

APPENDIX B: FORECAST, INVENTORY, ISSUES, FACILITY REQUIREMENTS

Scammon Bay Airport Planning Study

February 2024

Forecast, Inventory, Issues, Facility Requirements

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



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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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LIST OF ACRONYMS

°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

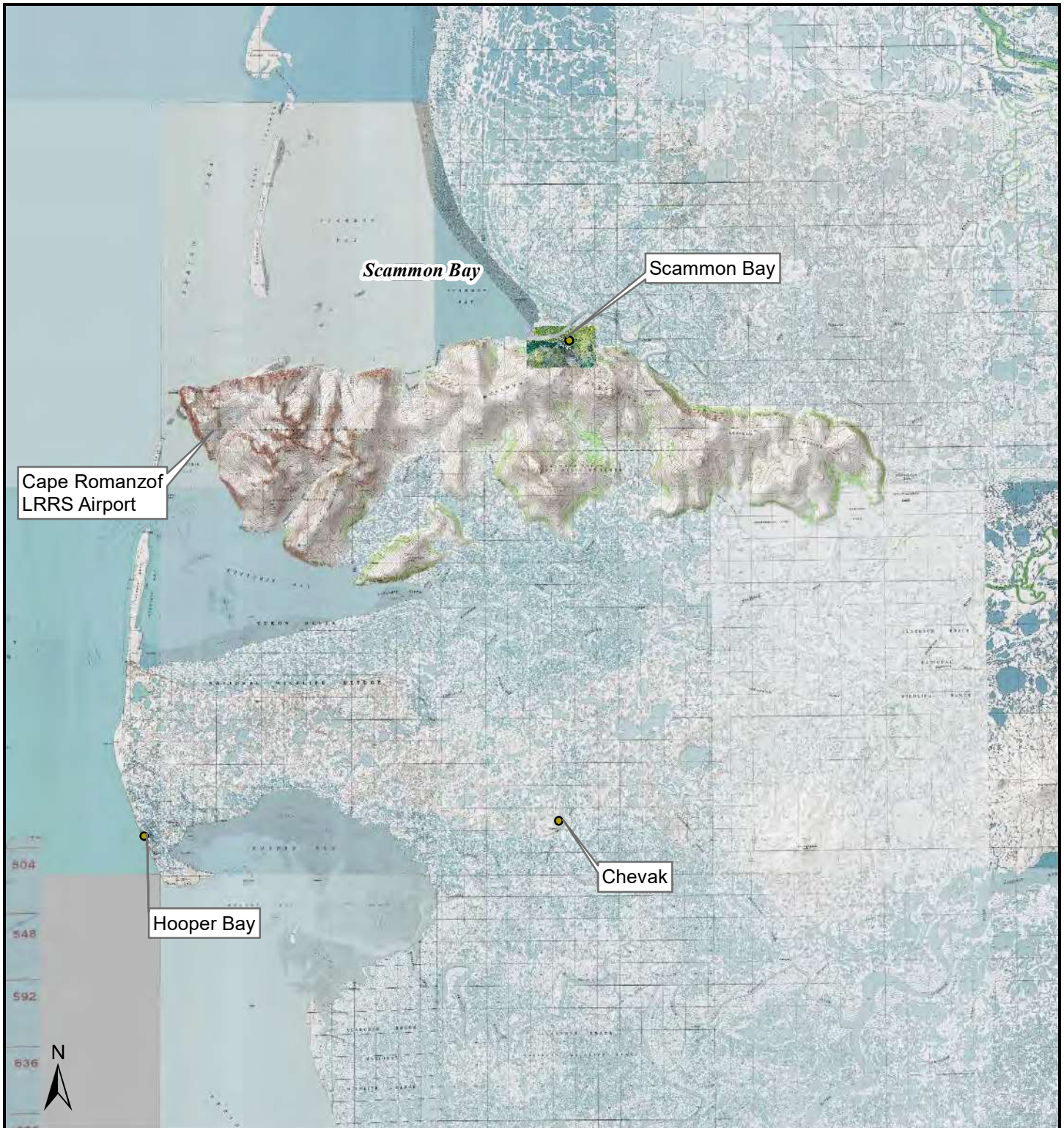
Key:

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.

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SCAMMON BAY AIRPORT PLANNING STUDY

November 2023

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

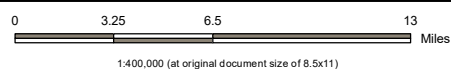
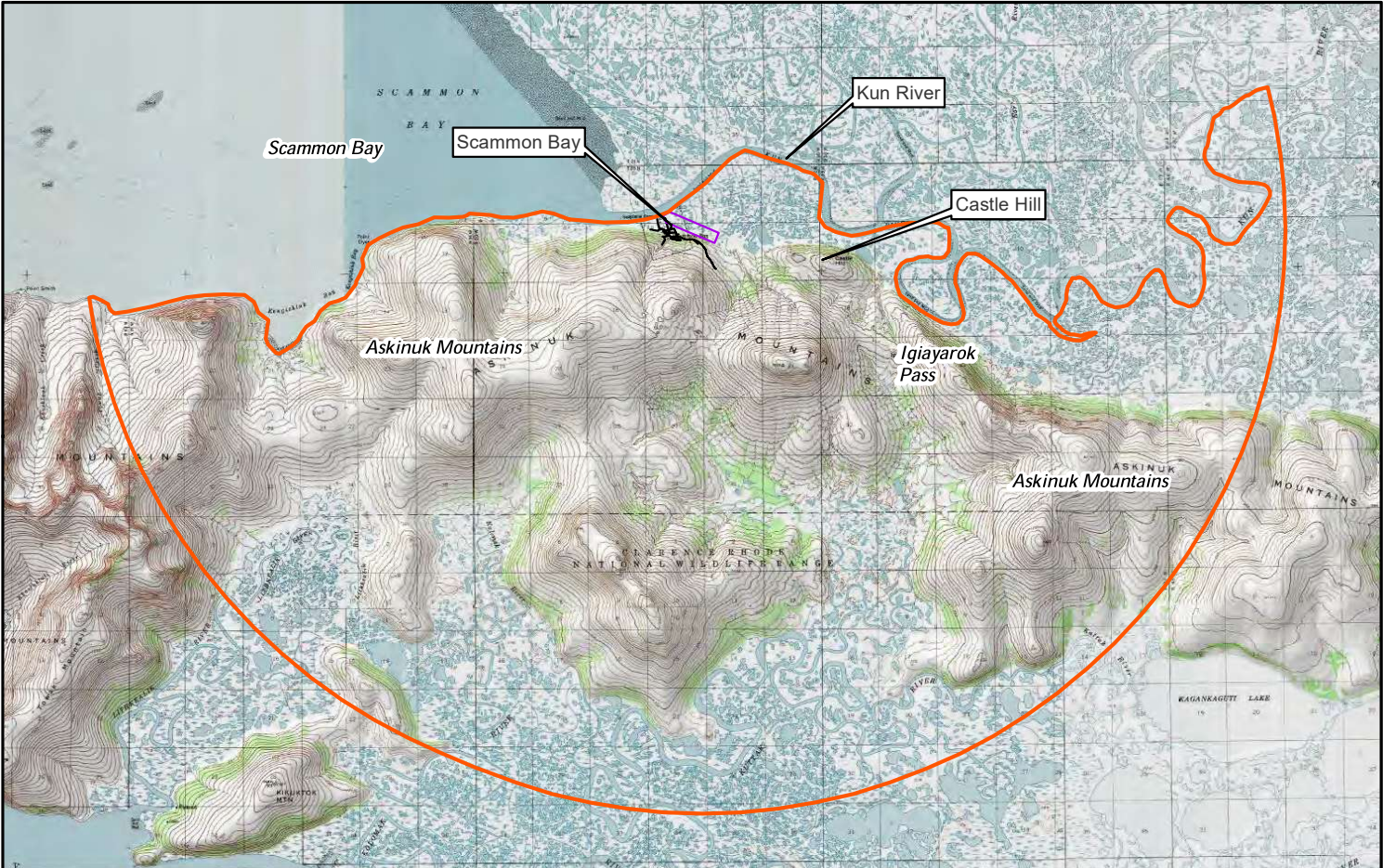





