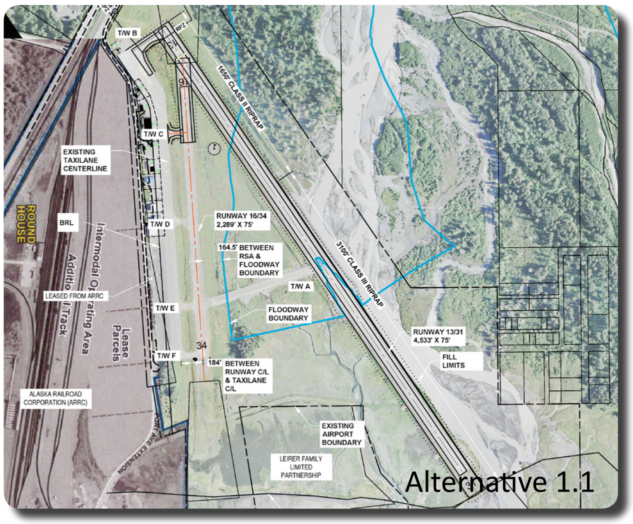
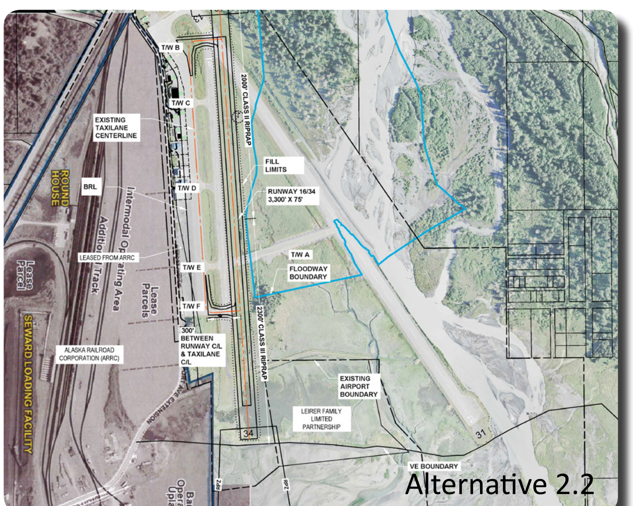
Seward Airport Improvements
Scoping Report

AKSAS No. 54857

June 2017





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1 INTRODUCTION

The State of Alaska Department of Transportation and Public Facilities (DOT&PF) has retained PDC Engineers (PDC) to lead in the design, environmental, and planning studies for improvements to the Seward Airport. As part of the proposed project, Solstice Alaska Consulting, Inc. is providing public involvement, permitting, and biological assessments. Quantum Spatial, Inc. provided mapping and photogrammetry services. Hydraulic Mapping and Modeling is providing hydrologic and hydraulic modeling, and Shannon & Wilson, Inc. is providing geotechnical investigations.

Seward, Alaska is located on the Kenai Peninsula at the north end of Resurrection Bay, approximately 75 air miles or 125 highway miles southwest of Anchorage. The State owns and operates the Seward Airport which includes a paved main runway (13/31), a paved crosswind runway (16/34), multiple taxiways, and two aprons.

Most of the Seward Airport is located within the floodplain of the Resurrection River Delta. The airport has flooded many times over the years. Both the main runway and Taxiway A have suffered regular damage from these events. Temporary repairs and construction of dikes and installation of culverts have been completed in an effort to keep the airport operational.

1.1 Scope

The scoping phase of the project included:

- Review of historical information
- Coordination with the community
- Field reconnaissance
- Collection and evaluation of data that would potentially impact airport development (land status, wind data, aircraft operations, terrain obstructions, topography, and environmental)
- Detailed initial Geotechnical evaluation
- Detailed hydrologic studies
- Communication with DOT&PF functional groups to evaluate design elements
- Development and evaluation of airport alternatives
- Identification of data gaps

This scoping summary report documents this effort and recommends that two alternatives, Alternatives 1.1 and 2.2, be evaluated further during the environmental process.

1.2 Project History

The Seward Airport Improvement project has been in the planning stages since the 2008 Airport Master Plan was developed. An Environmental Assessment was conducted as part of this plan and a finding of no significant impact (FONSI) was obtained in 2008 for the recommended improvements. Since that assessment, the course of the Resurrection River changed and the main channel is now directed toward the main runway (13/31). As a result, the proposed project selected under the 2008 EA is no longer valid. This project was initiated in 2014.

1.3 Purpose and Need

The Seward Airport Improvements project has two primary purposes. The first is to develop engineering solutions that will protect airport facilities from further damage caused by recurrent flooding from the Resurrection River. The second purpose is to correct deficiencies that exist, based on the airport's function and FAA design standards.

The Seward Airport is located within the floodplain of the Resurrection River; portions of the airport are within the defined floodway. The main runway (RW 13/31) has been overtopped 18 times since 2011, resulting in damage to all the airport facilities. Erosion from the river and regular flood damage require a continued maintenance effort to keep the runway usable. The purpose of the Seward Airport Improvements project is to provide a reliable working airport that satisfies current FAA design standards for an Aircraft Design Group II (ADG II) facility and the state's requirements for a Community Class Airport. These improvements should meet the near term aviation demands as well as plan for future demand. Specifically, the airport needs to:

- Maintain a minimum runway length of 3,300 feet,(consistent with Community Class Airport standards) which will accommodate current and near term aircraft, including medevac operations
- Meet the runway width and taxiway dimensional standards of ADG II
- Construct flood protection to prevent erosion damage from the 100-year flood
- Provide a minimum of 95% wind coverage for the ADG II aircraft
- Include construction of a runway with sufficient bearing capacity to allow for occasional operations by larger aircraft such as Beech 1900, Dash 8, and small charter type business jets
- Provide reliable airport lighting for night operations
- Mitigate approach obstructions and incompatible Runway Protection Zone (RPZ) uses to the extent practicable
- Accommodate the need for aircraft owners to change out from floats to wheels, if practicable
- Ensure the airport has sufficient service roads

1.4 Project Team

Table 1 - Project Team

CONTRACTING AGENCY		
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2 EXISTING CONDITIONS

2.1 Airport Facilities

The State of Alaska owns and operates the Seward Airport, which includes a paved main runway (RW 13/31), a paved crosswind runway (RW 16/34), multiple taxiways, and two aprons. Runway 13/31 is 4,249 ft x 100 ft and Runway 16/34 is 2,289 ft x 75 ft. The Seward Airport primarily serves the City of Seward, and residents of the area between Seward and Moose Pass. Local residents use the airport for travel to Anchorage and Prince William Sound. Tour operators use the airport as a base for sightseeing tours of Kenai Fjords National Park via airplane and helicopter. The number of operations at the airport is higher in the summer than in the winter.

Most of the Seward Airport is located within the floodplain of the Resurrection River Delta with about half of Runway 13/31 lying with the floodway. The frequency with which Runway 13/31 has been overtopped by the Resurrection River has substantially increased in recent years. These instances were limited initially to the fall, but they are now occurring in the summer as well (June to November). Recent changes in channel morphology have rendered the existing riprap along the eastern side of the runway inadequate. Without additional protection, erosion and overtopping of the runway will continue; DOT&PF will keep pouring maintenance funds into repairs.

Testing of the main runway embankment has shown an insufficient bearing capacity to support large aircraft. Frequent flooding is thought to have contributed to a weakened embankment under the pavement. As a result, landings by larger aircraft have been restricted.

2.2 Community Characteristics

Much of the information in Sections 2.2 – 2.5 is extracted from the 2008 Airport Master Plan, with updates as known.

Seward is located on Resurrection Bay on the east coast of the Kenai Peninsula. It lies at the foot of Mount Marathon and is the gateway to the Kenai Fjords National Park. Seward is connected by highway to Anchorage, 125 miles to the north. Seward is a major transit site for the Alaska Railroad (ARRC). A 900 foot deep port located at the north end of Resurrection Bay serves cruise ships, cargo barges, and ocean freighters from Seattle and overseas. The ARRC is presently considering expansion of the facilities to serve projected demand.

The Seward city limits cover 14.4 square miles of land and 7.1 square miles of water. Seward experiences a maritime climate and has a year round ice-free port. Seward is primarily a non-Native community, although the Qutekcak Tribe is very active within the community.[1]

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[1] "Community Database Online". *State of Alaska, Division of Community and Regional Affairs*. Web. 23 January 2017.

2.3 Land Use and Land Ownership

The Seward Airport is located on 302 acres next to the Resurrection River, at the head of Resurrection Bay. Other land uses in the area include a landfill/transfer station approximately one and a half miles northwest of the west end of the airport, and a municipal sewage lagoon approximately three miles south of the airport. The airport is located east of the Seward Highway, and is about two miles northeast of downtown Seward. The airport is owned and operated by DOT&PF. The original deed for the airport property was obtained from the Alaska Railroad by the State of Alaska in 1907.

The largest landowner adjacent to the airport is the Alaska Railroad Corporation (ARRC) which owns all of the property on the west side of the airport. The Civil Air Patrol (CAP) owns a large parcel of land to the northeast of the airport, but most of this parcel lies within the Resurrection River floodplain making future development unlikely. The other parcels of land adjacent to the airport are relatively small and are owned either by individuals or the City of Seward. A privately owned parcel along the south boundary of the airport is completely surrounded by the airport, with the only land access to this parcel across airport property.

2.4 Airport Vicinity Transportation

2.4.1 Surface Access to the Airport

The Seward Airport is served by a single access road. The road begins at the Seward Highway near the southernmost Resurrection River Bridge and runs southwest alongside the train tracks. The road then turns south and parallels the west side of the apron and the lease lots. The access road is paved, and is approximately 24 feet wide and 4,000 feet long. Because the access road crosses the Alaska Railroad tracks at the Seward Highway, it can be blocked when trains are inbound, outbound or switching. According to the 2008 Master Plan Study, community members report that the current airport entrance is dangerous due to limited visibility when entering the Seward Highway. There is strong support to find a better solution.

There is limited space on the lease lots for parking, so tenants and tourists requiring access to the buildings on the lease lots, generally park on the apron in the vicinity of the buildings or along the shoulder of the airport access road. It is the tenant’s responsibility to provide space for parking on their lease lots. Access to these buildings is gained by driving along the apron on the airfield side of the lease lots. The 2008 AMP reported that this causes occasional conflicts between vehicles, aircraft, and pedestrians. This conflict was most evident during the summer when tour helicopters were loading and unloading passengers at the north end of the apron. Updated interviews with airport users did not reveal continued concern, potentially due to reduced air traffic since the 2008 study was done.

2.4.2 Available Utilities

Communications - Interior Telephone (TelAlaska) and AT&T Alascom provide local telephone service; GCI and Interior Telephone provide long distance service. There are three different Internet providers. Seward has six radio stations along with three television stations. GCI Cable provides cable television service. There is one weekly newspaper in Seward, The Seward Phoenix Log.

Electricity - Electricity is provided by the Seward Electric System, which purchases power from Chugach Electric. Seward Electric System also owns high capacity generators to provide backup power to the community. Electricity is available to all lease lots on the airport.

Wastewater - A city-managed public sewage system serves the majority of Seward. It carries wastewater to a treatment lagoon on Lowell Point, approximately three and a half miles south of the Seward Airport. A small portion of Seward households utilize on-site septic tanks. No public wastewater service is available on the airport.

Water - Almost all homes in Seward have indoor plumbing, with only a small percentage lacking complete plumbing. Nearly all homes in Seward utilize the public water system, with a low percent of homes using an individual well. Water is supplied by city wells, where it is chlorinated before being distributed to Seward. No city drinking water is available at the airport, but water is available at the nearby coal facility offices and along the Seward Highway.

Solid Waste Generation and Disposal - Solid waste is collected by the Seward Disposal Service and taken to the Seward Transfer Facility, which is located on Hemlock Street, 1.5 miles northwest of the Seward Airport. From the Seward Transfer Facility, waste is hauled to the Central Peninsula Baling Facility in Soldotna.

Fuel - The primary fuel supplier in Seward is Shoreside Petroleum, which has six fuel tanks with a capacity of 120,000 gallons each. The City of Seward has an additional 40,000 gallons of fuel capacity, and there are 68,000 gallons of capacity available elsewhere in the community. A local fixed-base operator, Seward Air, maintains 5,000 gallons of Jet A and 5,000 gallons of 100LL fuel for purchase at the airport.

2.5 Environmental Data

2.5.1 Topography, Geology, and Soil

Seward is located at the northern end of Resurrection Bay on the southeast coast of the Kenai Peninsula. This Bay is an extension of an eroded glacial valley in the Kenai Mountains, and is a deep fjord extending north from the Gulf of Alaska. Rising steeply above the bay, the surrounding Kenai Mountains climb to altitudes of nearly 5,000 feet. The waters and shores of the bay are ice-free year round. The City of Seward is particularly susceptible to earthquakes, tsunamis, and stream flooding, which may be aggravated by heavy rains, melt runoff, heightened tidal action, and severe winds. During winter months, deep snow and avalanches occasionally hamper transportation and emergency response time in the community.

2.5.2 Hydrology

The Seward Airport was constructed in the Resurrection River floodplain, on the delta at the river's mouth. The river is a wide, glacial fed, braided river with low banks. Over time the river channel has moved back and forth across the floodplain, consistent with the behavior of a braided river. Wetland areas have developed where surface drainage is restricted, or in areas subject to tidal inundation. With depths of one to two feet, the groundwater table is very shallow in places. The airport has flooded 18 times since 2011; the frequency and severity of flooding has been accelerating. The result is more frequent and intense flooding events. Both the main runway and Taxiway A have suffered regular damage from these events.

2.5.3 Climate Data

Seward has a maritime subpolar, or a subarctic climate, which is characterized by long, cold winters and short, cool to mild summers. Seward experiences moderate temperatures for Alaska and, due to its location along the Gulf of Alaska, high levels of precipitation. Average winter temperatures range from 17° to 38° F; summer average temperatures range from 49° to 63° F. Annual precipitation averages 66 inches of rain and 80 inches of snowfall.

3 AVIATION ACTIVITY AND FORECAST

3.1 Forecast Elements

Forecasts of future levels of aviation activity are the basis for making decisions in airport planning and future development. A comprehensive forecast includes elements of socioeconomics, demographics, geography, and external factors. Recent interest in Seward by the fishing and marine industries has sparked anticipation of growing industrial development in the community. This forecast update for Seward Airport was finalized in July 2015. Baseline data for the forecast was 2013.

The FAA is providing the majority of the funding for the improvements, as a result, FAA regulations and guidance are used as the basis of this report. The methodology used in this forecast is based on the process recommended in FAA AC 150/5070-6B, Airport Master Plans, and in the supplemental FAA publication, Forecasting Aviation Activity by Airport. These documents provide national guidance for the development of airport master plans, and have been used since enactment of the Airport and Airway Development Act of 1970.

The level and type of aviation activity anticipated at an airport, as well as the nature of the planning to be done, determine the factors to be forecasted. Generally, the most important activities for airfield planning are aircraft operations and the fleet mix. These factors aid in the determination of the design aircraft, which in turn defines the runway and taxiway requirements.

Practical considerations dictate the level of detail and effort that should go into an airport planning forecast. Air traffic activity at Seward comprises single and twin-engine GA aircraft, medevac aircraft, military aircraft, and helicopters. Because this project centers on runway improvements, the forecast for Seward Airport (SWD) will focus on:

- Aircraft operations – an aircraft landing or takeoff; one flight to and from the same location counts as two operations.
- Based aircraft – the total number of active general aviation aircraft that use an airport as a home base.
- Fleet mix – describes the makeup of the different aircraft in use at an airport.

3.2 Previous Airport Forecasts

Relevant forecasts of aviation activity at Seward are summarized below.

3.2.1 Seward Airport Master Plan (2008)

In 2008, the DOT&PF updated the Seward Airport Master Plan. This update forecasted aircraft operations and passenger enplanements as summarized in the following table. An annual growth rate of 1.2% was used to forecast future operations, enplanements, and cargo.

An enplanement is defined as a passenger boarding.

Table 2 - 2008 Seward Airport Master Plan Aviation Forecast, Moderate Growth Scenario

	2003 (Base)	2008	2013	2018	2023
Enplanements	3,746	3,976	4,221	4,480	4,755
Commercial Operations	2,912	3,091	3,281	3,483	3,697
GA Operations	2,475	2,627	2,789	2,960	3,142
Military Operations	75	—	—	—	—
Cargo (lbs)	4,000	4,416	4,876	5,383	5,944

3.2.2 Alaska Aviation System Plan (2008)

The Alaska Aviation System Plan (AASP) is a component of DOT&PF's Statewide Transportation Plan. Most recently updated in 2008, the AASP contains forecasts of enplanements, cargo, operations, and based aircraft for 2015, 2020, and 2030. The AASP has a complex forecasting methodology that combines historical data with population projections, expendable income, and other economic considerations, as well as gradual transformation in the aircraft fleet. The equations for forecasting enplanements, cargo, and operations differ; growth factors are different for each period. The forecast for the 2008 update was completed and published in 2011 using 2008 as the base year. Details of the methodology are documented in the AASP.

