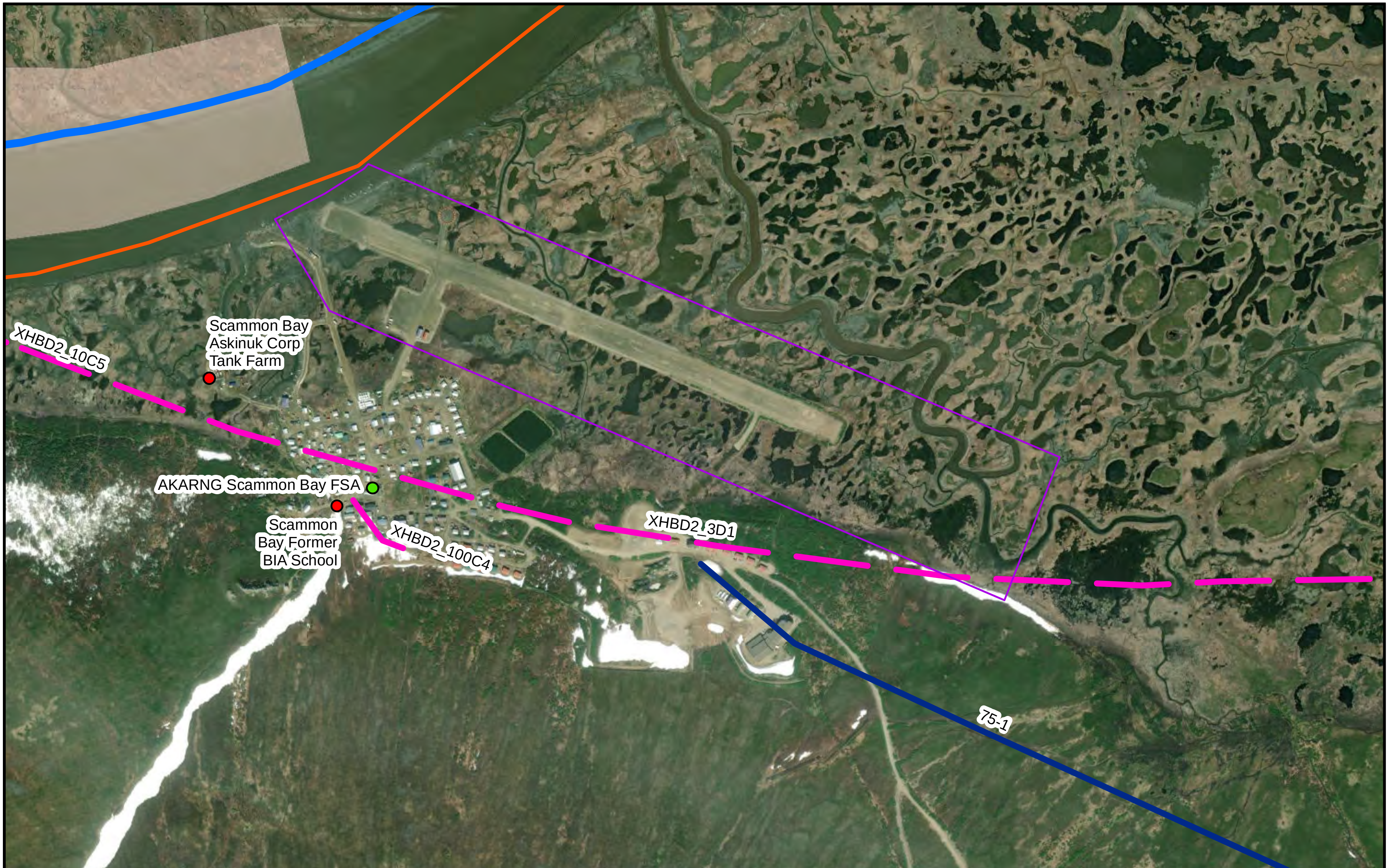
## 6.4 Cultural Resources

No cultural survey has been completed for this planning study.

## 6.5 Noise

Aircraft approach and depart directly adjacent to the community of Scammon Bay. This subjects the community to airplane noise.

In many rural Alaskan communities, aircraft noise is not seen as a negative impact but rather as a welcome reminder of the connection to the larger hub communities and infrastructure.

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Study Area
Airport Boundary
**DEC Contaminated Sites**
Active
Cleanup Complete
Anadromous Waters
17b Easement
RS2477 Trails
Polar Bear Critical Habitat

**Notes:**
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

SCAMMON BAY
AIRPORT PLANNING STUDY

STATE OF ALASKA
Department of Transportation and Public Facilities
4111 Aviation Ave, Anchorage, Alaska 99516

November 2023

Figure 6-1: SCM Environmental

## 6.6 Hazardous Materials and Storage

The Alaska Department of Environmental Conservation contaminated sites atlas reports two Active and one Cleanup Complete contaminated site off Airport property (ADEC 2023). The active sites are the Askinuk Corporation Tank Farm and the former Bureau of Indian Affairs school (Figure 6-1). At the tank farm, 7,000 gallons of gasoline were spilled into the environment and sheens were observed in the Kun River. At the school, diesel contamination was found to extend from the surface to at least 6 feet below surface.