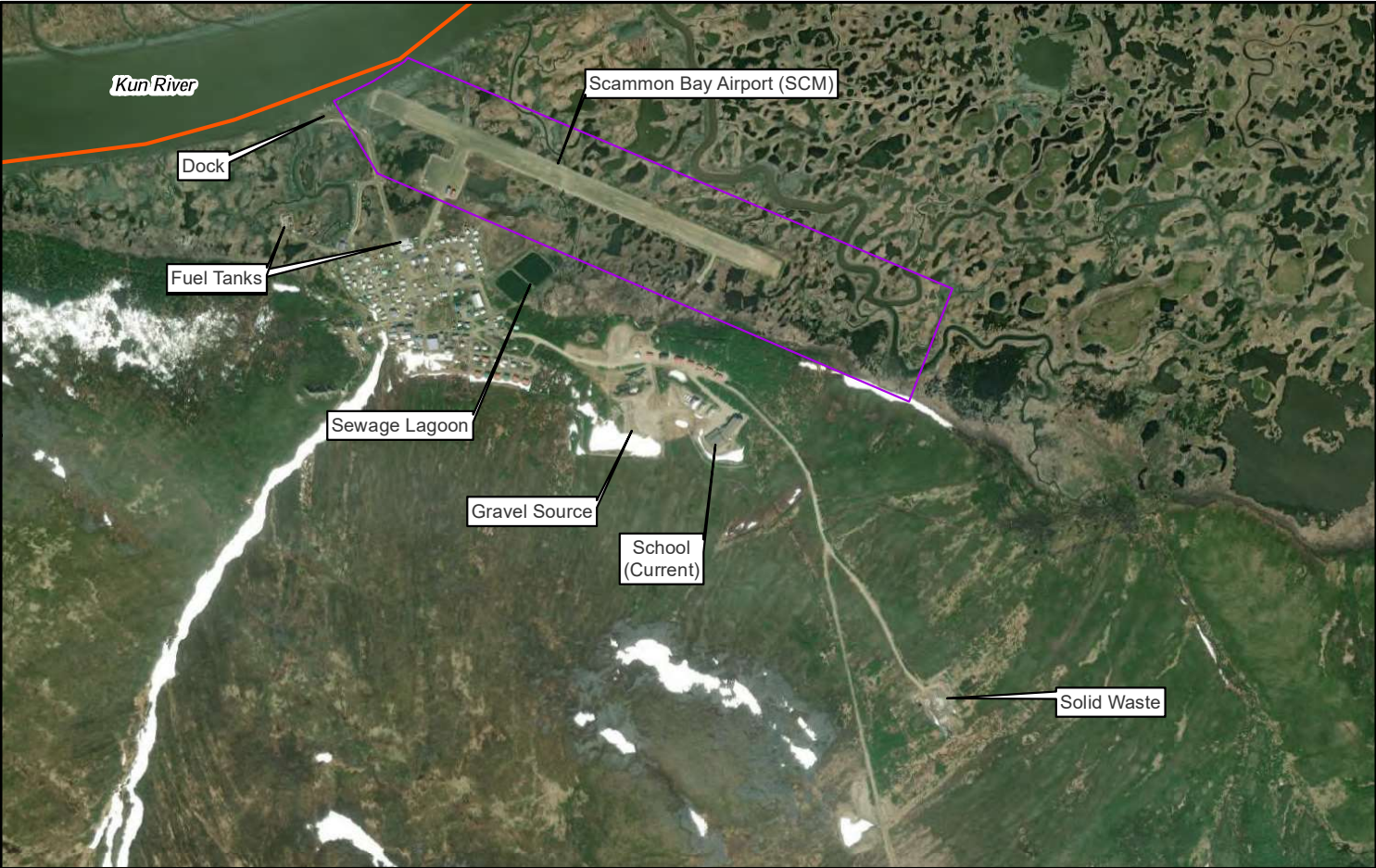


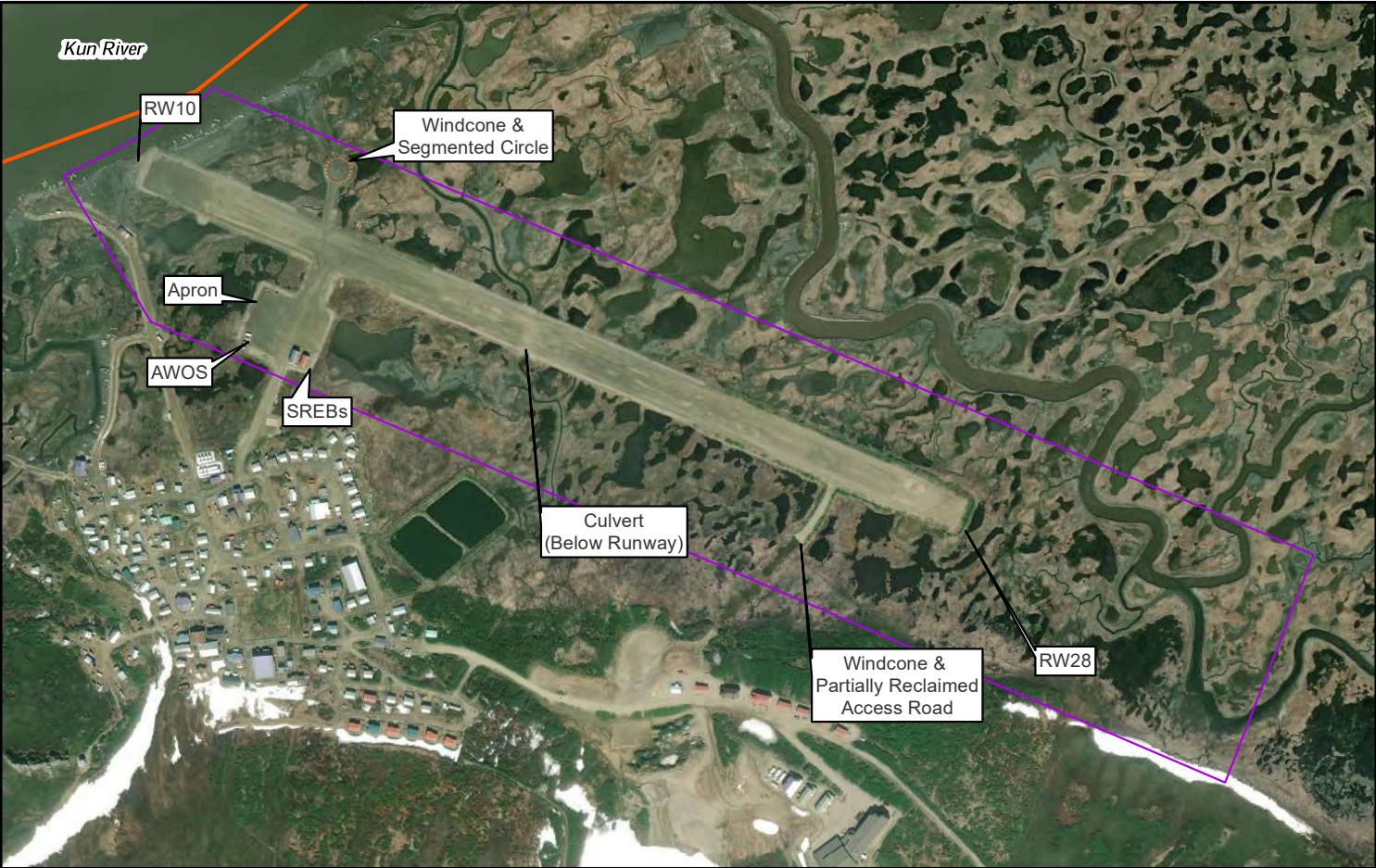
Figure 1-1: Project Location
and Vicinity Map