Table 3 - Alaska Aviation System Plan Forecast, Seward Airport

Seward	2008 (Base)	2015	2020	2030
Enplanements	22	23	25	29
Cargo	None	None	None	None
Critical Aircraft	Cessna 185			
Aircraft Operations				
Commercial	4,500	4,136	4,318	4,576
GA	6,000	5,932	6,211	7,133
Military	10	10	10	10
Total Operations	**10,510**	**10,178**	**10,539**	**11,719**
Based Aircraft				
Single engine	28	29	29	31
Multi-engine	0	0	0	0
Helicopter	0	0	0	0

3.2.3 FAA Terminal Area Forecast

The FAA Terminal Area Forecast (TAF) is the official FAA forecast for aviation activity for U.S. airports. The TAF for Seward Airport is summarized in Table 4 - FAA Terminal Area Forecast (2013) Seward Airport. The TAF includes passenger enplanements, aircraft operations, and based aircraft. A local operation is performed by a based aircraft, whereas an itinerant operation is performed by an aircraft not based at the airport; another term often used for itinerant operations is transient operations.

Table 4 - FAA Terminal Area Forecast (2013) Seward Airport

Passenger Enplanements			Itinerant Aircraft Operations				Local GA Ops	Total Ops
Air Carrier	Commuter/ Air Taxi	Total	Air Carrier	Commuter/ Air Taxi	GA	Military		
0	9	9	0	4,500	4,000	10	2,000	10,510

The U.S. Department of Transportation (DOT) is the main source of airport statistics. U.S. scheduled and non-scheduled certified air carriers, commuter air carriers, and small certified air carriers submit data to DOT on Form 41 Schedule T-100 (simply referred to as T-100 data). The unusually low number of commuter/air taxi enplanements, compared to the number of operations, is likely due to the lack of scheduled commercial service to SWD. This indicates enplanements are most likely not recorded in the T-100 database, which could account for the low number.

3.2.4 National Plan of Integrated Airport Systems (NPIAS)

The NPIAS presents a five-year forecast of enplaned passengers and based aircraft. The current NPIAS forecast for Seward (for the years 2013-2017, using 2011 as the base year) is presented in Table 5.

Table 5 - NPIAS Forecast Year 2017

Enplanements	8
Based Aircraft	25

3.3 Operations

The FAA requires master plan forecasts to incorporate the number of aircraft operations for various categories of aircraft. Passenger enplanement, cargo, mail, and freight data are also recommended. The governing Advisory Circular (AC) specifies that population, employment rates, and socio-economic factors be included, as any of these can also affect the forecast.

Historical air traffic data for Seward were collected from FAA's Airport Master Record Form 5010, the FAA TAF, the NPIAS, the USDOT Bureau of Transportation Statistics, the AASP, and the 2008 Airport Master Plan. Data also came from interviews with airport users, potential airport users, medevac providers, and Seward-based industry. Air traffic operations at Seward Airport are not recorded on site because there is no air traffic control tower. Because of this, GA activity is likely underreported. Also, local residents have reported that after the recent airport flooding events, aviation activity has slowed. The magnitude of this would be difficult to define given the airport is not towered, and there are no reporting requirements. Aviation activity at Seward is predominantly unscheduled GA and air taxi flights, with consistent medevac and occasional military use.

There are two primary sources of aircraft operations for Seward Airport: the FAA's Form 5010, *Airport Master Record*, and the FAA TAF. These data are presented in the table below. The FAA TAF for SWD dating back to 1980 has not changed (see Appendix A). The list has reported 10,510 operations for each year, broken down as shown in Table 6.

Table 6 - Aircraft Operations

Source	Air Carrier	Air Taxi	GA Local	GA Itinerant	Military
Form 5010	0	4,500	2,000	4,000	10
TAF	0	4,500	2,000	4,000	10

3.3.1 Passengers

Passenger traffic at Seward Airport (SWD) has remained low over the past decade. The T-100 database shows fewer than 30 passengers per year since 2004 (see Table 7 – Historic SWD Commuter Passenger Enplanements, 1990-2013).

It should be noted that scheduled passenger service was discontinued in 2002.

Table 7 – Historic SWD Commuter Passenger Enplanements, 1990-2013

Year	Passengers	Year	Passengers
1990	2218	2002	15
1991	598	2003	0
1992	1073	2004	20
1993	127	2005	1
1994	1073	2006	7
1995	587	2007	26
1996	846	2008	22
1997	1373	2009	18
1998	1331	2010	9
1999	583	2011	22
2000	512	2012	8
2001	338	2013	0

3.3.2 Freight and Mail

The USDOT T-100 data show no history of freight or mail passing through SWD. Mail and cargo are most frequently transported via highway or rail. With the proposed expansion of the shipyard by Vigor Alaska, air cargo may increase in the future. See the Economic Activity discussion below.

3.3.3 Based Aircraft

The FAA Airport Master Record Form 5010 lists 25 single-engine aircraft based at SWD. This number concurs with previous forecasting efforts and interviews with airport users.

3.4 Current Aircraft Fleet Mix

Table 8 - Current (2013) Fleet Mix Using Seward Airport lists the types and Aircraft Design Group (ADG) of aircraft that landed at SWD at least once during the period from 2007 through 2013.

Table 8 - Current (2013) Fleet Mix Using Seward Airport

Operator	Aircraft	ADG	Use
LifeMed	A-Star helicopter King Air 200	N/A II	Medevac
LifeFlight	King Air 200	II	Medevac
Guardian	King Air 200	II	Medevac
Scenic Mountain Air	Cessna 172	I	Flight seeing/air taxi
Seward Air	Super Cub PA-18	I	Personal
Private	Cessna 172 Super Cub PA-18	I I	Personal
Private	Cessna 170	I	Personal
Grant Aviation	B200	II	Air Taxi/Charter
Homer Air	Cessna C206/207/209/210 Stationair	I	Air Taxi/Charter
Smokey Bay Air	Cessna C206/207/209/210 Stationair	I	Air Taxi/Charter
Iliamna Air Taxi	Pilatus PC-12	II	Air Taxi/Charter
Island Air Service	Cherokee 6	I	Air Taxi/Charter
Alaska Central Express	Beech 1900	II	Air Taxi/Charter
Era Aviation	Beech 1900	II	Air Taxi/Charter
Frontier Flying Service	Beech 1900	II	Air Taxi/Charter
Warbelow	Cessna 172	I	Air Taxi/Charter
Wright Air Service	Cessna 208 Caravan	II	Air Taxi/Charter

US DOT T-100 data were acquired and reviewed (see Appendix A). No flights for Seward were listed in the 2013 data. This is potentially due to recurrent runway flooding, and subsequent weight restrictions of 12,500 lbs, that was placed on the main runway.

The Kenai Peninsula Aviation Superintendent provided a list of large aircraft, either meeting or exceeding the weight restrictions, which requested permission to land at Seward in 2013.

- Lear 35 (ADG C-I): 11 requests
- King Air 200 (ADG B-II): 16 requests
- Gulfstream 5 (ADG C-III): 4 requests
- DC-6 (ADG B-III): As needed

The King Air 200 maximum landing and takeoff weight is 12,500 lbs., so this aircraft was unaffected by the weight restrictions.

In addition to the above fleet mix, the U.S. Coast Guard has historically used SWD for search and rescue activities, and also for pilot training for short field landings with the C-130 (an ADG IV aircraft). Helicopters used include the H-60 and H-65.

3.5 Socioeconomic Activity

An analysis of socioeconomic activity is usually helpful in developing a forecast of aviation demand. Projected increases in population or economic activity can lead to increased use of an airport.

The following section highlights major factors anticipated to contribute to socioeconomic growth in Seward. These include:

- Population forecasts
- Possible relocation of Coastal Villages Region Fund (CVRF) Community Development Quota (CDQ) Fleet to Seward
- Use of Seward as the homeport for *R/V Sikuliaq*, a marine research vessel
- Vigor Alaska's purchase and planned expansion of Seward Drydock
- Tourism

3.5.1 Population

The population of Seward has grown steadily over the past 14 years to a current population of 2,754 (see Figure 1). The compound annual growth rate over this time period is 1.23%. This is higher than the Alaska Department of Labor and Workforce Development's projected growth rate of 0.5% for the Kenai Peninsula Borough as a whole (Alaska Department of Labor and Workforce Development, 2014).

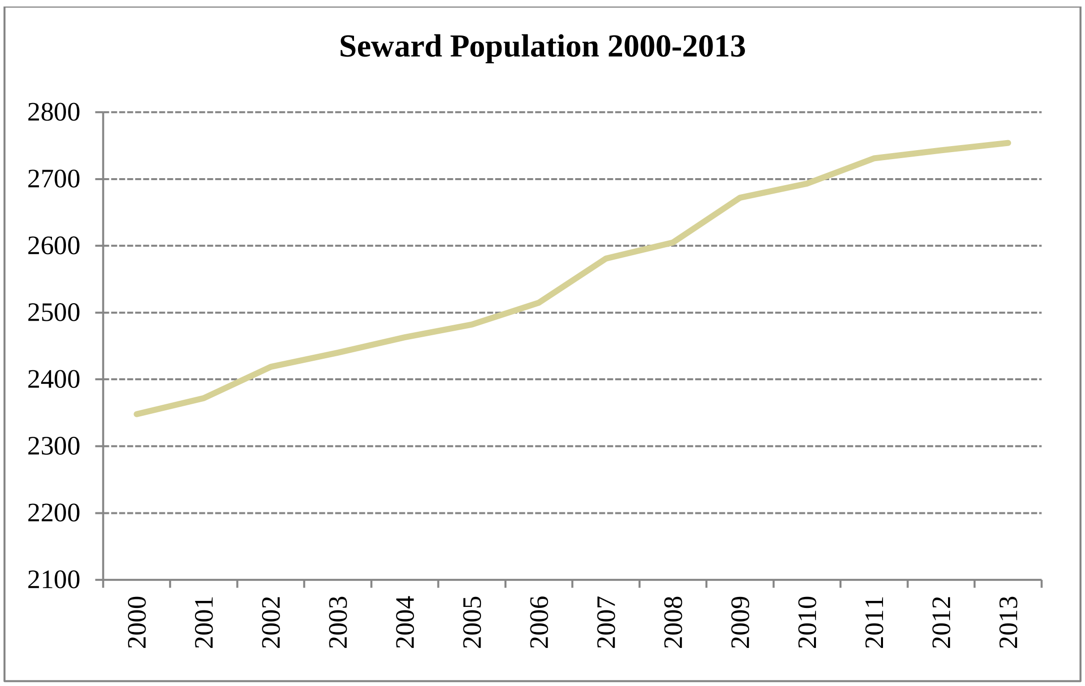

Figure 1 - Historic Seward Population, 2000-2013

3.5.2 Coastal Villages Region Fund CDQ Fleet

The CVRF represents 20 western Alaska communities in the CDQ fishery. The CDQ's purpose is to:

- Provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area
- Support economic development in western Alaska
- Alleviate poverty and provide economic and social benefits for residents of western Alaska
- Achieve sustainable and diversified local economies in western Alaska

The City of Seward has been actively trying to homeport the CDQ fleet in Seward rather than in Seattle. The CVRF has partnered with Seward to develop the Seward Marine Industrial Center (SMIC) support facilities. The SMIC will increase the available moorage, warehousing space, and upland areas to accommodate the CDQ fleet.

If the CVRF decides to homeport in Seward, the airport could see increased activity during spring deployment of the CDQ fleet when crews return to Seward. Based on the number of ships in the CDQ fleet, the number of potential crew members, and an assumed percentage of commuters that might fly into/out of Seward, this could result in an increase of approximately 500 enplanements twice a year.

3.5.3 *R/V Sikuliaq*

The City of Seward reported that the SMIC is the homeport for the 260-foot *R/V Sikuliaq*. This Alaska Region Research Vessel, commissioned in March 2014, is one of the most advanced university research vessels in the world. The *Sikuliaq* is owned by the National Science Foundation (NSF) and operated by the University of Alaska Fairbanks (UAF) as a part of the University-National Oceanographic Laboratory System's academic research fleet. The *Sikuliaq* is the first vessel in the U.S. academic research fleet capable of breaking ice up to 2.5 feet thick, making it uniquely equipped for polar and sub-polar research.

According to the City of Seward, an increase in aircraft operations between Anchorage and Seward could occur to equip, supply, and man this vessel for its voyages.

3.5.4 Vigor Alaska

In early 2014, Vigor Alaska announced the purchase of Seward Ship's Drydock. According to the press release, "the purchase will bring the strength of Vigor's physical, financial and human capital to bear on the yard, which will empower the yard to land more projects and larger-scale projects, translating to more work and sustainable employment for Alaska residents. In addition, Vigor will leverage its existing strong public/private partnerships in Alaska to maximize opportunities for the Seward yard." See Appendix A for the full article.

Vigor Alaska has provided a letter of support for airport rehabilitation and improvements, stating that "Shipyards rely on timely and affordable transportation and logistics to be competitive in today's economics." Further, the letter says that Vigor's operations depend on specialized production personnel who travel between their six other shipyards, as well as an array of support contractors, vendor technicians, and inspectors. Time is money. Vigor indicates the five-hour round-trip drive from Anchorage is problematic and poses dangerous winter driving conditions as well as closures due to avalanche. (See Appendix A for copy of the Vigor letter of support, dated January 2015).

It is conceivable that this industry buildup would increase demand for more frequent chartered air service, or even scheduled service between Seward and Anchorage. The aircraft type that may be chartered would depend upon whether the charter was to be cargo or passengers, and the number of passengers.

3.5.5 Tourism

Tourism is a major component of Seward's economy. Cruise ships, the railroad, and personal vehicles all bring tourists to the community. Attractions include Kenai Fjords National Park, the Alaska Sealife Center, the Mount Marathon Race, and Exit Glacier. Tourist activities include flightseeing, sportfishing, hiking, wildlife cruises, and sled dog demonstrations.

Seven main cruise lines served Seward in 2015: Holland America, Norwegian, Silver Sea, Celebrity, Regent, Crystal, and Royal Caribbean. Cruise ships in port can nearly double the population of the community. Many cruisers embark or disembark in Seward, with connections to/from Anchorage, Denali, and Fairbanks via buses or the Alaska Railroad. The number of scheduled dockings is up from 53 in 2014 to 63 in 2015, with an increase in passenger capacity from 67,912 to 91,230. The 34% increase in passengers appears to come not only from the 10 additional dockings, but also through a shift toward larger ships.

Flightseeing activities generally consist of small fixed-wing aircraft tours of the surrounding mountains, glaciers, and ocean. Typical aircraft are Cessna 172 or similar. The increase in passengers could cause an increase in the number of tourism-related flights.

3.5.6 Alaska Railroad (ARRC) Facility Improvements

The ARRC is planning a substantial investment and improvements in the port and rail facilities adjacent to the airport. During project coordination meetings, ARRC staff indicated that if the airport had regularly scheduled flights, ARRC would prefer to have its crews and management teams that occasionally commute to/from Seward fly versus traveling by rail or highway. Travel time and safety were the primary reasons cited. The specific number of enplanements this would add is undetermined.

3.5.7 Gas Line Construction

Seward experienced significant activity during the construction of the Trans-Alaska Pipeline in the 1970s. Most of the pipe was shipped through the port of Seward. During a project co-ordination meeting, ARRC staff predicted that if a new gas pipeline were constructed through Alaska, activity through the combined port/rail terminal would likely increase. This would also likely increase activity at the Seward Airport. This construction impact would be transitory. Short-term effects such as this normally do not drive long-term investment in airport facilities, especially if other (albeit less efficient) modes of transportation can meet the demand.

3.5.8 Other Oil & Gas Related Activity

Seward's ice-free deep sea port and shipyard capabilities, combined with gas and oil exploration and potential development in the Outer Continental Shelf, make Seward a desirable port for use by oil companies such as Shell to maintain and store marine vessels. Like Vigor Alaska and the ARRC, Shell Oil has indicated air travel demand could increase with its presence. "An upgrade to the existing airport would permit Shell to factor charter air transportation of material and personnel more aggressively than in the past to support our current operations while introducing a strong planning factor for future operations." (See Appendix A for Shell Oil letter of support.)

3.5.9 Medevac

The term "medevac" is an abbreviation for "medical evacuation." This and other terms referring to a type of medical emergency response (e.g., "helicopter emergency medical service" and "air ambulance") are used interchangeably in the United States. The value of air access to remote locations, or in the event of an emergency, is not generally recognized until it occurs. It is difficult to place an economic value on such capabilities. Often, the primary means of reaching a community immediately after a major act of nature such as a flood, earthquake, wildfire, or landslide is via air transport.