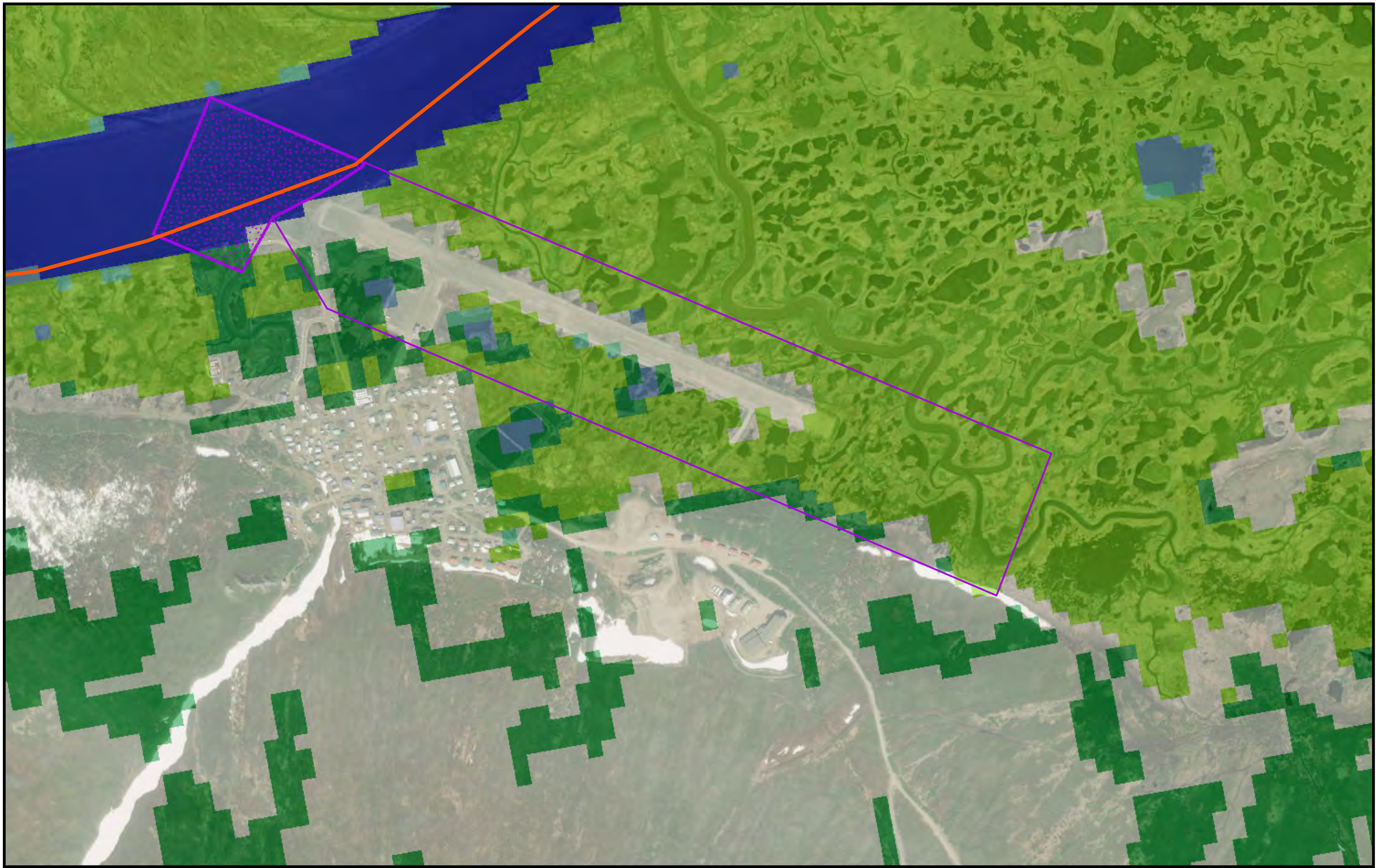
On SCM, there is storage of some fuel and small amounts of hazardous materials to operate the Airport maintenance equipment.

## 6.7 Solid Waste

The community solid waste facility is located approximately 3,560 feet southeast of the runway edge (Figure 1-3). The previous dump was adjacent to Airport property, and this new facility is located farther away.

## 6.8 Wetlands

There is no National Wetland Inventory coverage for the Scammon Bay area. A wetland study will be required if development is undertaken. The current best available wetland information is provided by the University of Alaska Anchorage’s Alaska Vegetation and Wetland Composite (Flagstad et al., 2018). This uses aerial imagery signatures to provide estimated vegetation and wetland mapping. Figure 6-2 indicates that much of the lowland areas surrounding Scammon Bay are wetlands, while the surrounding foothills are uplands.



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Study Area
Airport Boundary
Easement - Polygon

**Vegetation Map**
Wetland
Emergent Wetland
Forested/Shrub Wetland
Pond; Lake
Riverine
Upland

Notes:
1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet

SCAMMON BAY
AIRPORT PLANNING STUDY

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Figure 6-2: SCM Vegetation

## 6.9 Land Status

Beyond the land status discussed in the inventory, there is an aviation easement off the end of RW10, over the Kun River.

The Airport property is in a management agreement between the DOT&PF and State of Alaska Department of Natural Resources.

The community road accessing the community dock is located on Airport property.

The Airport access road has a basketball court encroaching on the road.

Scammon Bay is surrounded by the Yukon-Delta National Wildlife Refuge.

## 6.10 Energy Supplies, Natural Resources, and Sustainable Design

Scammon Bay has a material site located inside of the community (Figure 1-3). In the past, the community has voiced opposition to using this material source for Airport projects. The community would like to reserve that material for local needs. Given Scammon Bay’s geographical position, there may be additional material available near the community; or material may need to be barged in. Barging materials typically adds substantial costs to projects in rural Alaska.

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