  1:150,000 (At original document size) Notes: 1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet	 Study  Airport Boundary  Road	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



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	STATE OF ALASKA Department of Transportation and Public Facilities 4111 Aviation Ave, Anchorage, Alaska 99516	
	November 2023	Figure 1-3: Scammon Bay



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	STATE OF ALASKA Department of Transportation and Public Facilities 4111 Aviation Ave, Anchorage, Alaska 99516	
	January 2024	Figure 1-4: Scammon Bay Airport (SCM)

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.



*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.



*2016 flooding of airport from view of an approaching aircraft



*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 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

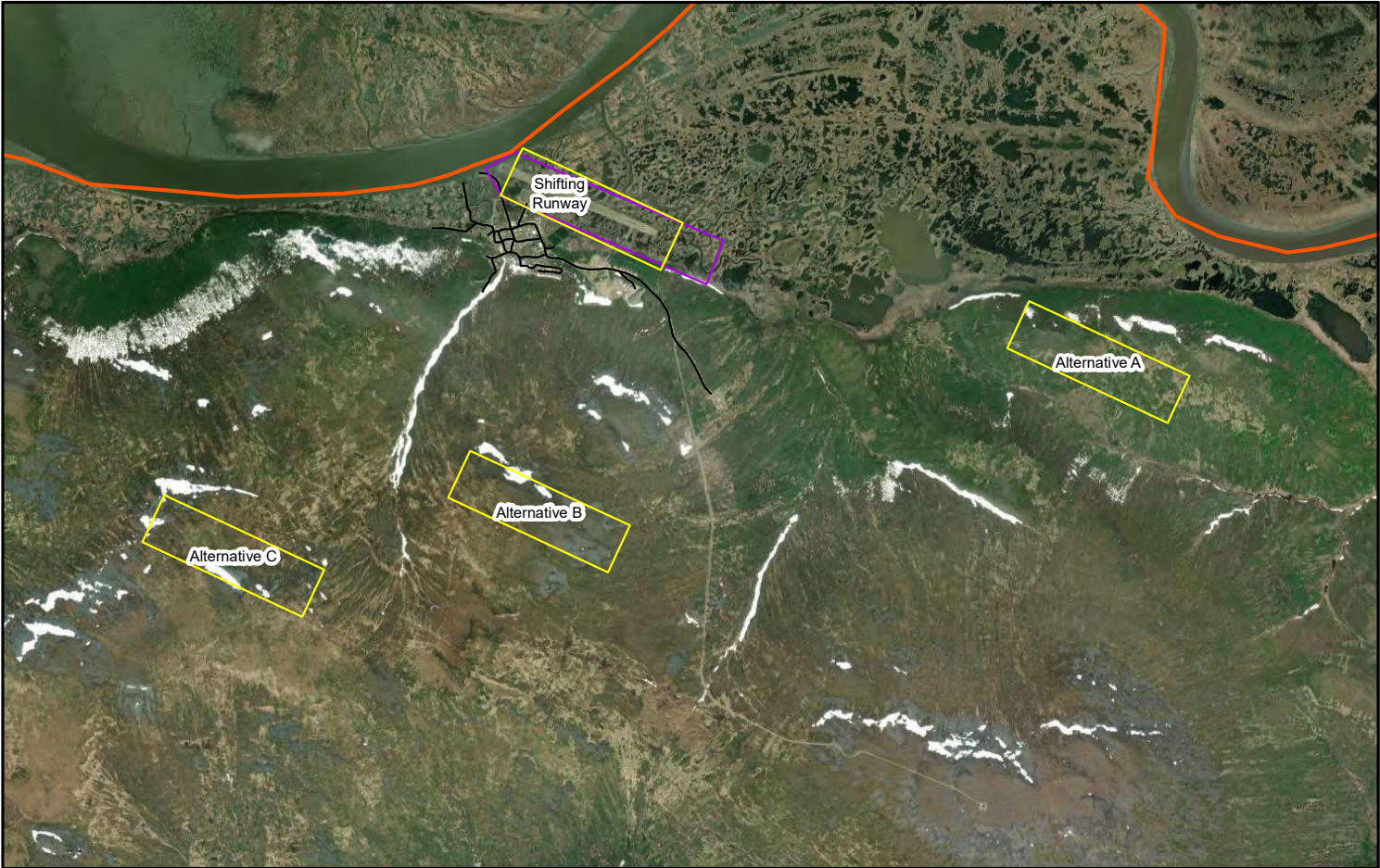
2.1.1 Past Planning Efforts







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.



  1:35,278 (At original document size) Notes: 1. Coordinate System: NAD 1983 2011 StatePlane Alaska 8 FIPS 5008 Feet	 Study Area  Airport Boundary  2019 Alternative  Road	SCAMMON BAY AIRPORT PLANNING STUDY	
		STATE OF ALASKA Department of Transportation and Public Facilities 4111 Aviation Ave, Anchorage, Alaska 99516	
		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.