Both fixed wing aircraft and rotary wing aircraft (helicopters) are used in medical emergency response situations. Patients are flown by fixed wing aircraft for many different reasons ranging from the transfer of stable patients to critical medical operations. The fixed wing environment differs from the rotary wing environment primarily because fixed wing aircraft travel farther, faster, and higher. The fixed wing aircraft is primarily a long-distance facility-to-facility transport and includes a range of multi-engine turboprop and small jet aircraft specially equipped and staffed to respond to patient needs while en route. Rotary wing service is typically engaged for moving a patient from an accident or incident scene to a trauma center, and for air transport of stable patients; helicopters are also suitably staffed and equipped for these missions.

Not all medevac transport is associated with an emergency situation. Many medevacs involve medically appropriate hospital-to-hospital transports on a scheduled basis. Medevac service providers are actively engaged in both emergency response and critical care transport.

Air transportation of patients between Seward and Anchorage is fairly common. Although Seward is connected to Anchorage via the highway system, the local volunteer ambulance service does not have enough staff to transport patients to Anchorage. Therefore, fixed-wing aircraft and helicopters are typically used for medevac transport. If air medevacs cannot operate due to weather conditions, a ground ambulance will be dispatched from Anchorage.

Three medevac operators currently provide service to Seward: LifeFlight, LifeMed, and Guardian. LifeMed and Guardian are the most common medevac operators at SWD, with approximately 300 annual operations combined (see Table 9 – Medevac Operations at SWD).

Table 9 - Medevac Operations at SWD

Medevac Operator	Aircraft	Estimated Annual Operations
LifeMed	King Air 200[1]	60
LifeMed	A-Star Helicopter	140
Guardian	King Air 200	100
LifeFlight	King Air 200	40

[1] The King Air 200 is a fixed-wing aircraft.

LifeMed and Guardian also utilize Lear Jets for medevacs. Since those aircraft require 5,000 feet of runway length, they are not used at SWD. Discussions with medevac operators indicated that Lear Jets based in Anchorage would be utilized for approximately half of the medevacs if the SWD runway were longer and the instrument approach capabilities were better.

3.5.10 Commuter Travel

Seward has not had scheduled air service since 2002. Recent contact with Alaska Airlines and RAVN Alaska, the two air operators most likely to offer commuter service, indicate they have no plans (within the foreseeable future) to offer scheduled service. When asked what would trigger the addition of SWD to their schedule, RAVN replied an increase in demand and a better approach to ensure they could offer reliable service.

RAVN does provide charter service to SWD, generally in support of the cruise ship industry. Also, RAVN provides scheduled service to Homer and Kenai Airports. A brief analysis was conducted to compare and contrast Seward with Homer and Kenai to evaluate potential for future air service to SWD.

Table 10 – Comparison with Homer and Kenai

Community	Airport	Population	Distance/Drive Time	Commercial Flights
Seward (+ Moose Pass)	SWD	5,775	127 miles/2.5 hours	0
Kenai (+ surrounding contributing communities)	ENA	33,489	157 miles/3.25 hours	10 daily
Homer (+ surrounding area)	HOM	8,408	224 miles/4.5 hours	5 daily

Homer and Kenai have better instrument approach capabilities than Seward. Homer has six published approaches, with as low as one mile visibility and minimum descent altitude of 437 feet (389-foot height above touchdown). Kenai has six published approaches, with as low as one-half mile visibility and minimum descent altitude of 298 feet (200-foot height above touchdown). Seward has a single circling approach for aircraft approach categories A and B only, with as low as 1-1/4 mile visibility and minimum descent altitude of 2,660 feet (2,638-foot height above touchdown).

The anticipated economic growth in Seward improves the probability of an air carrier increasing service to Seward. Improved approach procedures with lower minimums would also increase the likelihood of scheduled air service. Conversations with FAA Flight Standards representatives indicate an improved public approach would be difficult, if not impossible, to design in Seward. However, an improved special (private) approach designed for an individual carrier or for specially qualified aircrew and equipment may be possible. Such private approach procedures are expensive to design, so an air carrier or other sponsor would likely only pursue a private approach procedure if they felt reasonably assured that the cost would be outweighed by profit or benefit.

If a private approach was developed and the demand for air transportation increases sufficiently, carriers would most likely use charter aircraft to serve Seward again. (Scheduled air service was discontinued in 2002 due to a lack of demand.) . Demand may increase over the next 20 years to make scheduled service with the larger commuter aircraft that currently fly into Kenai and Homer a feasible option, at least seasonally. Kenai is presently served on a regular basis by the Beech 1900 (B-II) and Dash 8 (C-III) aircraft, and Homer is served by the Beech 1900.

3.5.11 Emergency Preparedness

A larger runway could support emergency preparedness. The airport can provide essential access during emergency or disaster situations when other transportation corridors (rail, harbor, and highway) are unavailable. Reportedly, during the 1964 earthquake, the airport was minimally damaged but remained the only connection with the rest of Alaska for an extended time because the railroad, the Seward Highway, and the port facilities were completely destroyed[2].

The U.S. Coast Guard (USCG) has landed C-130s at Seward in the past and would continue to use this aircraft at Seward if the pavement strength allowed it to land. The C-130 is an ADG IV aircraft used for support of search and rescue and for medical evacuation of mass casualties. The C-130 is not forecast to meet the threshold of regular use (500 annual operations), nor can the FAA fund airport improvements for military aircraft. However, the H-60 helicopters could also be used for mass casualty response. (See Appendix A for e-mail, 8/14/2014, LT Robert Hornick, C-130 Assistant Operations Officer.)

3.6 Design Aircraft and Future Aircraft Usage

The most demanding aircraft (largest wingspan and longest required runway length) currently using the airport regularly is the King Air 200, which is used for medical evacuations. While the annual operations of the medevac aircraft alone do not meet the FAA threshold of 500, the King Air 200 is part of the family of B-II aircraft serving Seward. Other ADG II aircraft operating in Seward are the air taxi and charter aircraft listed in the fleet mix (Table 8).

Air taxi, charter, and medevac operations can be expected to increase as the population increases. The population of Seward has historically grown at 1.23%. The population of the entire Kenai Peninsula Borough is forecast to grow at 0.5% annually. Seward has the potential to grow at a faster rate if the economic factors previously discussed begin to materialize (Vigor Alaska, tourism, Seward Marine Center, CDQ fleet, ARRC, and offshoots of gas and oil activities). Following consultation with the Seward Working Group, a group of local stakeholders advising the project team, it was decided that a 1.23% growth rate would be used, but that a higher growth scenario using 2% is conceivable. Table 11-Forecast Operations at SWD at 1.23% growth/*2.0% growth* shows both growth rates.

3.7 Forecasted Operations

With a 1.23% or 2.0% annual growth rate, SWD will see modest growth in aircraft operations (Table 11 presents forecasts with both growth rates), with general aviation continuing to be the dominant type of operation.

[2] Barber, Skip. *Seward Airport Master Plan, Phase II, Hydrology Report. Seward.* July 25, 2006)

Table 11 - Forecast Operations at SWD at 1.23% growth/*2.0% growth*

Operations	Base Year 2013	+5 Years	+10 Years	+15 Years
Local GA	2,000	2,127 / *2,208*	2,260 / *2,438*	2,402 / *2,693*
Itinerant GA	4,000	4,252 / *4,417*	4,520 / *4,877*	4,805 / *5,387*
Medevac	200	213 / *220*	228 / *2,43*	243 / *268*
Air Taxi/Charter	4,500	4,783 / *4,969*	5,085 / *5,485*	5,406 / *6,056*

The base year data used in this forecast are consistent with the TAF. The TAF shows no change in aircraft operations at SWD throughout the planning period, however, this will likely not be the case. Table 12 summarizes the differences between the 1.23% growth forecast and the TAF.

Table 12 - Forecast - TAF Comparison

	2018			2023			2028		
	Forecast	TAF	*Difference*	Forecast	TAF	*Difference*	Forecast	TAF	*Difference*
Local GA	2,127	2,000	***127***	2,260	2,000	***260***	2,402	2,000	***402***
Itinerant GA	4,252	4,000	***252***	4,520	4,000	***520***	4,805	4,000	***805***
Air Taxi/ Charter	4,783	4,500	***283***	5,085	4,500	***585***	5,406	4,500	***906***

4 FACILITY REQUIREMENTS

The facility requirements depend on the critical design aircraft or group of aircraft. With the increasing economic activity and population in Seward, the fleet mix providing the air taxi and charter operations will likely include a greater percentage of the larger B-II aircraft. There is a good probability that over 500 operations of the B-II family of aircraft will result from the increasing activity and changes in the fleet mix. The Seward Airport facilities should meet the B-II facility standards. This would be consistent with the 2008 Airport Master Plan and the approved Airport Layout Plan, which provides for an airport meeting the requirements for a B-II facility. A minimum runway length of 3,300 feet (consistent with a Community Class Airport such as Seward) to serve the existing based aircraft and medevac operations is recommended. Also recommended is the inclusion of a long-term plan to accommodate a runway length of up to 4,000 feet to support commuter aircraft such as the Beech 1900 and/or the Dash 8, should demand increase sufficiently. In the short term, these aircraft will be able to operate on a 3,300-foot runway, with reduced loading.

4.1 Aircraft Use at Seward

The based aircraft at Seward are similar in design characteristics and could be served by an airport designed to the standards for ADG I, Approach Category A, with a runway length of 3,300 feet or less for smaller (under 12,500 lb.) aircraft. In addition, the Alaska Aviation Preconstruction Manual identifies a minimum runway length of 3,300 feet for community class airports such as SWD. This is the minimum runway length under consideration.

According to local medevac operators, Seward routinely experiences about 200 annual fixed wing medevac aircraft operations (Table 9 - Medevac Operations at SWD). By selecting the King Air 200 as the critical design aircraft, the airport design standards increase to ADG II. US DOT T-100 statistics indicated other ADG II aircraft using Seward Airport in the past 5 years include the Beech 1900, Cessna 208 Caravan, and Pilatus PC-12.

Pilots and local officials expressed the desire for a runway that can accommodate small charter jets for tourism, emergency preparedness and search and rescue aircraft such as the Coast Guard C-130, and potential scheduled air service. FAA does not fund public airports to support military or other federal agency operations or aircraft. The Coast Guard needs to provide funding if this activity drives airport improvements.

Anecdotal information indicates that up to 20 small charter jets per year have landed at Seward in the past. A 4,000-foot runway could support this occasional demand, if the aircraft is not fully loaded (see Appendix A for runway length information provided by NetJet). Beyond the current project planning horizon, further lengthening and widening of the facility could be considered.

4.2 Wind Coverage

Wind conditions affect aircraft in varying degrees. Generally, the smaller the aircraft the more it is affected by wind, particularly crosswinds. The FAA provides the following guidance on maximum crosswind components for small to medium-sized aircraft.

Table 13 – Allowable Crosswind Components by Aircraft Design Group

Aircraft Design Group	Allowable Crosswind Component
ADG I (Cessna 170, 185, 206)	10.5 knots
ADG II (King Air200, 1900; Cessna 208, Grand Caravan)	13 knots
ADG-III (DC-6, Dash 8, 737)	16 knots

Wind coverage is the percentage of time crosswind components are below an unacceptable velocity. A runway oriented to provide the greatest wind coverage with the minimum crosswind components is preferred. The desirable wind coverage for an airport is 95%. A second (crosswind) runway is recommended when the primary runway orientation provides less than 95% wind coverage.

Based on the current wind data available for Seward, a single runway oriented between 156 and 204 degrees north azimuth provides 95% or greater wind coverage (for ADG I aircraft).

- Runway 16/34 is oriented at 183 degrees, providing 98.6% wind coverage for ADG I aircraft, and 99.5% coverage for ADG II aircraft.
- Runway 13/31 is oriented at 146 degrees, providing 91.1% coverage for ADG I aircraft and 96.0% coverage for ADG II aircraft.

4.3 Airfield Requirements

4.3.1 Runways

Given the modest number of operations and slight growth anticipated in Seward, a greater growth factor in the forecast of operations would not show an increase great enough to warrant substantial changes in the facility requirements.

A single runway can handle between 62,000 and 131,000 operations annually. This is based on VFR conditions, calculations with taxiway at midpoint, and the airport open for operation 8 to 12 hours per day for 5 to 7 days per week. The Seward Airport experiences 10,700 operations currently, significantly less than 62,000. Projected operations are 14,404 in 15 years with a 2% growth forecast, also significantly less than 62,000. Thus operations can be accommodated by a single runway. Parallel taxiway systems to help improve runway capacity and minimize user delays are typically not warranted until annual operations approach 20,000. In 2015 the forecast indicated 10,178 operations for Seward Airport.

Facility requirements are listed in the table below for three potential groups and compared with the larger of the two existing runways.

Table 14 – Runway Dimensional Standards for Various Scenarios

Feature	Current Based Aircraft Group	Current Demand & Medevac (King Air 200) *Recommended for Near-Term Development*	Growth Scenario & Emergency Preparedness (Beech 1900) *Consider for Long-Term Development*	Existing RW 13-31
Approach Category	A	**B**	B	B
ADG	I	**II**	II	II
Runway Length	3,300' (Note 1)	**3,300' (Note 1)**	4,000'/4,700' (Note 2)	4,249'
Runway Width	60'	**75'**	75'	100'
Visibility Minimums	1 mile	**1 mile**	1 mile	1 mile
Crosswind Component	10.5 knots	**13 knots**	16 knots	13 knots
Runway Safety Area	120' x 3,780'	**150' x 3,900'**	150' x 5,300'	150’ x 4,749'
Object Free Area	400' x 3,780'	**500' x 3,900'**	500' x 5,300'	500' x 4,749'
RPZ	1,000' x 500' x 700'	**1,000' x 500' x 700'**	1,700' x 500' x 1,010'	1,000' x 500' x 700'
Part 77 Primary Surface	500' x 3,700'	500' x 3,700'	500' x 5,100'	500' x 4,649'
Part 77 Approach Slope	20:1 (Visual)	20:1 (Visual) (Note 3)	20:1 (Visual) (Note 3)	20:1 (Visual)

Table 14 Notes:

1. Minimum runway length for community airports per Alaska Aviation Preconstruction Manual exceeds FAA AC 150/5325-4B (2,750 feet for 95% of fleet or 3,250 feet for 100% of fleet) and King Air 200 published takeoff and landing distances.
2. The 4,700-foot runway length is based on FAA AC 150/5325-4B for aircraft over 12,500 lbs. but less than 60,000 lbs. (75% of fleet at 60% useful load). The FAA is circulating a Draft AC 150/5325-4C, which

recommends using manufacturer's airport planning manuals for all large airplanes (over 12,500 lbs.). The Beech 1900D specification and performance sheet lists a takeoff length of 3,737 feet. Discussions with the primary air carrier in Alaska using this aircraft indicated a need for a 4,000-foot runway to accommodate it. A 4,000-foot runway option is being considered, which would accommodate the Beech 1900 and other large aircraft such as the Dash 8 and Sherpa.

3. By definition, a non-precision instrument (NPI) approach runway means a straight-in approach is planned or has been approved (Part 77.2). SWD's approach is currently a circling approach (RNAV [GPS]-A). Review of the FAA flight standards and local topography indicates a straight-in approach is not viable at Seward due to the mountainous terrain on all sides.

4.3.2 Taxiways / Taxilanes

Taxiways should be upgraded to meet the current standards. Major changes to taxiway standards have been made in the revisions to AC 150/5300-13 and AC 150/5300-13A since the design of the current airport. The critical aircraft (the wheelbase and distance between the cockpit and main gear of the design aircraft) as well as the airplane design group, determine the taxiway geometry. Current guidance indicates the taxiway intersections with runways should avoid the middle one third of the runway length. ¶401.b(5)(d) defines as a "high energy" intersection that should be avoided. "By limiting runway crossings to the outer thirds of the runway, the portion of the runway where a pilot can least maneuver to avoid a collision is kept clear." Taxiways A and D currently conflict with this guidance and will be resolved during design.

Further, taxiways providing direct access from the aircraft parking areas to a runway should be avoided (¶401.b(5)(g) and ¶503.). Taxiways C, D, E, and F currently conflict with this guidance. Future layouts should consider correcting this deficiency.

The key dimensional standards that need to be considered in developing the layout of facility improvements are listed in the table below.

Table 15 – Taxiway and Taxilane Design Dimensions Based on Aircraft Design Group (per AC 150/5300-13A; Table 4-1)

Feature	Near Term & Ultimate – B-II (King Air 200 & Beech 1900)	Existing
Runway to Taxilane Separation	240'	184' (Note 1)
Taxiway Safety Area	79'	79'
Taxiway OFA	131'	131'
Taxilane OFA	115'	131'
Taxilane Centerline to Fixed or Movable Object	57.5'	
Taxilane Wing Tip Clearance	18'	

Table 15 Note 1. Separation distance shown on 2008 ALP between Runway 16/34 CL and GA apron taxilane (A-I small requires 150 feet).