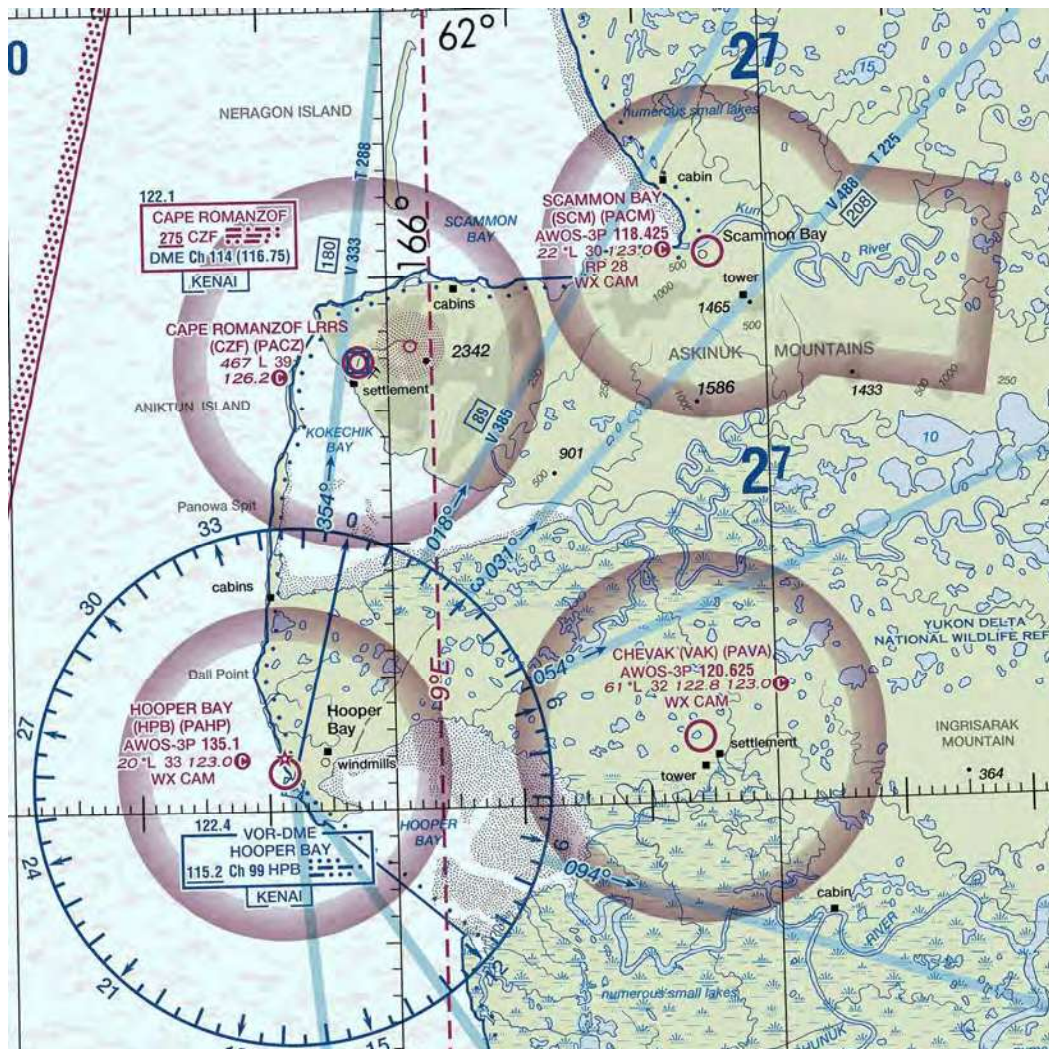
There is one non-standard condition shown on the ALP:

- 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 statute-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 statute-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 statute-miles of visibility.

RNAV (GPS)-B is an approach requiring that at 760 feet, there is 2.25 statute-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