To meet the dimensional standards above and preserve the existing BRL and GA apron size, a runway parallel to the apron (Runway 16/35) would need to have a runway-to-BRL separation of 394.5 feet; the existing Runway 16/35 is separated from the BRL by only 300 feet. Additional separation may be needed to provide acceptable taxiway grades if the runway is raised and to correct the layout deficiency of taxiways that provide direct access from the runway to aircraft parking areas.

4.4 Navigational Aids and Airfield Lighting

One set of VASI lights is installed on Runway 31. The previous master plan indicated the VASI should be replaced with PAPIs on both ends of all runways. This is not feasible at Seward, because of the terrain on the north end of the airport. Only the south end of each runway (Runway 31 and Runway 34) can achieve the PAPI Obstacle Clearance Surface, which extends 4 miles out from the end of the runway.

The airfield lighting system is old and should be upgraded and expanded to include taxiways and all runways.

During any paving project, the runway and taxiway markings should be replaced with markings that meet current guidance. Seward Airport runways will continue to be marked as visual runways. SWD currently has a published GPS approach for Category A and B aircraft, but it is rarely used because of the high minimum descent altitude (2,660 feet). This published approach is not a straight-in approach, so the runway is not considered an NPI runway. There are no instrument approaches for Category C and D aircraft.

Lower minimums would make the airport more reliable and would weigh into the consideration for a commuter air taxi service to start scheduled service into Seward. Discussions with the FAA about lowering the minimums, however, did not result in optimism that this would occur. The surrounding terrain is an onerous constraint to improving the approaches in/out of Seward. (See phone log, Appendix A, conversation dated 2/6/2015 with Kyle Christianson of FAA.)

4.5 Other Facility Requirements

A new sand storage building is needed; the existing building is in poor condition.

The airport access road, Seward Highway, and the Alaska Railroad are all within the RPZ of Runway 13. A small portion of the RPZ of Runway 16 overlaps the access road. Although prior to FAA's Interim Guidance on Land Uses within a Runway Protection Zone (9/27/2012) these transportation uses were acceptable, they are not encouraged. Additionally, due to their proximity to the end of Runway 13, these transportation features create an obstruction to that approach. Correction of these non-standard conditions should be considered to the extent practicable.

5 ALTERNATIVES

5.1 Initial Alternative Development

Development of design alternatives requires an understanding of existing conditions and considerations that could impact the reasonableness of any alternatives. Information gained from site visits, data collection, public involvement, and coordination with airport stakeholders, combined with the facility requirements listed above, influenced the identification and development of alternatives for the Seward airport.

5.1.1 Considerations and Constraints in Developing Alternatives

- Surrounding topography that limited the practicality of airport relocation (see map, right)

- The need to consider different runway lengths to provide various potential levels of service to the community
- The Federal Emergency Management Agency (FEMA) defined floodway, floodplain, and coastal flood zone (VE) designations, which affect layout and build elevations for the facilities
- Adjacent built features (such as the railroad, roads, etc., at the northern end of the airport) that could cause substantial cost or be impractical to relocate
- Adjacent privately owned property
- Wind coverage (determining whether a single runway could provide 95% coverage)
- Proximity of the port facilities of the Alaska Railroad Corporation (ARRC) and ARRC's future plans
- DOT&PF's decision not to dredge or reroute the channel due to the maintenance cost of continued dredging, the unpredictability of the long-term changes this could cause, and the potential for unforeseen impacts to owners of adjacent property (such as properties across the channel)

Other considerations such as cost, function, and environmental impacts of the various alternatives were used as evaluation criteria for comparing the alternatives against each other and the no-build alternative.

5.1.2 Initial Alternatives

Development of the alternatives began with five concepts initially developed for preliminary discussion at the 2015 November SWG meeting. These alternatives evolved as additional information was discovered, analysis was completed, or direction provided. The process of refining the original five concepts resulted in the eight alternatives presented in Table 16 below.

Table 16 - Initial Alternatives

Alt	Main Runway Disposition	Crosswind (CW) Runway Disposition	Hydraulic Analysis
1.1	Raise the existing main runway (maintain existing length) - protect from overtopping and protect from erosion	Raise north end to match into raised main runway	Use Q100 with 2-foot freeboard on main runway. This option is within the Regulatory Floodway; consider impacts to properties due to potential for large WSEL increase.
1.2	Allow overtopping of main runway, but protect from erosion and allow reuse shortly after flood event ends	Depending upon the hydraulic analysis, improvements may be needed	Use Q100 with 2-foot freeboard on CW runway. Depending upon the design storm, CW runway may need a grade raise and/or erosion protection.
2.1	Allow breach	Offset CW runway from apron to allow Design Group II; **shift threshold south to avoid road and rail**; widen to 75' (150' Runway Safety Area (RSA) and lengthen to **3,300' (3,900' RSA)**	Use Q100 with 2-foot freeboard on CW runway. Raise CW runway elevation; provide erosion protection; provide protection for the portion in the VE zone.

Alt	Main Runway Disposition	Crosswind (CW) Runway Disposition	Hydraulic Analysis
2.1a	Protect from breach but do not raise the embankment height	Same as above; maybe less erosion protection	Use Q100 with 2-foot freeboard on CW runway. More erosion protection required to protect both embankments.
2.2	Allow breach	Offset CW runway from apron to allow Design Group II; **shift threshold north to avoid VE zone impacts;** widen to 75' (150' RSA) and lengthen to **3300' (3900' RSA);**	Use Q100 with 2-foot freeboard on CW runway. Raise CW runway elevation; provide erosion protection.
2.2a	Armor to protect from breach but do not raise the embankment height	Same as above; maybe less erosion protection	Use Q100 with 2-foot freeboard on CW runway. More erosion protection required to protect both embankments.
3.0	Allow breach	Offset CW runway from apron to allow Design Group II; shift alignment to avoid ARRC on south end, shift north to reduce impact in VE zone; widen to 75' (150' RSA) and lengthen to **4,000' (4,600' RSA)**	Use Q100 with 2-foot freeboard on CW runway. Raise CW runway elevation; provide erosion protection; provide protection for the portion in the VE zone.
4.0	Allow breach	Same alignment and north threshold point as Alt 3.0; lengthen to **4,700' (5,300' RSA)**	Use Q100 with 2-foot freeboard on CW runway. Raise CW runway elevation; provide erosion protection; provide protection for the portion in the VE zone.

5.1.3 Initial Alternatives Analysis

Once the layouts were defined, the next step was to determine the appropriate hydrological parameters, such as flood frequency and freeboard (a measure of the relative height of the flood line), to use to set the surface elevations of the runways. To establish these parameters, hydrologists from Hydraulic Mapping and Modeling (HMM), and DOT&PF drafted a series of technical memoranda and other coordination documents (see Appendix B) that were then discussed among the consultant team and DOT&PF. These actions culminated in the decision to use the 100-year (Q100) flood frequency, and a freeboard of 2 feet. This decision agrees with Federal guidance.

Another consideration identified during discussion of the hydrological parameters was the closure of Runway 13/31. If Runway 13/31 were closed, the embankment could be either (a) armored to serve as a dike to help prevent lateral migration of the main channel, and therefore protect an improved and expanded Runway 16/34, or (b) it could be left as is, allowing future flood waters to breach it. In either case, Runway 16/34 would need to be armored, because the closed runway would not be raised to prevent flooding.

5.1.4 Dropping of Alternative 1.2 from Further Evaluation

Alternative 1.2 would reconstruct Runway 13/31 without raising the runway elevation. As compared to Alternative 1.1, this solution would reduce potential impacts to the mapped floodway, but at the cost of allowing the runway to be flooded on a frequent basis. This option was not carried forward for more detailed review because it was considered impractical:

- The runway would be unreliable due to the frequent flooding.
- Construction costs would be as much as 50% higher than for Alternative 1.1 due to the thicker embankment, the use of crushed rock wrapped in geotextile, and the installation of floodwater erosion protection on the west side of the runway.
- Maintenance and operation (M&O) costs would be substantially higher to cover frequent clearing of the debris after each overtopping event plus likely additional costs to repair pavement and airport lighting.

An initial analysis indicates overtopping would occur for at least 12 to 21 days each year. However, this likely underestimates the overtopping duration because of the shortness and age of the discharge record period (1964–1968) and the fact that the years in that record were low-average years.

5.1.5 Dropping of Alternatives 2.1, 2.1a, and 2.2a from Further Evaluation

Initial concepts for the alternatives that expanded Runway 16/34 kept the railroad and the roadway on the north end outside of the RPZ. Subsequently, when consultation between DOT&PF and FAA determined this was a preference but not necessarily a constraint, alternatives 2.1 and 2.1a were dropped from consideration in favor of alternatives that shifted the runway embankment north, out of the coastal flood zone (VE). Alternatives 2.1a and 2.2a also called for armoring the closed runway. These options were ultimately dropped because of the higher cost to armor both runways with no additional benefit to the airport facilities when compared with options that armored Runway 16/34 only. The alternatives that allow the river to breach the old RW 13/31 embankment allow a wider space for the river to traverse, lowering the potential flood elevation.

5.1.6 Dropping of Alternatives 3.0 and 4.0 from Further Evaluation

Alternatives 3.0 and 4.0 would close Runway 13/31 and reconstruct Runway 16/34 to 4,000 feet long. As compared to Alternative 2.2, these solutions would lengthen Runway 16/34 to 4,000 feet and 4,700 feet, respectively. Based on the forecasted use of the airport in the near-term (0-5 years) and even mid-term (6-10 years), and in conversations with FAA, demand will not justify use of FAA Funds to lengthen the runway beyond 3,300 feet. Alternatives 3.0 and 4.0 would meet potential future demand for operations with the Beech 1900 or for emergency preparedness, but exceed the needs of the current forseeable demand. Future planning will accommodate the 4,000 foot length but due to insufficient funding, it was dropped from evaluation for the EA.

5.2 Alternative Refinement and Consultant Team Evaluation Process

As a result of the considerations discussed above, and in coordination with DOT&PF, it was determined that only the two highlighted alternatives (Alternatives 1.1 and 2.2) were viable alternatives to be carried forward with the no-build alternative for more detailed analysis. The more detailed development of these two alternatives was an iterative process.

- HMM provided preliminary design flood (Q100) elevations.

- PDC modeled the alternatives; based on the Q100 elevation and 2-foot freeboard, the alignment of Runway 16/34 shifted (Alternative 2.2) so that Taxiway grades would meet FAA standards.
- HMM modeled the alternatives with HEC-RAS (a computer program that predicts the hydraulics of water flow), determined initial impacts to the flood elevations (including coastal flooding effects from the 1%-annual-chance tide event, which govern up to Cross-Section E), and identified potential scour velocities and depths. This resulted in further refinement of the alternatives.
- The scour depths and velocities resulted in preliminary recommendations for riprap size, thickness, and volumes (to accommodate scour).
- PDC estimated earthwork quantities, including the excavations necessary to install the riprap.

The key elements of the finalized concept alternatives are presented below. All alternatives meet the dimensional and grading standards for Design Group II. Figures depicting each of the alternatives, including the extents of erosion protection and the riprap size and thickness, are attached for reference.

5.2.1 Alternative 1.1

Alternative 1.1 (Figure 2) would reconstruct and raise Runway 13/31 above the 100-year flood level (Q100) with 2 feet of freeboard, and install armor to protect it. The runway would remain 4,249 feet long, but be narrowed from 100' to the B-II standard of 75'. Runway 16/34 would be raised on the north end to match into the new profile for Runway 13/31. Taxiways B and C would be reconstructed to match into the new Runway 13/31 profile, and entrance Taxiways A, D, and E would be eliminated in accordance with new FAA guidance that disallows taxiways entering the runway in the middle one-third of the runway.

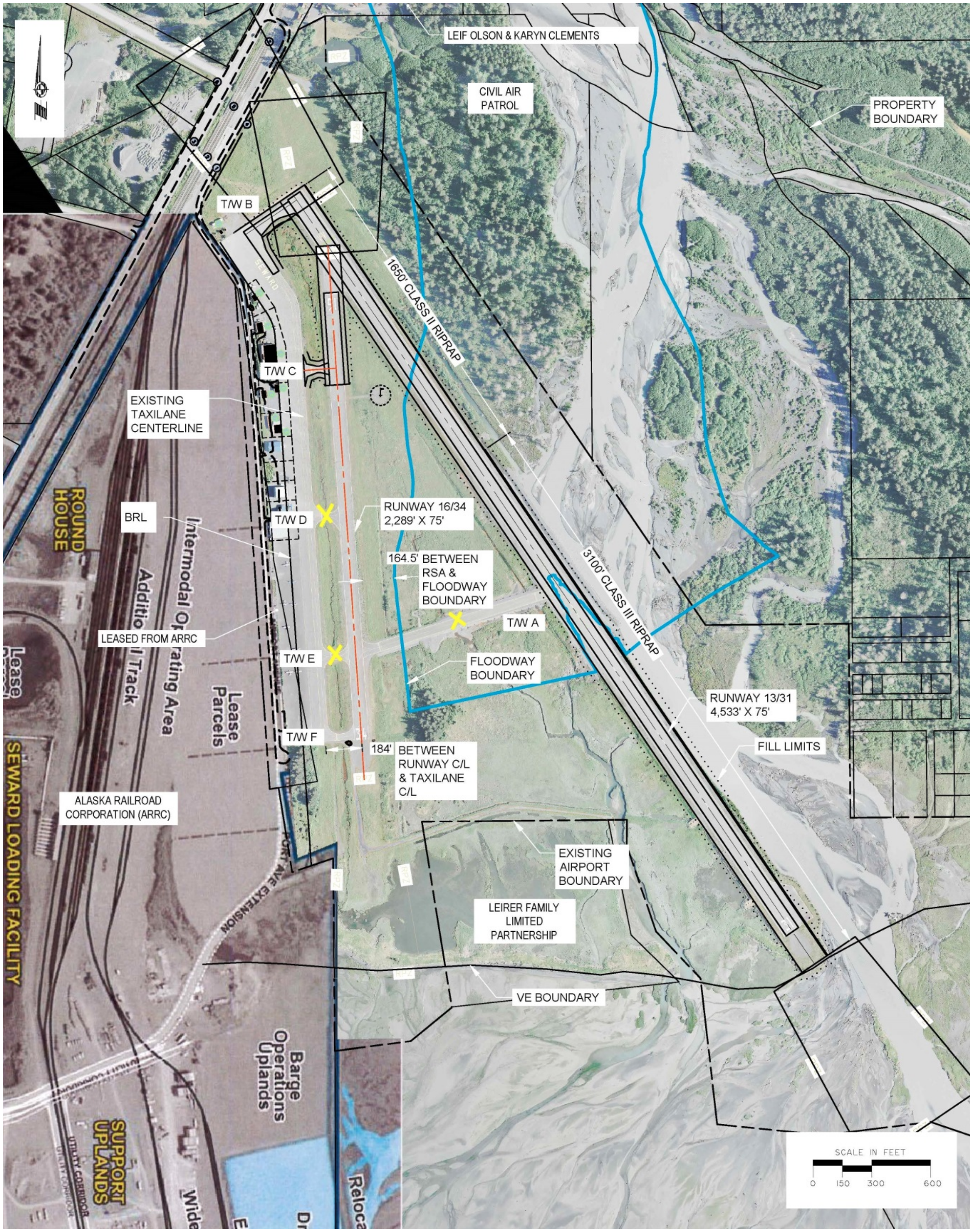

Figure 2 - Alternative 1.1

5.2.2 Alternative 2.2

Alternative 2.2 (Figure 3) would close Runway 13/31 and reconstruct Runway 16/34. Alternative would shift Runway 16/34 to the east and raise it above 100-year flood level with 2 feet of freeboard (shifting the runway minimizes changes to the apron and adjoining lease area/buildings). Armor would be installed to protect Runway 16/34; since Runway

13/31 will likely be overtopped and could subsequently be breached, flood water will likely reach this embankment. Taxiways B would be relocated and Taxiway F would be reconstructed to match into Runway 16/34 location and grade changes. Taxiways A, D, and E would be eliminated in accordance with new FAA guidance.

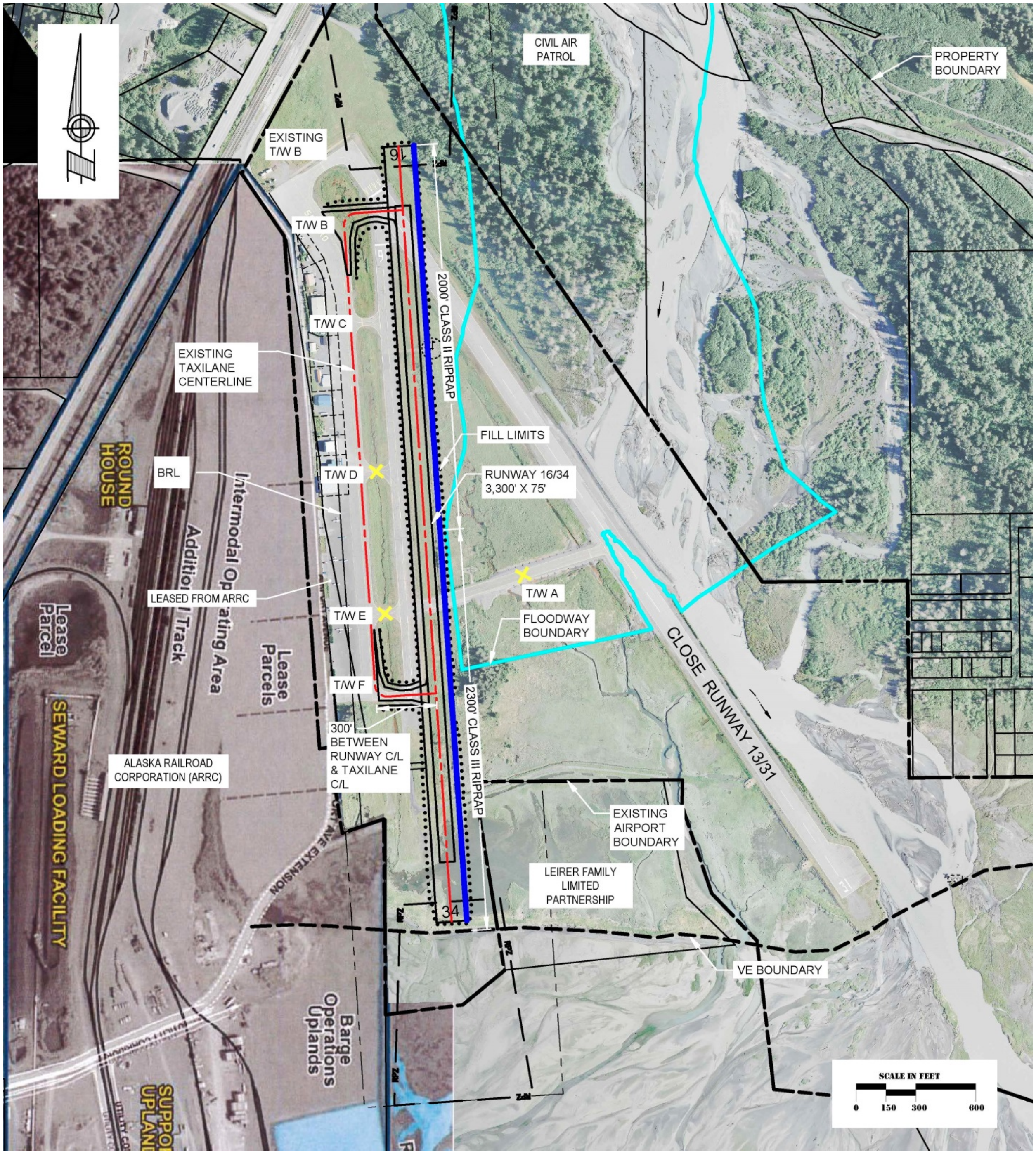

Figure 3 - Alternative 2.2

5.2.3 Evaluation

Evaluation criteria were developed by the consultant team in conjunction with DOT&PF. The criteria were selected to aid in evaluating the important differences between each of the alternatives. The criteria can be broadly grouped into four primary categories:

- Cost
- Ability to serve the community's needs
- Engineering and user considerations or function
- Environmental considerations

A matrix of evaluation criteria, included in Appendix B, was prepared to help with the selection process.

The construction cost comparison only considers the key differences between the alternatives under evaluation and does not include all costs that could be associated with construction. For instance, mobilization and demobilization would be similar for each of the projects and thus were not considered a differentiating item, whereas embankment items such as borrow, riprap, and pavement are substantially different between the alternatives.

Right of Way costs are approximate planning-level estimates based on the additional area of flooding and the assessed value of the flooded property.

No jurisdictional agency scoping had been completed at this point. Anticipated environmental impacts were based largely upon evaluations presented in the 2008 Environmental Assessment and the experience of the consultant team.

The consultant team and the DOT&PF held two work sessions to compare the alternatives, reviewing each criterion and comparing each alternative against the no-build and against each other to ascertain the relative magnitude of difference.

5.3 Alternatives To Be Carried Forward for NEPA Environmental Scoping

To this point alternative development and evaluations have included coordination with the Seward Working Group and the public as well as detailed engineering evaluations and an environmental overview. The environmental overview was based on information presented in the 2008 EA, and with updates of more recent information that was readily available, see Environmental Section 6.0 below. Both Alternatives 1.1 and Alternative 2.2 appear viable, although both alternatives have a number of potential impacts that rank more than negligible. The appropriate next step is to conduct formal Scoping (NEPA Scoping). This step will allow the jurisdictional agencies to comment on the severity of potential impacts and help in the determination if either alternative could be eliminated before advancing to the full Environmental Assessment.

6 ENVIRONMENTAL REVIEW

As of January 2017, the initial environmental analysis included review of available environmental documents, office and online research, a field visit, and coordination with agencies and the public. Table 6.1 summarizes the results of this work and indicates anticipated impacts from the two build alternatives and the No-Build Alternative.

Table 17 – Environmental Checklist

Environmental Impact Category *(based on FAA 5050.4B)*	Potential Environmental Impacts			
	Non-Issue	Negligible	Minimal or Moderate	Substantial
Air Quality	✓ No-Build	✓ 1.1, 2.2		
Biological Resources (including fish, wildlife, and plants)	✓ No-Build		✓ 1.1, 2.2	
Climate		✓ 1.1, 2.2	✓ No-Build	
Coastal Resources	✓ No-Build	✓ 1.1, 2.2		
Section 4(f)	✓ No-Build, 1.1, 2.2			
Farmlands	✓ No-Build, 1.1, 2.2			
Hazardous Materials, Solid Waste, and Pollution Prevention	✓ No-Build	✓ 1.1, 2.2		
Historical, Architectural, Archaeological, and Cultural	✓ No-Build	✓ 1.1	2.2	
Land Use	✓ No-Build	✓ 1.1	✓ 2.2	
Natural Resources and Energy Supply		✓ No-Build, 1.1, 2.2		
Noise and Noise-Compatible Land Use	✓ No-Build, 1.1, 2.2			
Socioeconomics		✓ 1.1, 2.2	✓ No-Build	
Environmental Justice		✓ No-Build, 1.1, 2.2		
Children's Health and Safety Risks		✓ 1.1, 2.2	✓ No-Build	
Visual Effects	✓ No-Build	✓ 1.1, 2.2		

Environmental Impact Category	**Potential Environmental Impacts**			
(based on FAA 5050.4B)	Non-Issue	Negligible	Minimal or moderate	Substantial
Wetlands		✓ No-Build	✓ 1.1, 2.2	
Floodplains		✓ No-Build	✓ 2.2	✓ 1.1
Surface Waters	✓ No-Build	✓ 2.2	✓ 1.1	
Ground Water	✓ No-Build 1.1, 2.2			
Wild and Scenic Rivers	✓ No-Build, 1.1, 2.2			

The following sections detail the rationale for the checklist designations in Table 6.1. These impact categories are based on FAA guidance documents FAA Order 1050.1F as well as the 1050.1F Desk Reference. The level of supporting detail reflects preliminary scoping efforts. Further analysis and documentation of impacts will occur as part of the Environmental Assessment effort highlighted in Section 6.4.

6.1 Air Quality

The study area does not fall within an air quality nonattainment or maintenance area. The proposed project is not likely to result in any permanent air quality impacts, as all disturbed areas will be permanently stabilized after project completion. Air quality degradation during construction may result from equipment exhaust and disturbed soil particles that become airborne. These impacts would be mitigated through the use of Best Management Practices (BMP) such as watering to minimize dust, and routine equipment maintenance.

6.2 Biological Resources (including fish, wildlife, and plants)

The proposed alternative 1.1 could place fill below ordinary high water (OHW) of Resurrection River and other streams to improve runways and taxiways. Temporary adverse impacts from construction would occur, such as increased turbidity and sedimentation. In alternative 2.2, DOT&PF will coordinate with and obtain appropriate authorization from the U.S. Army Corps of Engineers (USACE), NMFS, and ADF&G prior to work that may involve anadromous or resident fish streams. Alternative 2.2 will impact an existing wildlife viewing area. Public comment was received over the loss of an area adjacent to the airport property that is utilized by migratory birds, and for bird watching.

The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC) website, reviewed on December 14, 2016, indicated that the following species of migratory birds could potentially be affected by activities in this location:

- Bald Eagle *Haliaeetus leucocephalus* (season: year-round);
- Black Oystercatcher *Haematopus bachmani* (season: year-round);
- Fox Sparrow *Passerella iliaca* (season: breeding);
- Kittlitz's Murrelet *Brachyramphus brevirostris* (season: breeding);

- Lesser Yellowlegs *Tringa flavipes* (season: breeding);
- Marbled Godwit *Limosa fedoa* (season: breeding);
- Marbled Murrelet *Brachyramphus marmoratus* (season: year-round);
- Olive-sided Flycatcher *Contopus cooperi* (season: breeding);
- Pelagic Cormorant *Phalacrocorax pelagicus pelagicus* (season: year-round);
- Rock Sandpiper *Calidris ptilocnemis ptilocnemis* (season: migrating);
- Rufous Hummingbird *selasphorus rufus* (season: breeding);
- Short-billed Dowitcher *Limnodromus griseus* (season: breeding); and
- Short-eared Owl *Asio flammeus* (season: breeding)

According to the USFWS, in Southcentral Alaska the recommended time period for avoiding vegetation clearing on shrub or open habitat (shrub cover or marsh, pond, tundra, gravel, or other treeless/shrubless ground) is May 1 through July 15. Clearing and grubbing would not occur within the migratory bird window, except as permitted by federal, state, and local laws.

Although migratory birds may temporarily avoid the project area during construction activity, the proposed project is not likely to result in permanent adverse effects to wildlife, due to pre-existing levels of development and disturbance at the airport.

A search of the University of Alaska Southeast and USFWS *Wetland Ecosystems Protocol* website on July 21, 2016, indicated that there are four bald eagle nests within 1,000 feet of the proposed project area:

- Nest No. 5/Object ID 1865 is located within the project area and about 365 feet northeast of Runway 13/31 at 60.1333, -149.4167.
- Nest No. 14/Object ID 1873 is located approximately 290 feet east of the airport and about 789 feet northeast of Runway 13/31 at 60.1349, -149.416.
- Nest No. 6/Object ID 1657 is located approximately 733 feet northeast of the airport and about 1,125 feet northeast of Runway 13/31 at 60.1321, -149.41.
- Nest No. 11/Object ID 1661 is located approximately 911 feet north of the airport and about 1,677 feet north of Runway 13/31 at 60.1396, -149.4235.

It is not anticipated that this project would directly disrupt nests; however, DOT&PF would coordinate with the USFWS to determine an appropriate course of action since some bald eagle nests are active and fall within the primary (330 feet) or secondary (660 feet) protection zones.

The Short-tailed Albatross (*Phoebastria albatrus*), humpback whale (*Megaptera novaeangliae*), North Pacific right whale (*Eubalaena japonica*), and the sperm whale (*Physeter microcephalus*) are known to occur in Resurrection Bay, and for the Albatross also in nearby areas. DOT&PF does not anticipate the proposed project would impact or adversely affect these species as no direct impacts to Resurrection Bay are anticipated as part of the proposed project.

6.3 Climate

None of the Alternatives is associated with a significant increase in Airport operations. Greenhouse gas emissions associated with increased air traffic is not expected. Alternative 1.1 would restore airport operations to previous levels, which would result in higher greenhouse gas emissions over the No-Build Alternative. Alternative 2.2 would result in a limited increase in airport operations because the 3,300-foot runway will limit operations by larger aircraft (Lear jets and C-130s).

The impacts of climate change would most affect the No-Build Alternative. The frequency of large storm events is increasing. A rise in sea-levels will increase the severity of storms at the Resurrection River delta. The hydrology and hydraulic report for this project took into account these future changes when recommending design elevations for both Alternatives 1.1 and 2.2.

6.4 Coastal Resources

It is not anticipated that Resurrection Bay would be directly impacted by the proposed project. Alternative 2.2 would result in development in close proximity to the bay. Breaching of the main runway will likely result in deposition of existing material into the delta. Alternative 1.1 would cause placement of fill into the river, resulting in a rise in the Base Flood Elevation (BFE). This would impact upstream areas along the Resurrection River, but would likely be negligible in the Bay. See Section 6.14.2 for more information on floodplain impacts.

6.5 Department of Transportation 4(f)

The proposed project area does not include any public park, recreation area, wildlife, and waterfowl refuge of national, State, or local significance. It does not include land from a historic site of national, State, or local significance.

6.6 Farmlands

The proposed project area does not include any farmland.

6.7 Hazardous Materials, Solid Waste, and Pollution Prevention

The nearest *Active* contaminated site is located 1,700 feet west of Airport Road and off of airport property. There are 3 ADEC contaminated sites listed as Cleanup Complete, and one as Cleanup Complete-Institutional Controls. Although the known risk of encountering hazardous materials is low with both Alternatives 1.1 and 2.2, there is a slight risk above that for the no-build, which would require no excavation or other earth disturbing activities.

Table 18– Contaminated Sites In and Adjacent to Project Area

Site Name	File Number	Contamination Type	Approximate Location	Activity Status
Seward Military Resort	2102.26.069	Contaminated soil and groundwater at the site from a broken underground storage tank supply line	1,700 feet west of Airport Road	Active
ARRC Seward Rail Yard	2332.38.002	Diesel range organic contamination from leaky heating oil underground storage tank	880 feet west from the airport and 1,166 feet west of RW 16/34	Cleanup Complete - Institutional Controls
ARRC Henderlong Building Seward	2332.38.033	Benzene and toluene were found in soil	600 feet southwest of the airport and 1,265 feet from RW 16/34	Cleanup Complete
Harbor Air Service	2332.38.005	Soil contamination from abandoned 55-gallon drums	270 feet west of RW 16/34	Cleanup Complete
City of Seward - Sewer Lift Station #4	2332.26.014	Diesel range organic contamination from leaky underground storage tank	2,000 feet northwest of Airport Road	Cleanup Complete

6.8 Historical, Architectural, Archaeological, and Cultural Resources

Based on a Cultural Resources Survey conducted in 2004 by Northern Land Use Research for the Seward Airport Master Plan effort, and presented in the 2008 Finding of No Significant Impact, the following sites are in the vicinity of the airport property.

- Site No. SEW-148, associated with the Seward Moose Pass Trail (previously Iditarod National Historic Trail), runs discontinuously adjacent to the railroad; portions of this trail fell into disuse after the completion of the Alaska Railroad in 1923.
- Site No. SEW-007 is associated with the Russian Trail dating back from the Russian Period; the exact location of this site has not been identified. Remnants of an old road at the southern end of the project area could relate to Site No. SEW 007.
- Site No. SEW-835, the Naval Radio Station, is located on the eastern bank of Resurrection River, east of the project area.

The State Historic Preservation Officer (SHPO) determined these resources to be ineligible for the National Register of Historic Places (NRHP). Alternative 1.1 will have less impact to previously undisturbed land and therefore less likely to affect undiscovered cultural resources. Alternative 2.2 will develop several acres of previously undisturbed land but previous investigations have not provided evidence to indicate a high likelihood of encountering undiscovered cultural resources.

In accordance with the Alaska Historic Preservation Act, DOT&PF will coordinate with the appropriate agencies and entities to determine potential impacts to historic, archaeological, and cultural resources.

6.9 Land Use

The Seward Moose Pass Trail (previously Iditarod National Historic Trail) runs discontinuously adjacent to the railroad; portions of this trail fell into disuse after completion of the Alaska Railroad in 1923.

The largest landowner adjacent to the airport is the ARRC, which owns all of the property on the west side of the airport. There is some concern from ARRC that development of Alternative 2.2 would result in airspace restrictions that could impact proposed marine freight development.

The Civil Air Patrol (CAP) owns a large parcel of land to the northeast of the airport, but most of this parcel lies within the Resurrection River floodplain making future development unlikely. The other parcels of land adjacent to the airport are relatively small and are owned either by individuals or the City of Seward. There is a private property bounded by the airport that is used by migratory birds and for bird viewing. The only land access to this parcel is across Airport property. This land use is generally incompatible to safe airport operations.

There are no designated refuges, critical habitat areas or sanctuaries within or adjacent to the proposed project area. The Chugach National Forest is about 1 mile from the proposed project area. Kenai Fjords National Park is approximately 4 miles from the proposed project area, and Caines Head State Recreation Area is about 7 miles from the proposed project area. DOT&PF does not anticipate the proposed project would result in any adverse impacts to these parks, forests, or recreational areas.