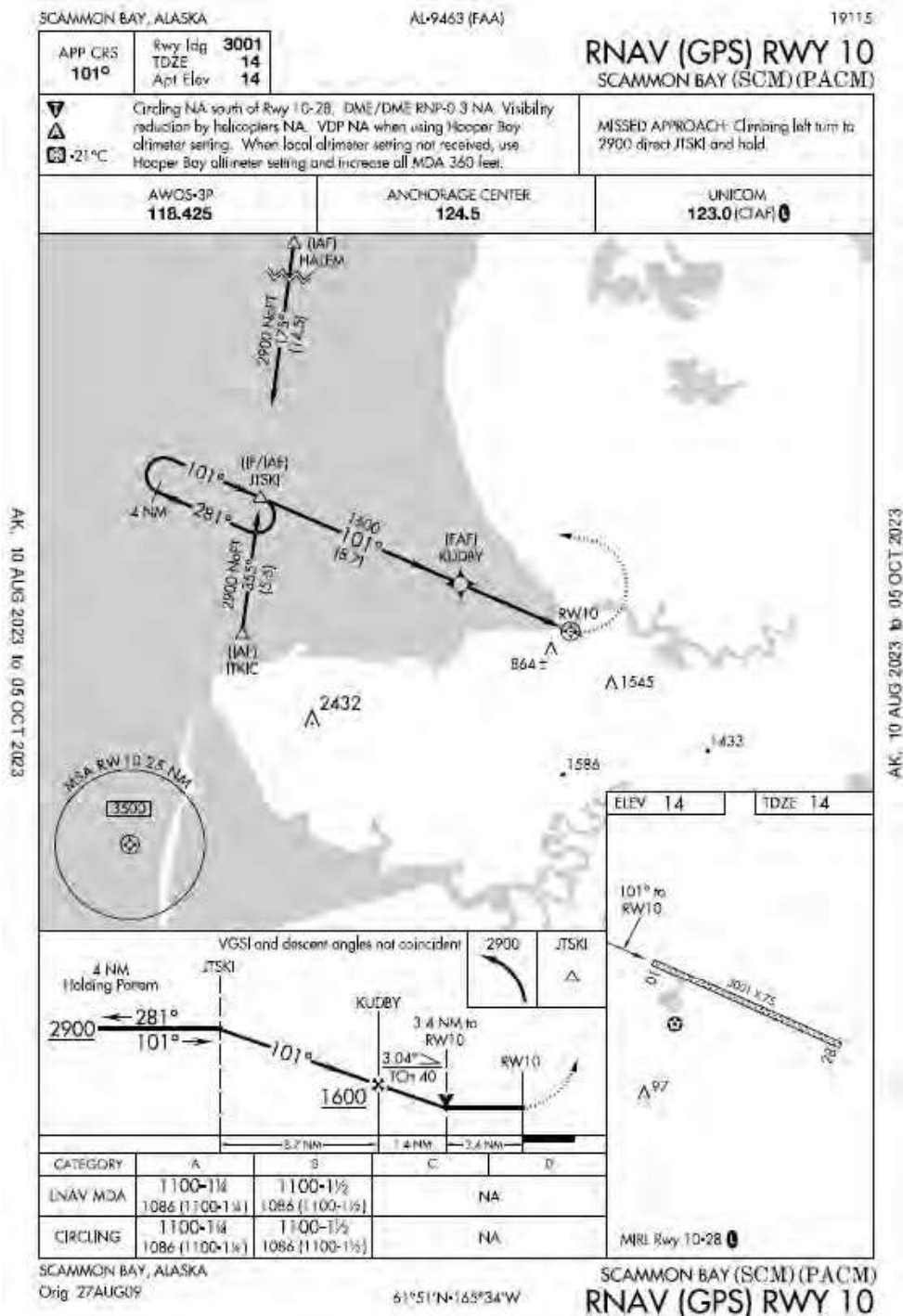


Figure 2-4 Instrument Approach RNAV (GPS) RWY 28

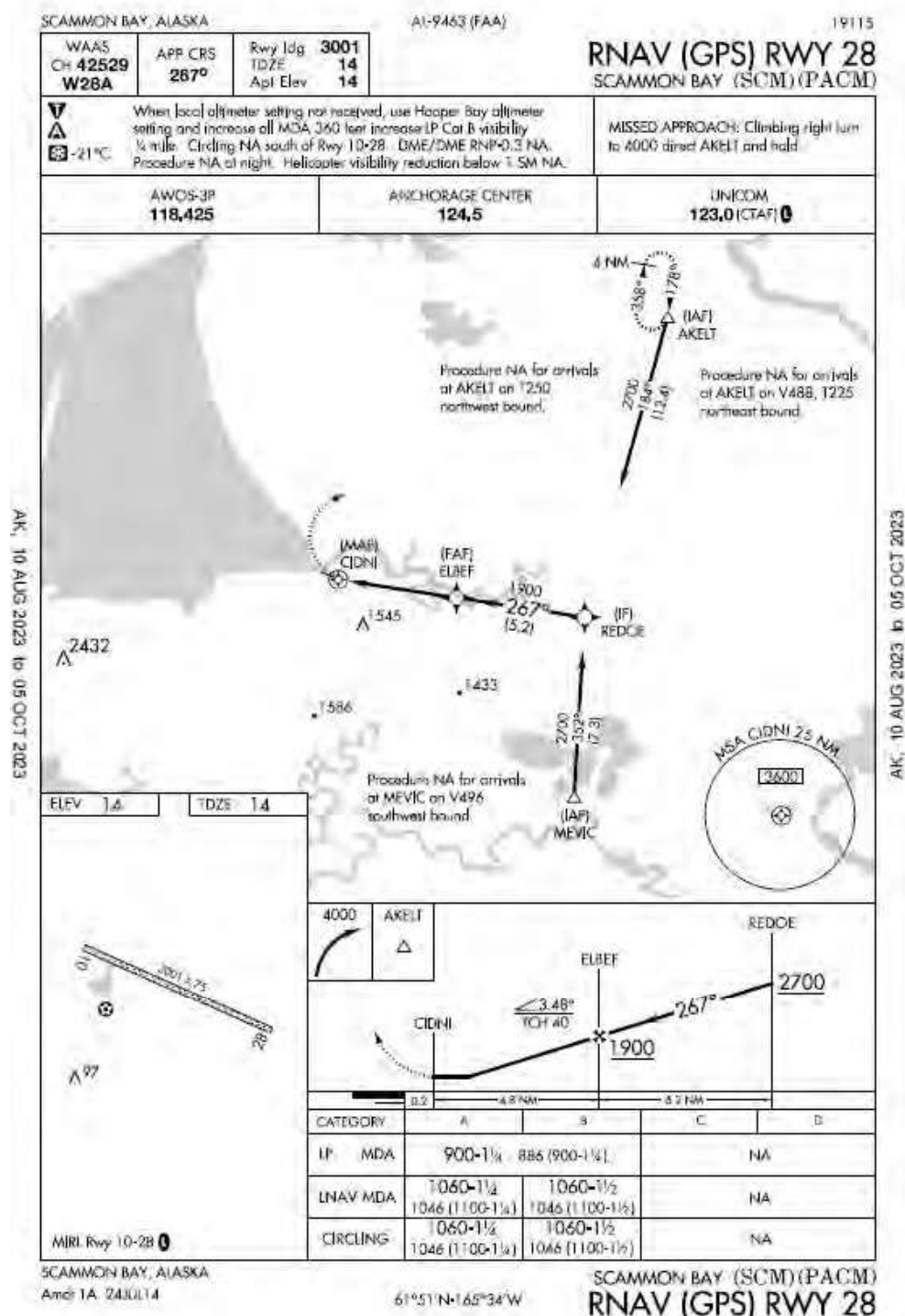
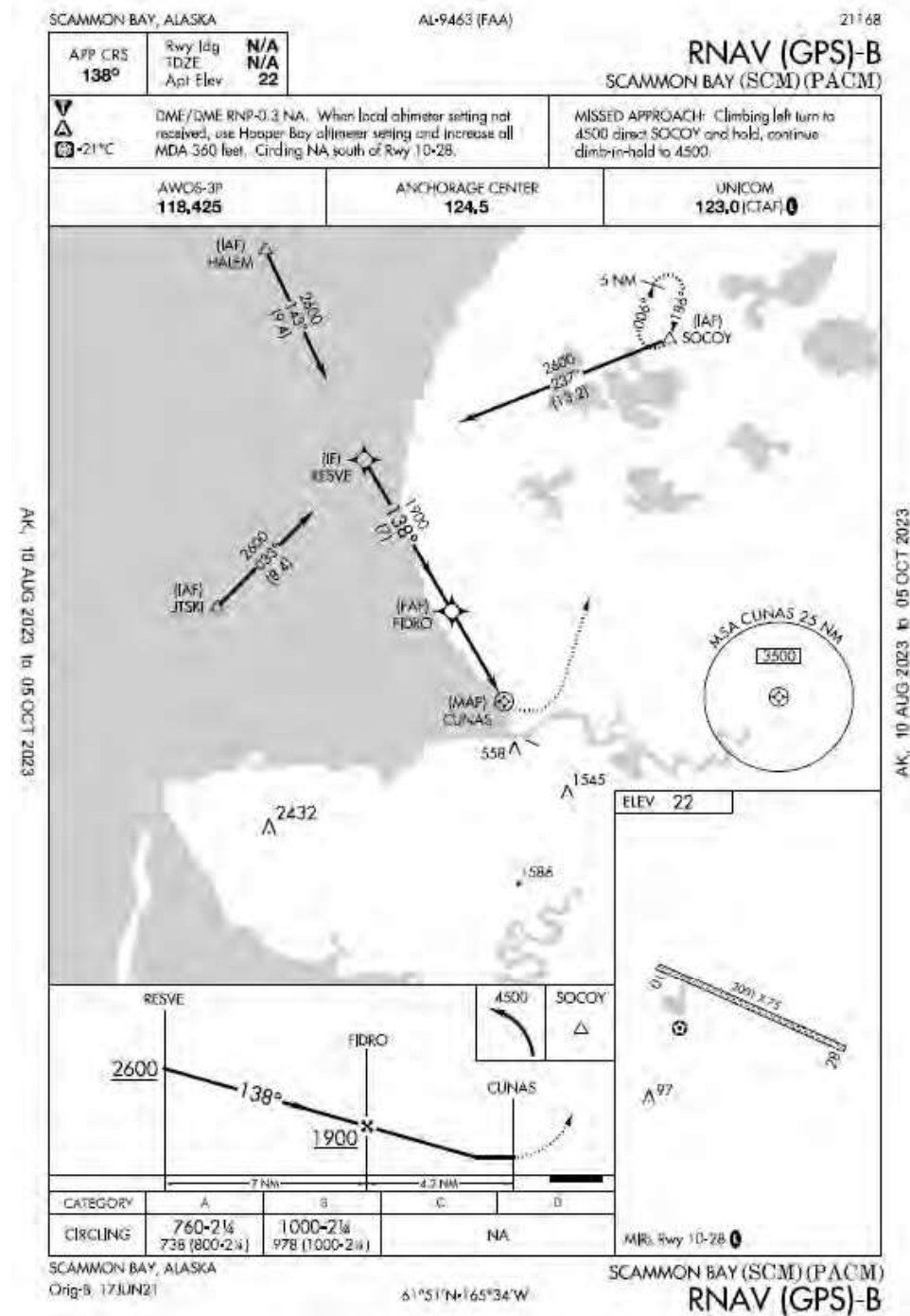


Figure 2-5 Instrument Approach RNAV (GPS)-B



- 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)