6.10 Natural Resources and Energy Supply

Both Alternative 1.1 and 2.2 would require asphalt and base material for construction. The No-Build Alternative has high maintenance and operation needs in order to repair storm damage to Runway 13/31. These efforts have included placement of riprap along the embankment of Runway 13/31, as well as repairs to the Runway surface. Future efforts would likely include resurfacing the runway.

6.11 Noise and Noise-Compatible Land Use

The projected operations for the Seward Airport do not approach the operational thresholds requiring a noise analysis. Land use of property adjacent to the airport includes a rail yard, harbor, river delta, and residential areas. The low level of activity at the airport, and an absence of noise complaints by residents, indicate that noise has not been a substantive issue in the area.

6.12 Socioeconomic, Environmental Justice, and Children's Health and Safety Risks

The proposed project is not anticipated to adversely affect neighborhoods, community cohesion, or disadvantaged social groups. Alternative 1.1 would result in an increase to the BFE, and would likely require property acquisitions to mitigate for the increased flood impact potential. Should this alternative be carried forward for further consideration, DOT&PF will evaluate whether any disadvantaged social groups are disproportionately affected by the increased flood elevations.

The No-Build alternative would result in either continued high cost maintenance, or the eventual decision by the DOT to discontinue or reduce maintenance, which could then result in the closure of portions of the airport. As the runway deteriorates, the facility would no longer be able to effectively meet the needs of the Community. This has the potential to affect the health and safety of residents where such services are needed.

Alternatives 1.1 and 2.2 provide a working runway, which will allow the airport to resume regular operations. Alternative 1.1 supports use by Lear Jets, as well as large cargo and passenger planes which used the runway infrequently prior to the weight restrictions. Alternative 2.2 allows for occasional use by passenger planes, if not fully loaded and it does not preclude the future expansion of Runway 16/34 should demand increase.

6.13 Visual Effects

There are no visually-protected coastal areas, Wild and Scenic Rivers, sensitive wildlife species, Section 106 or Section 4(f) resources within or near the project area which could be affected by light emissions or changes to visual resources and visual character. None of the proposed upgrades to the airport lighting are anticipated to disturb nearby residences or create off-airport glare.

6.14 Water Resources

6.14.1 Wetlands

DOT&PF conducted a Wetland Delineation and Aquatic Site Assessment in 2004, to determine the presence and extent of wetlands for use in the 2008 Seward Airport Master Plan Environmental Assessment and Finding of No Significant Impacts. DOT&PF field checked the 2004 delineation in September 2016, and updated wetland boundaries. Identified wetland types include: Estuarine and Marine Deepwater (E1UBL); Estuarine and Marine Wetland (E2USN, E2USM, E2EM1P); Freshwater Pond (PUBH); Riverine (R3USC, R3UBH); and Freshwater Forested/Shrub Wetland (PFO1/SS1A, PSS1A, PSS1/EM1R, PSS1/EM1C).

Placement of fill in wetland areas is anticipated for the improvements at the airport. DOT&PF will design the project such that wetland impacts are avoided or minimized to the maximum extent practicable. DOT&PF will comply with mitigation guidelines for any impacts that cannot otherwise be avoided. For the purpose of the initial comparison, preliminary estimates of wetland impacts are 5 acres for Alternative 1.1 (see Figure 4) and 13.5 acres for Alternative 2.2 (see Figure 5). Temporary work areas or vegetated buffers may be located in wetlands if other upland areas are not available. Any such impacts would be included as part of the USACE's Section 404 wetland permitting process.

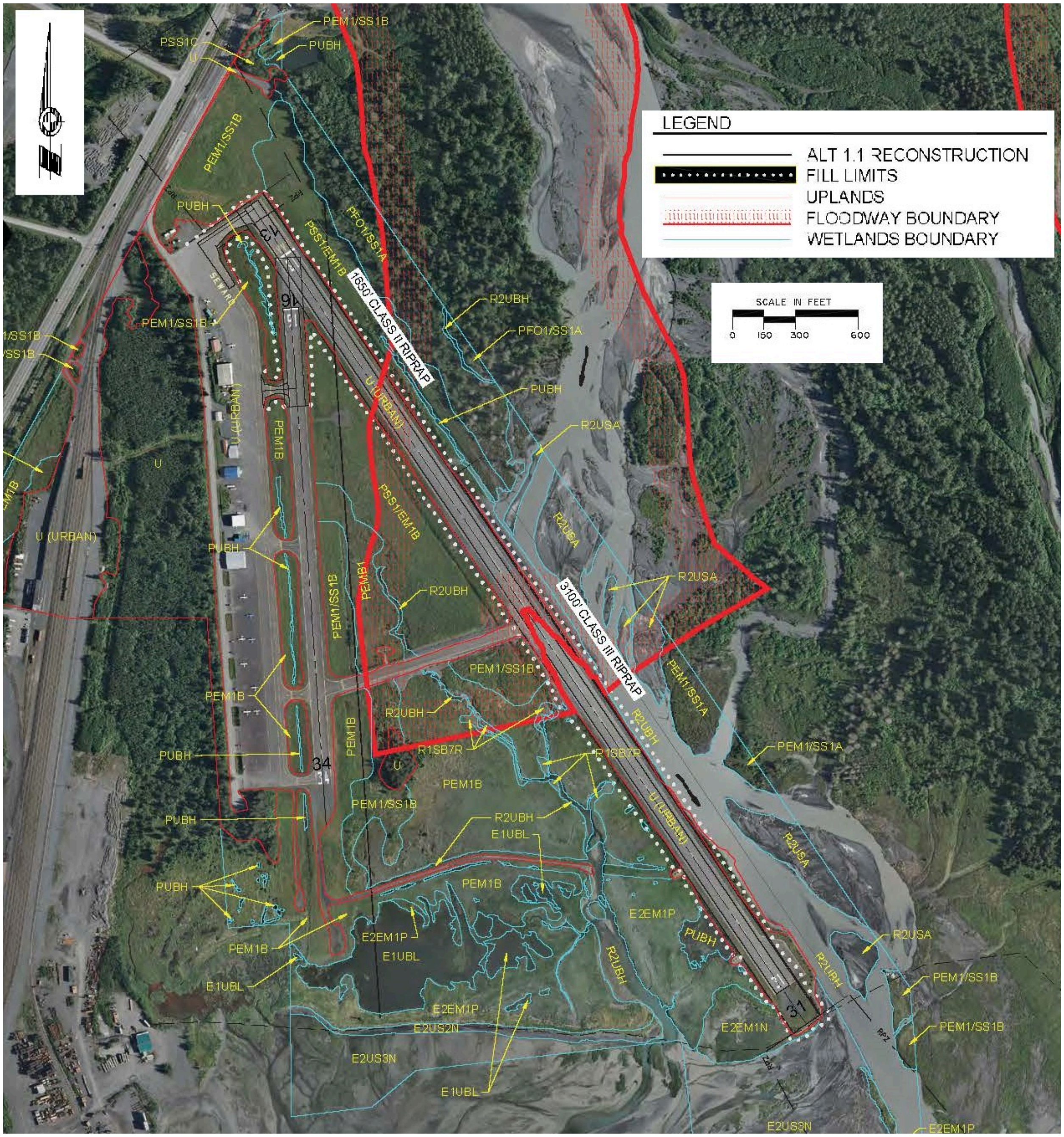

Figure 4 - Alternative 1.1

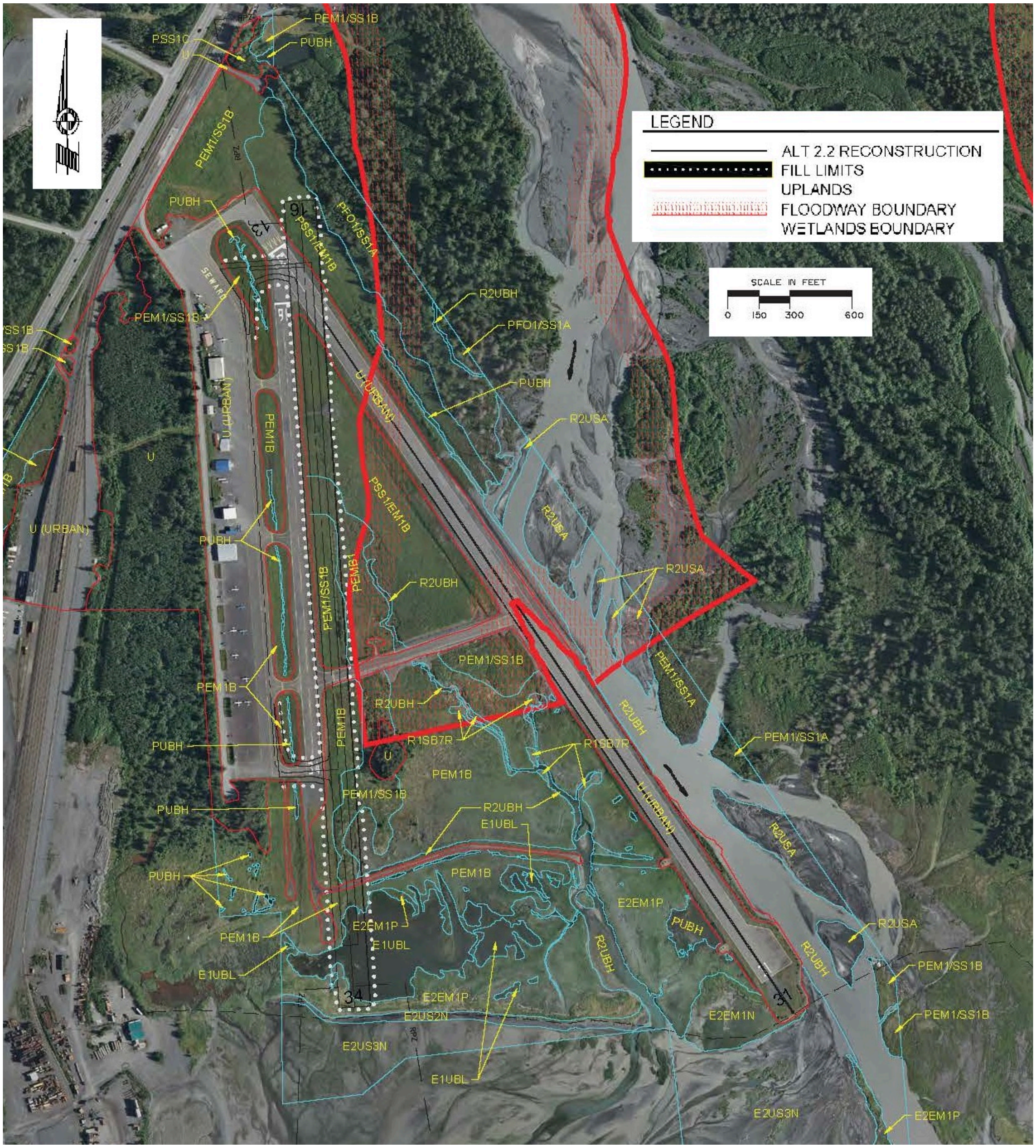

Figure 5 - Alternative 2.2

6.14.2 Floodplains

DOT&PF completed a flood study for the proposed project, which is available for agency review. Alternative 1.1 would require placement of fill within the regulatory floodway, as well as the floodplain, due to construction of the raised runway. Increases to the base flood elevation (BFE) by as much as 4 feet would occur in some areas. This encroachment and subsequent rise in the base flood elevation would result in a backing up of floodwaters onto private properties along the Resurrection River. An additional estimated 159 acres of land would be subject to flooding during a 100-year storm event while approximately 50 acres of land (west of the runway, mostly airport property) would be placed out of the existing floodplain. See Figures 6 and 7. The selection of Alternative 1.1 would likely require modifications to the effective FIRM and Floodway map. This would require a Letter of Map Revision (LOMR).

Fill for Alternative 2.2 would fall within the floodplain, but outside the regulatory floodway. Alternative 2.2 would result in a BFE increase of less than 1 foot. The FIRM and Floodway map would not need to be modified for this alternative. Alternative 2.2 would result in minor flood increases to an additional 22 acres of land while reducing flood impacts to 44 acres of land currently within the 100-year floodplain. See Figure 8.

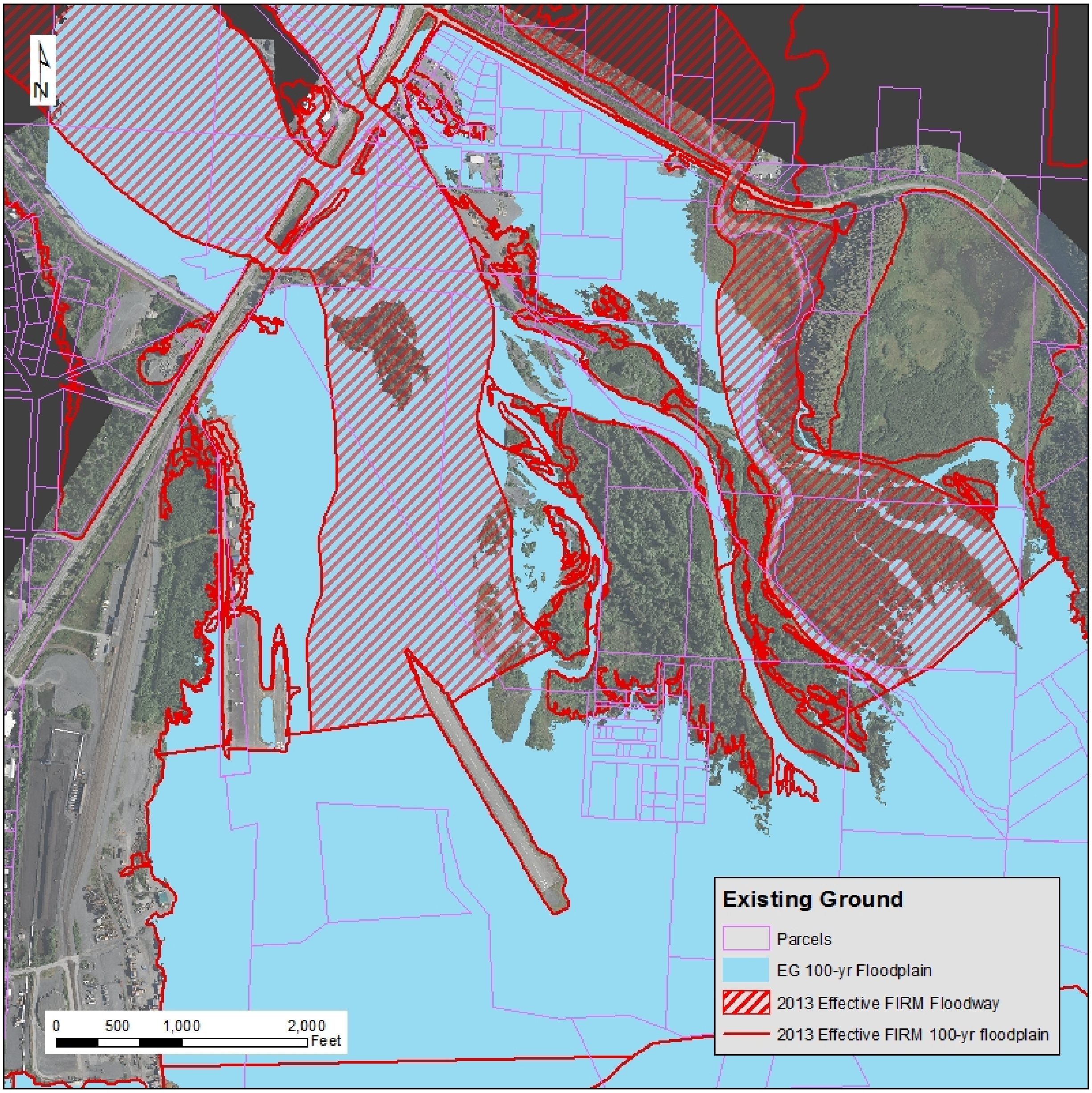

Figure 6 – 100-year flood map for Existing Conditions

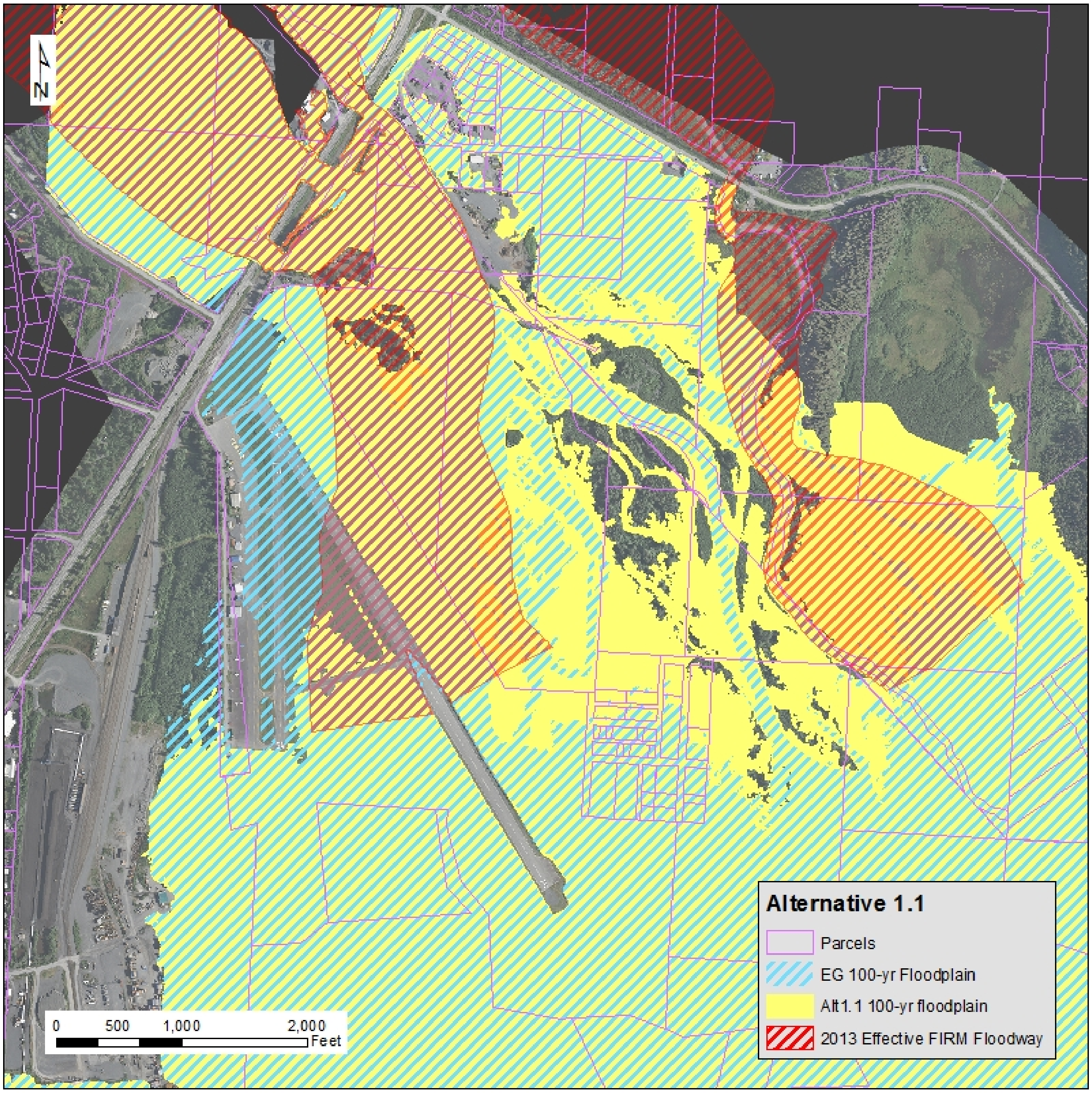

Figure 7 – 100-year flood map for Alternative 1.1

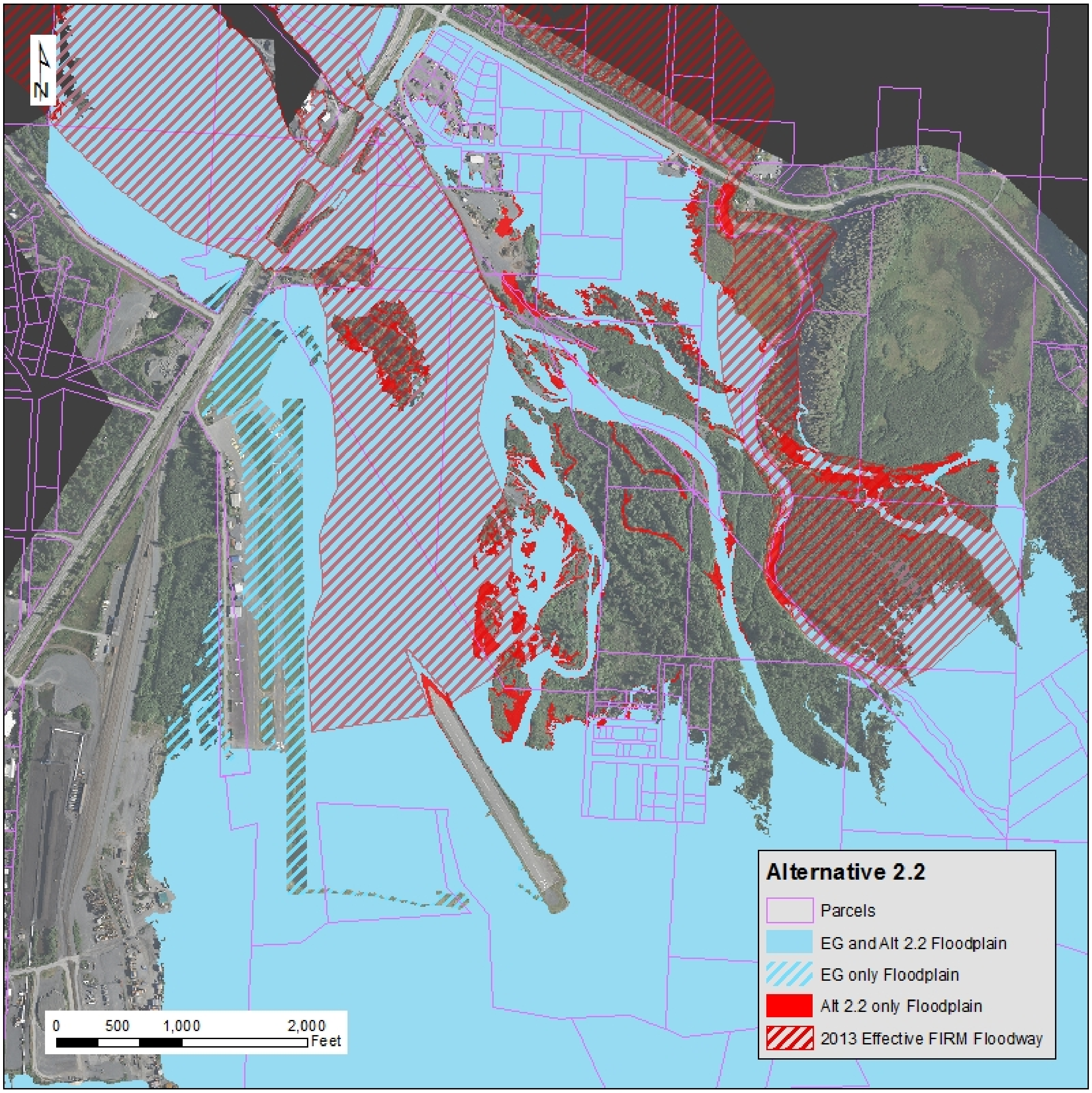

Figure 8 – 100-year flood map for Alternative 2.2

6.14.3 Surface Waters

Water quality degradation during construction may result from sedimentation of storm water runoff. Alternative 1.1 would require in-water work to provide increased armoring of the riverbank, and to provide appropriate embankment for the increased runway height. This may result in a temporary increase in turbidity. These impacts are anticipated to be mitigated by the use of BMPs, and implementation of a Storm Water Pollution Prevention Plan in accordance with the Alaska Pollutant Discharge Elimination System (APDES) Construction General Permit (CGP). There is no other pollutant input anticipated during construction.

There are five potential receiving water bodies within the study area, which are shown in Table 19 below. None of these receiving waters has been labeled as impaired. Alternative 1.1

is anticipated to affect the Resurrection River and potentially Airport Creek depending on the extent of Airport embankment needed to raise Runway 13/31. Alternative 2.2 could impact Unnamed stream 231-30-10075 with the relocation of Runway 16/34. Resurrection Bay is not anticipated to be directly affected by either Alternative but Section 6.4 identifies possible impacts to coastal resources associated with Alternative 2.2.

Table 19 – Anadromous Fish Streams in Project Area

Stream Name	AWC Code	Location	Anadromous Species and Use
Airport Creek	231-30-10080-2003	East side of the airport and adjacent to Runway 13/31	Spawning habitat for pink salmon
Unnamed anadromous fish stream	231-30-10075	Southern end of the airport between Runway 16/34 and Runway 13/31	Spawning habitat for pink salmon
Unnamed anadromous fish stream	231-30-10080-2017	East of the airport and Runway 13/31	Rearing habitat for coho salmon Spawning and rearing habitat for sockeye salmon
Resurrection River	231-30-10080	East of the airport	Spawning habitat for chum salmon Spawning and rearing habitat for Coho salmon Spawning habitat for pink salmon Spawning habitat for eulachon Chinook and sockeye salmon present
Resurrection Bay	N/A	South of the airport	Flathead sole present Pacific cod present Walleye pollock present All 5 species of Pacific salmon present

6.14.4 Ground Water

A review of the ADEC Drinking Water Protection Mapper on December 15, 2016 revealed many groundwater sources, and associated drinking water protection areas, established along the project corridor. The proposed project is not anticipated to impact local aquifers or established drinking water sources.

6.14.5 Wild and Scenic Rivers

No Wild and Scenic Rivers are located within or near the proposed project area.

6.15 Agency Coordination

An agency scoping letter was sent to State and Federal agencies on January 24, 2017. An agency scoping meeting was held on March 2, 2017 to initiate the NEPA process.

6.16 Public Coordination

The following sections highlight public coordination efforts undertaken for this project. Copies of meeting summaries, newsletters, mailing list, and phone logs are available in Appendix C.

6.16.1 Public Open Houses

Two open house style public meetings were held during the project scoping effort. More than thirty-three people attended the first open house on September 11, 2014 from 4:00 pm to 7:00 pm at the K.M Rae Marine Education Building in Seward. The goal of the public meeting was to provide information about the project and solicit initial thoughts, ideas, and comments. Meeting materials presented included project overview, details, current findings, schedule, and request for public comments. Seven comment sheets were completed during the meeting, and additional verbal and written comments were received after the meeting. An article summarizing the meeting was published in The Seward Phoenix Log on September 18, 2014.

More than twenty-two people attended the second public open house on April 20, 2016 from 5:00 pm to 7:30 pm at the K.M Rae Marine Education Building in Seward. During the open house, information about the process to date; aviation demands, hydrology, and funding challenges; alternative evaluation processes; and viable alternatives was provided. Alternative 2.2 was presented as the engineering preferred alternative. One comment sheet was received immediately following the meeting, one was submitted before the meeting, and several were submitted following the meeting. A Seward City News article summarizing the meeting was published on May 05, 2016. Copies of meeting materials for both public meetings including notes and comment sheets can be found in Appendix C1.

6.16.2 Stakeholder Working Group Meetings

A stakeholder working group (SWG) was formed and three meetings were held.

The first meeting was held on November 19, 2014 from 11:30 am to 2:00 pm at the Seward Community Library. The meeting included representatives from ARRC, the City of Seward, Civil Air Patrol, Kenai Peninsula Borough (KPB) Seward/Bear Creek Flood Service Area, leaseholders, Federal Aviation Administration (FAA), DOT&PF Central Region Aviation Design, DOT&PF Maintenance and Operations, and the consulting team. The goal of the meeting was to introduce the project process, establish the SWG's role, and reach an agreement on the draft of the "Aviation Activity & Facility Requirements" Technical Memorandum.

The second SWG meeting was held on July 21, 2015 from 11:00 am to 12:00 pm by teleconference. This meeting included representatives from ARRC, the City of Seward, Civil Air Patrol, KPB Seward/Bear Creek Flood Service Area, General Aviation (lease holder), FAA, DOT&PF Central Region Aviation Design, DOT&PF Maintenance and Operations, and the consulting team. The goal of the meeting was to discuss the project's status, address any questions, and reach a consensus on the final "Forecast of Aviation Activity & Facility Requirements" Technical Memorandum.

The third SWG meeting was held on April 20, 2016 from 1:30 pm to 3:45 pm at the K.M. Rae Marine Education Building in Seward. This meeting included representatives from ARRC, the City of Seward, KPB Seward/Bear Creek Flood Service Area, FAA, DOT&PF Central Region Aviation Design, and the consulting team. Representatives from Civil Air Patrol, General Aviation (lease holder), and DOT&PF Maintenance and Operations were not in attendance. The goal of the meeting was to review the status of the project; present the results of the Hydrology Report; present alternatives developed to address identified issues and needs; present the advantages and disadvantages associated with each alternative;

gather input on alternatives and their advantages and disadvantages; and gather input from SWG members on how to evaluate alternatives. Alternative 2.2 was presented as the engineered preferred alternative. Copies of SWG meeting materials including notes and comment sheets can be found in Appendix C2.

6.17 Environmental Assessment

Based on the preliminary scoping completed for this project, an Environmental Assessment will be required to comply with NEPA. The following is a list of work planned to complete the environmental document.

- Agency scoping meeting
- Prepare new EA document
- Permit preparation
- Further field studies as needed

6.17.1 Anticipated Permits and Authorizations

This project may require the following permits:

- APDES CGP for storm water discharge
- ADF&G Fish Habitat Permit
- ADNR Land Use Permit
- USACE Section 404 Permit
- KPB Multi-agency Permit
- KPB Floodplain Development Permit

APPENDIX A

Forecast and Facility Requirements Information

Table of Contents

FAA Terminal Area Forecast: National Forecast 2007 (1) — Enplanements

LOCID: SWD — SEWARD

Year	F	Air Carrier	Air Taxi	Commuter	US Flag	Foreign Flag	Total International Enpl.	Total Enplanements
1976		0	30	0	0	0	0	0
1977		0	0	0	0	0	0	0
1978		0	0	0	0	0	0	0
1979		0	0	1,172	0	0	0	1,172
1980		0	4,474	26	0	0	0	26
1981		11	4,500	111	0	0	0	122
1982		11	25	293	0	0	0	304
1983		0	13	423	0	0	0	423
1984		0	203	489	0	0	0	489
1985		0	5	514	0	0	0	514
1986		0	10	1,117	0	0	0	1,117
1987		0	4	924	0	0	0	924
1988		0	279	1,091	0	0	0	1,091
1989		0	600	1,877	0	0	0	1,877
1990		0	65	2,218	0	0	0	2,218
1991		0	0	598	0	0	0	598
1992		0	0	1,073	0	0	0	1,073
1993		0	0	127	0	0	0	127
1994		0	0	1,073	0	0	0	1,073
1995		0	0	587	0	0	0	587
1996		0	0	846	0	0	0	846
1997		0	0	1,373	0	0	0	1,373
1998		173	0	1,158	0	0	0	1,331
1999		0	0	583	0	0	0	583
2000		0	0	512	0	0	0	512
2001		0	0	338	0	0	0	338
2002		0	0	15	0	0	0	15
2003		0	0	0	0	0	0	0
2004		0	0	20	0	0	0	20
2005		0	0	1	0	0	0	1
2006		0	0	6	0	0	0	6
2007	*	0	0	6	0	0	0	6
2008	*	0	0	6	0	0	0	6
2009	*	0	0	6	0	0	0	6
2010	*	0	0	6	0	0	0	6
2011	*	0	0	6	0	0	0	6
2012	*	0	0	6	0	0	0	6
2013	*	0	0	6	0	0	0	6
2014	*	0	0	6	0	0	0	6

2015	*	0	0	6	0	0	0	6
2016	*	0	0	6	0	0	0	6
2017	*	0	0	6	0	0	0	6
2018	*	0	0	6	0	0	0	6
2019	*	0	0	6	0	0	0	6
2020	*	0	0	6	0	0	0	6
2021	*	0	0	6	0	0	0	6
2022	*	0	0	6	0	0	0	6
2023	*	0	0	6	0	0	0	6
2024	*	0	0	6	0	0	0	6
2025	*	0	0	6	0	0	0	6