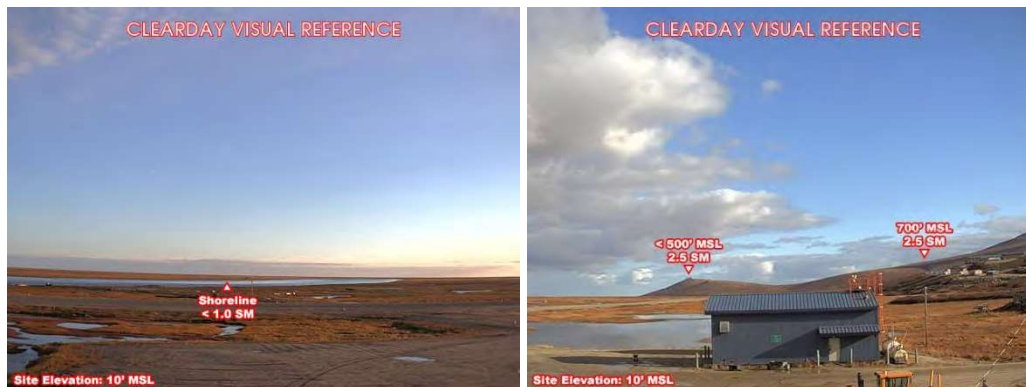
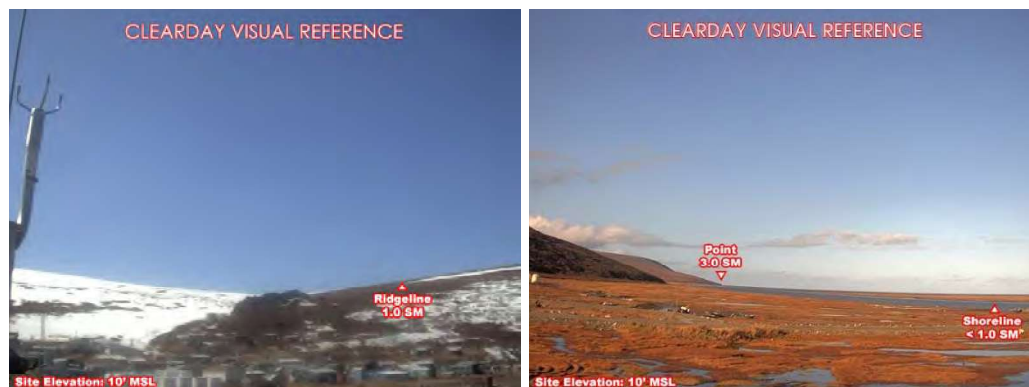


Figure 2-7 Southwest and West (right) Views from Scammon Bay (FAA, 2023a)



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 conditions²	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

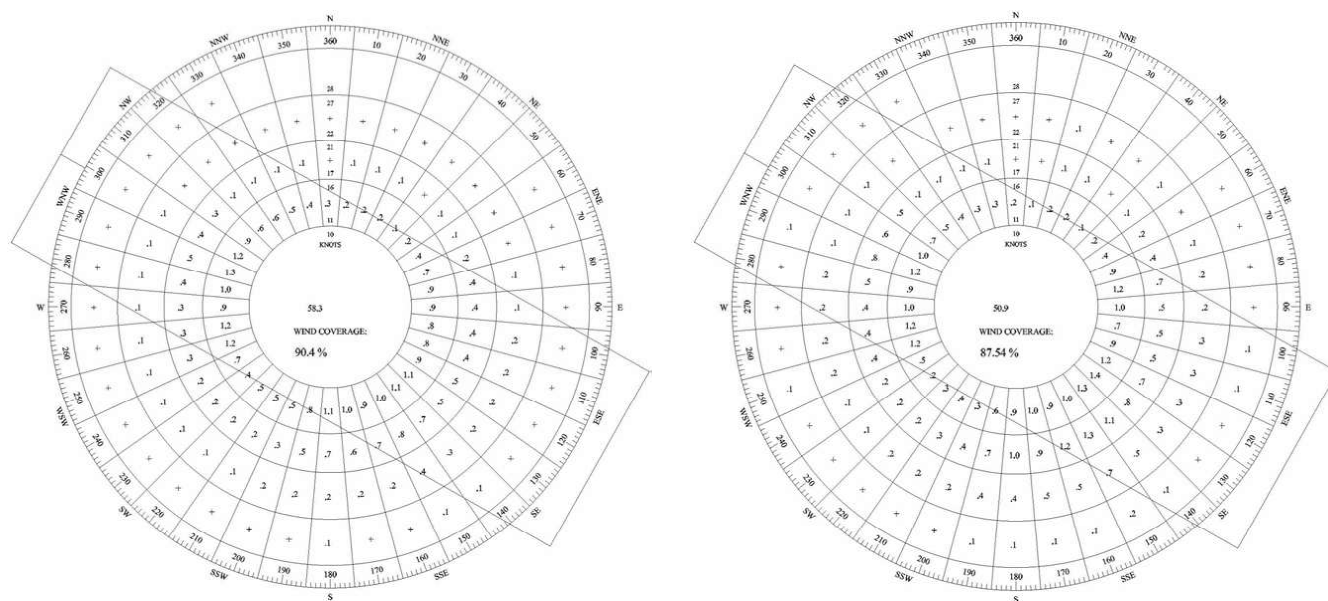
Precip. – Precipitation

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.

LEGEND

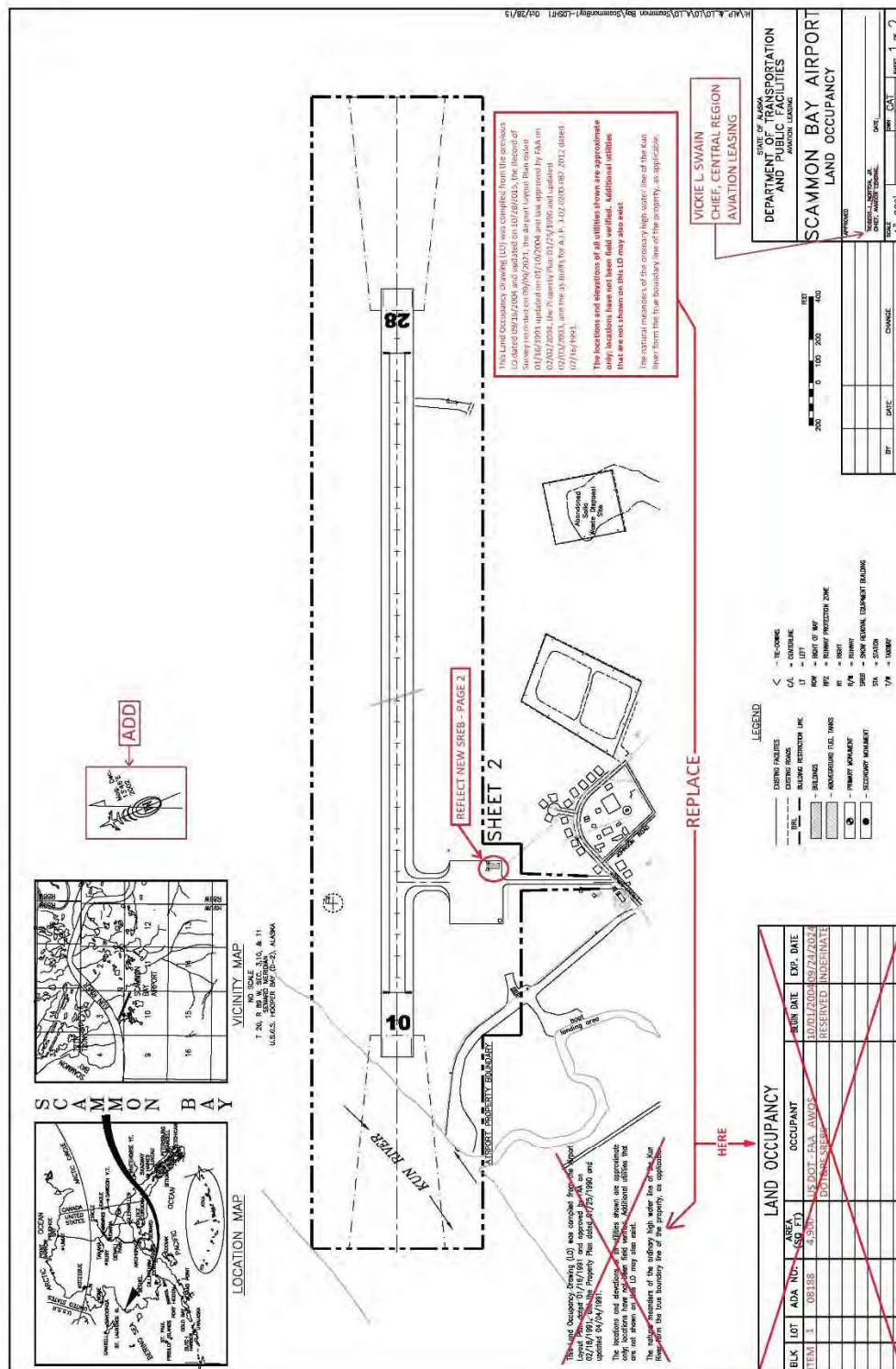
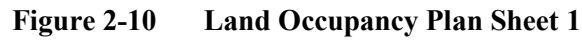
- EXISTING LANDMARK (SET BY OTHERS)
- EXISTING COMPROMISED (SET BY OTHERS)
- EASEMENT ON 2 1/2" L.P. (SET BY OTHERS)

TABLE

PARCEL	AREA	PERMIT / DATE	REMARKS	DATE ACQUIRED	ACQ. BY
1	87 Ac. 1/2	State of Alaska / 10/10/78	100% Submerged State	10/10/78	State of Alaska
2	100 Ac. 1/2	State of Alaska / 10/10/78	100% Submerged State	10/10/78	State of Alaska
3	100 Ac. 1/2	State of Alaska / 10/10/78	100% Submerged State	10/10/78	State of Alaska
4	100 Ac. 1/2	State of Alaska / 10/10/78	100% Submerged State	10/10/78	State of Alaska

VICINITY MAP

USGS AERIAL PHOTOGRAPH, JAN 01, 1978
 1:50,000 SCALE
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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

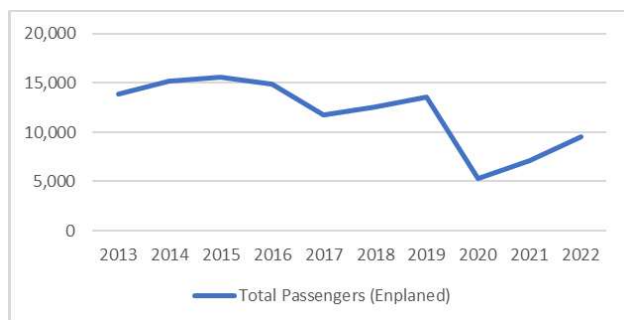
Source: USBTS, 2023.

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

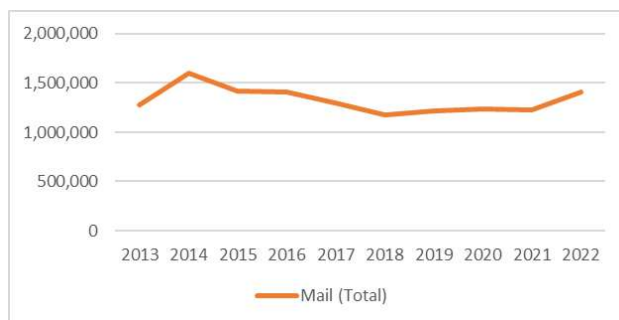
Source: USBTS, 2023.

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	<i><u>87,394</u></i>	<i><u>76,603</u></i>	<i><u>82,172</u></i>	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	<i><u>46,373</u></i>	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	

Bold, italics, underline – 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

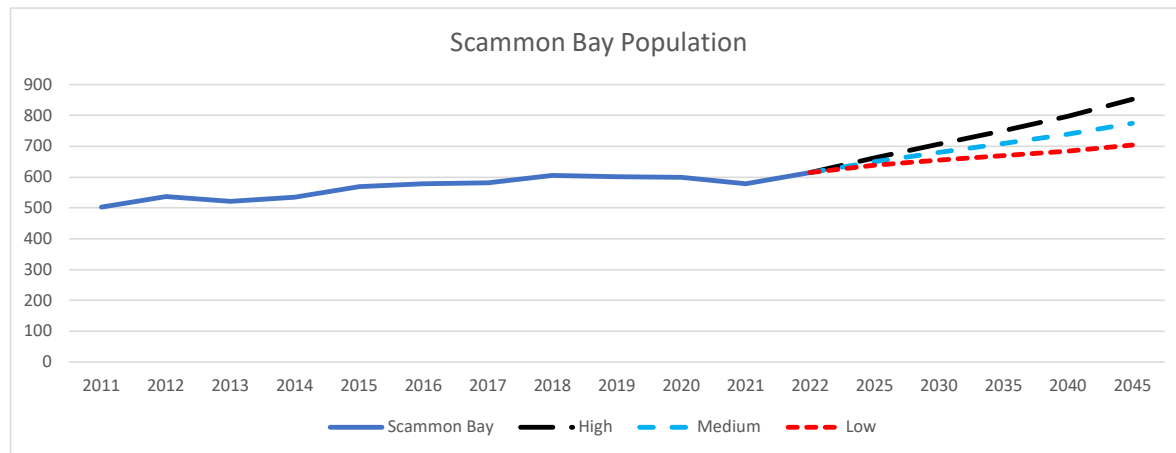
Table 3-9 Scammon Bay Population Estimates: High, Medium, Low

	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 statute-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 $\frac{3}{4}$ 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 + 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.

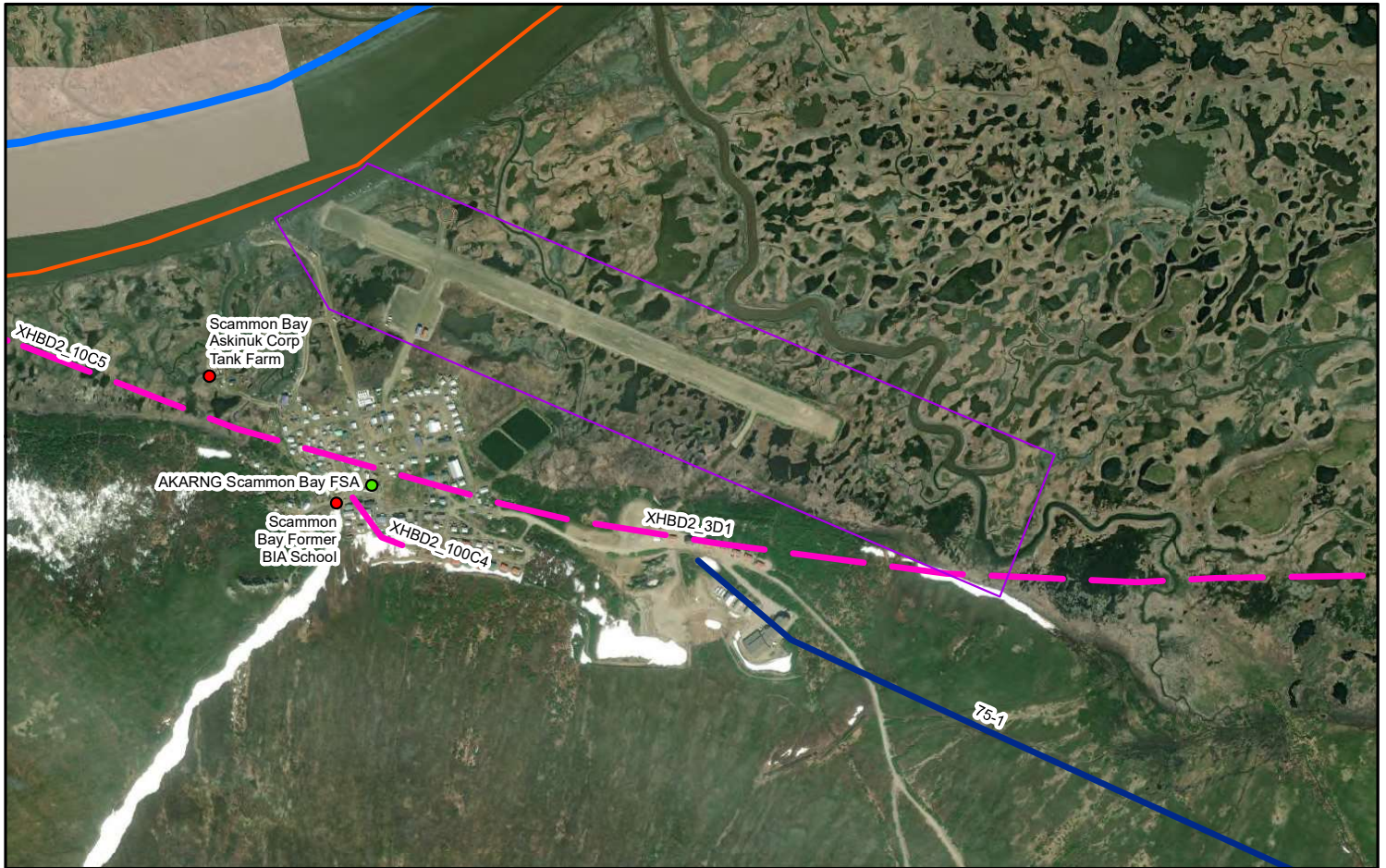
6.4 Cultural Resources

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.



N
0 0.1 0.2 Miles
1:10,758 (At original document size)

- 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.



 1:10,758 (At original document size)	Study Area Airport Boundary Easement - Polygon	Vegetation Map Wetland Emergent Wetland Forested/Shrub Wetland	Pond; Lake Riverine Upland	SCAMMON BAY AIRPORT PLANNING STUDY	
				STATE OF ALASKA Department of Transportation and Public Facilities 4111 Aviation Ave, Anchorage, Alaska 99516	
				November 2023	Figure 6-2: SCM Vegetation

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

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.

7 REFERENCES

- Alaska Department of Environmental Conservation (ADEC). 2023. Contaminated Sites Atlas. Accessed November 3, 2023, at <https://www.arcgis.com/apps/mapviewer/index.html?webmap=315240bfbaf84aa0b8272ad1cef3cad3>
- Alaska Department of Transportation and Public Facilities (ADOT&PF). 1991. Scammon Bay Airport Improvements. Environmental Assessment. Project No. 57981.
- City of Scammon Bay. 2013. Hazard Mitigation Plan. Prepared by City of Scammon Bay Hazard Mitigation Planning Team. Accessed October 23, 2023, at commerce.alaska.gov/dcra/admin/Download/GetFile/?documentUID=d00d3dab-701a-4d59-ba14-1b2f09e7882f&isPdf=true
- Division of Geological & Geophysical Surveys (DGGS). 2023a. Scammon Bay Storm 2004 October 18. Pictures. Accessed October 23, 2023, at <https://maps.dggs.alaska.gov/photodb/detail/17404>
- DGGS. 2023b. Scammon Bay Storm Merbok September 17, 2022, p02. Pictures. Accessed October 23, 2023, at <https://maps.dggs.alaska.gov/photodb/detail/23488>
- Department of Commerce, Community and Economic Development (DCCED). 1994. View from Hill. Accessed October 23, 2023, at <https://www.commerce.alaska.gov/dcra/admin/Photohttps://www.commerce.alaska.gov/dcra/admin/Photo>
- Department of Labor and Workforce Development (ADLWD). 2023. Alaska Population Projections. Accessed on November 3, 2023 at <https://live.laborstats.alaska.gov/article/alaska-population-projections>
- Federal Aviation Administration (FAA). 1983. AC 150/5060-5 - Airport Capacity and Delay. September 23, 1983. Accessed November 3, 2023 at: https://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5060_5.pdf
- FAA. 2005. AC 150/5325-4B - Runway Length Requirements for Airport Design. July 1, 2005. Accessed November 3, 2023 at: https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_150_5325-4B.pdf

FAA. 2022. AC 150/5300-13B – Airport Design. February 14, 2023. Accessed November 3, 2023 at:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13B-Airport-Design.pdf

FAA. 2023a. Alaska Aviation Weather Cameras: Scammon Bay. Accessed November 3, 2023, at
<https://weathercams.faa.gov/>

FAA. 2023b. Terminal Area Forecast (TAF). Accessed November 3, 2023, at <https://taf.faa.gov/>

Federal Emergency Management Agency (FEMA). 2023. Declared Disasters. Alaska. Accessed
December 27, 2023, at <https://www.fema.gov/locations/alaska>

Flagstad, L., M. A. Steer, T. Boucher, M. Aisu, and P. Lema. 2018. Wetlands across Alaska: Statewide
wetland map and assessment of rare wetland ecosystems. Alaska Natural Heritage Program, Alaska
Center for Conservation Science, University of Alaska Anchorage. 151 pages. Accessed November 1,
2023 from <https://accscatalog.uaa.alaska.edu/dataset/alaska-vegetation-and-wetland-composite>

Giefer, J., and S. Graziano. 2023. Catalog of waters important for spawning, rearing, or migration of
anadromous fishes – Interior Region, effective June 15, 2023, Alaska Department of Fish and Game,
Special Publication No. 23-02, Anchorage.

HDR. 2022a. Coastal Report - Scammon Bay Airport Improvements Feasibility Study. Prepared for the
Alaska Department of Transportation and Public Facilities, Central Region.

HDR. 2022b. Hydrology and Hydraulics Report - Scammon Bay Airport Improvements Feasibility Study.
Prepared for the Alaska Department of Transportation and Public Facilities, Central Region.

Huntington, H.P., M. Nelson, L.T. Quakenbush. 2017. Traditional knowledge regarding marine mammals
near Scammon Bay, Alaska. Final report to the Eskimo Walrus Commission, the Ice Seal Committee,
and the Bureau of Ocean Energy Management for contract #M13PC00015. 10pp Accessed November
1, 2023, at
[https://www.adfg.alaska.gov/static/research/programs/marinemammals/pdfs/boem_2019_79_M13PC
00015_ice_seal_tracking_appendices.pdf](https://www.adfg.alaska.gov/static/research/programs/marinemammals/pdfs/boem_2019_79_M13PC00015_ice_seal_tracking_appendices.pdf)

National Marine Fisheries Service (NMFS). 2023. Alaska Endangered Species and Critical Habitat
Mapper Web Application. Accessed on November 3, 2023, at

<https://www.fisheries.noaa.gov/resource/data/alaska-endangered-species-and-critical-habitat-mapper-web-application>

National Oceanic and Atmospheric Administration (NOAA). 2023. Storm Events Database. Accessed on October 23, 2023, at <https://www.ncdc.noaa.gov/stormevents/textsearch.jsp?q=Scammon+Bay+Flood>

U.S. Bureau of Transportation Statistics (USBTS). 2023. T-100 Domestic Market Data. Accessed on November 3, 2023, at <https://www.transtats.bts.gov/>

U.S. Fish and Wildlife Service (USFWS). 2023. IPaC Information for Planning and Consultation. Accessed November 3, 2023, at <https://ipac.ecosphere.fws.gov/>.