Report created 5/13/2015 19:23

FAA Terminal Area Forecast: National Forecast 2007 (1) — Airport Operations

LOCID: SWD — SEWARD

Year	F	Itn Air Carrier	Itn Air Taxi	Itn GA	Itn Mil	Local GA	Local Mil	Total Airport Ops
1976		0	2,500	4,000	5	1,000	5	7,510
1977		0	2,500	4,000	5	1,000	5	7,510
1978		0	2,500	4,000	5	1,000	5	7,510
1979		0	4,500	4,240	5	1,060	5	9,810
1980		0	4,500	4,000	5	2,000	5	10,510
1981		6	4,500	4,000	5	2,000	5	10,516
1982		6	4,500	4,000	5	2,000	5	10,516
1983		0	4,500	4,000	5	2,000	5	10,510
1984		0	4,500	4,000	5	2,000	5	10,510
1985		0	4,500	4,000	10	2,000	0	10,510
1986		0	4,500	4,000	10	2,000	0	10,510
1987		0	4,500	4,000	10	2,000	0	10,510
1988		0	4,782	4,103	10	2,052	0	10,947
1989		0	4,500	4,000	10	2,000	0	10,510
1990		0	4,500	4,000	10	2,000	0	10,510
1991		0	4,500	4,000	10	2,000	0	10,510
1992		0	4,500	4,000	10	2,000	0	10,510
1993		0	0	0	0	0	0	0
1994		0	4,500	4,000	10	2,000	0	10,510
1995		0	4,500	4,000	10	2,000	0	10,510
1996		0	4,500	4,000	10	2,000	0	10,510
1997		0	4,500	4,000	10	2,000	0	10,510
1998		0	4,500	4,000	10	2,000	0	10,510
1999		0	4,500	4,000	10	2,000	0	10,510
2000		0	4,500	4,000	10	2,000	0	10,510
2001		0	4,500	4,000	10	2,000	0	10,510
2002		0	4,500	4,000	10	2,000	0	10,510
2003		0	4,500	4,000	10	2,000	0	10,510
2004		0	4,500	4,000	10	2,000	0	10,510
2005		0	4,500	4,000	10	2,000	0	10,510
2006		0	4,500	4,000	10	2,000	0	10,510
2007	*	0	4,500	4,000	10	2,000	0	10,510
2008	*	0	4,500	4,000	10	2,000	0	10,510
2009	*	0	4,500	4,000	10	2,000	0	10,510
2010	*	0	4,500	4,000	10	2,000	0	10,510
2011	*	0	4,500	4,000	10	2,000	0	10,510
2012	*	0	4,500	4,000	10	2,000	0	10,510
2013	*	0	4,500	4,000	10	2,000	0	10,510
2014	*	0	4,500	4,000	10	2,000	0	10,510

A3

2015	*	0	4,500	4,000	10	2,000	0	10,510
2016	*	0	4,500	4,000	10	2,000	0	10,510
2017	*	0	4,500	4,000	10	2,000	0	10,510
2018	*	0	4,500	4,000	10	2,000	0	10,510
2019	*	0	4,500	4,000	10	2,000	0	10,510
2020	*	0	4,500	4,000	10	2,000	0	10,510
2021	*	0	4,500	4,000	10	2,000	0	10,510
2022	*	0	4,500	4,000	10	2,000	0	10,510
2023	*	0	4,500	4,000	10	2,000	0	10,510
2024	*	0	4,500	4,000	10	2,000	0	10,510
2025	*	0	4,500	4,000	10	2,000	0	10,510

Report created 5/13/2015 18:57

DEPARTURES_PERFORMED	PASSENGERS	FREIGHT	DISTANCE	UNIQUE_CARRIER_NAME	ORIGIN_CITY_NAME	DEST_CITY_NAME	YEAR	MONTH	AIRCRAFT_NAME
1	2	0	274	Grant Aviation	Seward, AK	King Salmon, AK	2012	6	Beech 200 Super Kingair
1	0	0	75	Grant Aviation	Seward, AK	Anchorage, AK	2012	6	Beech 200 Super Kingair
1	0	0	79	Homer Air	Seward, AK	Homer, AK	2012	8	Cessna C206/207/209/210 Stationair
1	1	0	93	Homer Air	Seward, AK	Seldovia, AK	2012	8	Cessna C206/207/209/210 Stationair
1	0	0	79	Smokey Bay Air Inc.	Seward, AK	Homer, AK	2012	10	Cessna C206/207/209/210 Stationair
1	2	0	274	Grant Aviation	King Salmon, AK	Seward, AK	2012	6	Beech 200 Super Kingair
1	1	0	75	Grant Aviation	Anchorage, AK	Seward, AK	2012	6	Beech 200 Super Kingair
1	0	0	79	Homer Air	Homer, AK	Seward, AK	2012	8	Cessna C206/207/209/210 Stationair
1	1	0	93	Homer Air	Seldovia, AK	Seward, AK	2012	8	Cessna C206/207/209/210 Stationair
1	1	0	79	Smokey Bay Air Inc.	Homer, AK	Seward, AK	2012	10	Cessna C206/207/209/210 Stationair
1	1	0	75	Iliamna Air Taxi	Seward, AK	Anchorage, AK	2011	6	Pilatus PC-12
2	8	0	79	Homer Air	Seward, AK	Homer, AK	2011	8	Cessna C206/207/209/210 Stationair
1	0	0	198	Island Air Service	Seward, AK	Kodiak, AK	2011	9	Piper PA-32 (Cherokee 6)
1	8	0	192	Iliamna Air Taxi	Iliamna, AK	Seward, AK	2011	6	Pilatus PC-12
1	5	0	200	Homer Air	Hallo Bay, AK	Seward, AK	2011	8	Cessna C206/207/209/210 Stationair
1	0	0	79	Homer Air	Homer, AK	Seward, AK	2011	8	Cessna C206/207/209/210 Stationair
1	2	0	198	Island Air Service	Kodiak, AK	Seward, AK	2011	9	Piper PA-32 (Cherokee 6)
1	0	0	100	Homer Air	Seward, AK	Port Graham, AK	2010	6	Cessna C206/207/209/210 Stationair
1	0	0	79	Homer Air	Seward, AK	Homer, AK	2010	8	Cessna C206/207/209/210 Stationair
1	6	0	75	Grant Aviation	Anchorage, AK	Seward, AK	2010	7	Beech 200 Super Kingair
1	2	0	79	Homer Air	Homer, AK	Seward, AK	2010	6	Cessna C206/207/209/210 Stationair
1	1	0	79	Homer Air	Homer, AK	Seward, AK	2010	8	Cessna C206/207/209/210 Stationair
2	1	0	79	Homer Air	Seward, AK	Homer, AK	2009	8	Cessna C206/207/209/210 Stationair
2	5	500	79	Homer Air	Homer, AK	Seward, AK	2009	8	Cessna C206/207/209/210 Stationair
1	0	0	75	Alaska Central Express	Seward, AK	Anchorage, AK	2008	9	Beech 1900 A/B/C/D
1	0	0	75	Era Aviation	Seward, AK	Anchorage, AK	2008	4	Beech 1900 A/B/C/D
1	0	0	75	Alaska Central Express	Seward, AK	Anchorage, AK	2008	6	Beech 1900 A/B/C/D
1	0	0	328	Warbelow	Seward, AK	Fairbanks, AK	2008	8	Cessna 172 Skyhawk
2	22	0	328	Frontier Flying Service	Seward, AK	Fairbanks, AK	2008	8	Beech 1900 A/B/C/D
1	0	0	75	Alaska Central Express	Anchorage, AK	Seward, AK	2008	6	Beech 1900 A/B/C/D
1	0	0	75	Alaska Central Express	Anchorage, AK	Seward, AK	2008	9	Beech 1900 A/B/C/D
1	3	0	79	Era Aviation	Homer, AK	Seward, AK	2008	4	Beech 1900 A/B/C/D
1	2	0	153	Warbelow	Talkeetna, AK	Seward, AK	2008	8	Cessna 172 Skyhawk
2	23	0	328	Frontier Flying Service	Fairbanks, AK	Seward, AK	2008	8	Beech 1900 A/B/C/D
1	0	0	198	Island Air Service	Seward, AK	Kodiak, AK	2007	8	Cessna C206/207/209/210 Stationair
1	9	0	328	Wright Air Service	Seward, AK	Fairbanks, AK	2007	7	Cessna 208 Caravan
1	17	0	328	Frontier Flying Service	Seward, AK	Fairbanks, AK	2007	7	Beech 1900 A/B/C/D
1	9	0	328	Wright Air Service	Fairbanks, AK	Seward, AK	2007	7	Cessna 208 Caravan
1	17	0	328	Frontier Flying Service	Fairbanks, AK	Seward, AK	2007	7	Beech 1900 A/B/C/D
1	2	0	198	Island Air Service	Kodiak, AK	Seward, AK	2007	8	Cessna C206/207/209/210 Stationair

SEWARD CITY NEWS
read it, write it
Monday, June 12, 2017

BUSINESS, CITY OF SEWARD

Seward Ship's Drydock negotiates sale

January 31, 2014 1:11 pm by Heidi Zemach

Tustumena at Seward Shipyard in 2013. Heidi Zemach file photo

SEWARD, Alaska – Jim Pruitt, the owner of Seward Ship's Drydock at Seward Marine Industrial Center, (SMIC), has signed a "letter of intent" to sell the assets of the shipyard company to Vigor Industrial. Vigor, a Seattle-based firm with shipyards in Washington, Oregon and Alaska works with the U.S. Navy and Coast Guard on large ships that ply the Pacific Northwest, the Polar Regions, and worldwide, and is also working with the Coast Guard to return American heavy icebreakers to the Arctic and Antarctic, and to build faster, more efficient patrol boats.

The two companies are currently negotiating the terms of the potential sale, and expect it be finalized after completing environmental, financial and business due diligence and after Seward Ship's Drydock, Vigor and the City of Seward reach a final agreement on certain details, according to a press release by Vigor Industrial.

Seward Ship's Drydock has operated the shipyard and drydock facility on land it leases from the City of Seward. Its assets have grown considerably over time, and in 2012, the city extended its ground lease with Seward Ships to 2040 to make it more attractive to potential investors.

Under the terms of the tentative deal, the Seward shipyard would join Vigor as a subsidiary of the company's Vigor Alaska subsidiary.


Seward Ships file photo by Heidi Zemach.

"In order to continue to grow and expand the business, additional capital was required, and this, together with a desire to further diversify my financial holdings, made this an opportune time to seek a buyer for the business," Pruitt said, in the press release. "Vigor Industrial has an impressive vision for Seward Ship's Drydock and I am confident that I have made a decision which will leave the future of the business, and its employees in safe hands," he said.

"This is an exciting opportunity for Vigor, our customers, our employees and the workforce here in Seward," said Frank Foti,

president and CEO of Vigor Industrial. "Vigor continually strives to improve our service to the maritime industry, and the purchase of this strategically located shipyard will expand our ability to provide the services our customer's need, when they need them, where they need them."

The move was part of Vigor's larger plan to improve the company's service offerings in Alaska for existing customers in the fishing, oil and gas and marine transportation sectors as well as increase overall capacity to meet expected increases in demand from arctic drilling and the revitalization of the commercial fishing fleets in the area, Foti said.

"Beyond strengthening our business, we look forward to providing even greater family-wage job opportunities for Seward's current workforce and Alaskans overall," Foti said. The purchase will bring the strength of Vigor's physical, financial and human capital to bear on the yard, which will empower the yard to land more projects and larger-scale projects, translating to more work and sustainable employment for Alaska residents. In addition, Foti said, Vigor will leverage its existing strong public/private partnerships in Alaska to maximize opportunities for the Seward yard.

The city has been working steadily to build up SMIC, and its ship-related businesses over the past year or so. It is planning to lobby the State of Alaska to provide the final $7.9 million it estimates will be needed to enable construction project to begin on a new protective breakwater along with harbor dredging at the industrial center, which was not included in the Alaska Governor Sean Parnell's Capital Budget. The city also plans to build a new, larger dock facility at SMIC to accommodate the new research vessel Sikuliak, home-porting Coastal Villages fishing fleet, and other vessels such as those involved in Arctic exploration and drilling.

A little background from Seward Ship Drydock's website: Seward Ship's opened in 1973 to answer to the growing need for vessel repair services close to the fishing grounds. By 1974, the demand and the increasing work load led to the construction of the current home for Seward Ship's Chandlery in the Leirer Industrial Park. In 1979 Seward Ship's leased and rebuilt a 300 ton marine railway facility at Lowell Point. This facility operated until 1985, when Seward Ship's began drydocking and servicing vessels at the Seward Marine Industrial Center, utilizing the new 5,000 ton Syncro-Lift. In 1988 Seward Ship's leased two acres at the Seward Marine Industrial Center, the present site of Seward Ship's Drydock, Inc. operations."

Reported by Heidi Zemach.

Author: Heidi Zemach

Heidi Zemach is a staff writer for Seward City News.

2 Comments

betsy

February 1, 2014 at 2:46 am

This ought to be more than interesting. Seward Ship has been much less than a model local player; shorting Seward city treasurers hundreds of thousands in tax when the city's coffers were in dire straits. There are still huge toxic surface water runoff issues; along with airborne aerosol solvents, particulates and hundreds of bags solid waste items blown downwind. The prospective buyer produced the Kulluk floating drill rig, and the emission plagued drill ship and tow rigs also. Let's hope the city fathers and mothers vet this buyer more responsibly before granting a 40 year extended lease that might restrict access to the popular Fourth of July Creek recreation area; and worse yet, continue the legacy of local pollution. This area is a vital recreational resource; and very popular with longtime Seward local citizens whom have long contributed faithfully to the city"s well being.

fed up

February 2, 2014 at 12:06 pm

Shorting Seward city treasures–I think not!–the frivolous millions of dollars and years the city of Seward has spent to extort from The Seward shipyards- and failed because you had no legal leg to stand -the only ones that have profited were the attorneys–The city of Seward would cut off it's nose to spite it's face—This is good for the economy of Seward but God forbid City of Seward leaders can see past their own agenda!

VIGOR
ALASKA

January 19, 2015
Mr. Ron Long, Assistant Manager
City of Seward
P.O. Box 167
Seward, Alaska 9966

Re: Seward Airport Rehabilitation and Upgrade Project

Dear Mr. Long:

As the City of Seward's lease holder and operator of the Seward Shipyard, I am writing in support of the Alaska Department of Public Facility's (ADOTPF) Seward Airport Rehabilitation and Upgrade Project (Airport Upgrade).

Vigor Alaska is committed to the expansion and improvement of the marine industrial support sector in Seward. Shipyards rely on timely and affordable transportation and logistics to be competitive in the today's economics.

While the one hundred and twenty five mile drive from Anchorage to Seward Highway offers unmatched views of Alaska in all her beauty, the two and one half hour drive each way creates a competitive disadvantage to the Seward Shipyard. Seward's location on Resurrection Bay is ideal for access by the many marine vessels operating in the region serving Valdez, Cook Inlet, the Aleutian Chain and western Alaska. Seward's location as it relates to road access to Anchorage , which is Alaska's major shipping and logistics center, is problematic. Aside from the five hour round trip drive, the Seward Highway is hazardous in the winter and subject to closure from avalanche hazard.

As operators of one of Alaska's largest shipyards, we depend on a wide array of production personnel, contractors and vendor technicians to accomplish complex and high volume vessel repair, maintenance and conversion work on time and on budget.

Complex ship repair work often requires specialized production personnel for critical short term repair processes. Vigor Alaska routinely dispatches production specialists from our six other shipyard locations in Oregon, Washington, and Ketchikan to Seward to support peaks in labor demand. Vendor technical personnel are routinely required for major equipment installation and service.

US Coast Guard (USCG) inspection and safety personnel stationed Anchorage currently require at least a full day to accomplish critical inspections of ship repair work that often require an hour or less to complete. Critical ship repair production activities cannot proceed without USCG inspection and approval. Inspection delays create cascading financial impacts for both marine vessel operators facing rigid schedule requirements and for Vigor Alaska facing strict contract requirements for timely completion of vessel repair work.

The airport upgrade project will enable scheduled air service between Seward to Anchorage and other major Alaska cities facilitating the growth improvement of the states emerging marine industrial support sector. Vigor Alaska supports the Seward airport project to provide a year round safe, affordable, and efficient, transportation link for our employees and the many technical personnel required to conduct competitive ship repair and maintenance activities at the Seward Shipyard.

Sincerely:

Doug Ward

Doug Ward
Director of Shipyard Development

3801 N Tongass, P.O. Box 9470, Ketchikan, AK 99901
Phone 907.225.7199 / fax 907.247.7199 / vigoralaska.com

Shell Exploration & Production Company
3601 C Street, Suite 1000
Anchorage, Alaska 99503
Tel 907.770.3700
Fax 907.646.7135
Internet http://www.shell.us/alaska

February 9, 2015

Mr. Ron Long, Assistant Manager
City of Seward
P.O. Box 167
Seward, Alaska 99664
Re: Seward Airport Rehabilitation and Upgrade Project

Dear Mr. Long:

I am writing in support of the Alaska Department of Transportation & Public Facilities' (ADOTPF) Seward Airport Rehabilitation and Upgrade Project.

Shell Alaska recognizes significant opportunity with the Seward Airport Rehabilitation and Upgrade Project. Given the dynamic nature of our operations, we are frequently in search of viable marine ports and associated services that will enhance our ability to operate exceptionally well while engaging in Outer Continental Shelf (OCS) energy exploration and development. To that end, Seward's deep water port is an attractive option for consideration.

During our 2012 operations, Shell Alaska utilized Seward to support our fleet and one of our drilling units. Road transportation was utilized to support these assets. An upgrade to the existing airport would permit Shell to factor charter air transportation of material and personnel more aggressively than in the past to support our current operations while introducing a strong planning factor for future operations. Moreover, with the expansion of the marine industry in Seward to include Vigor, we strongly believe that demand for significant and reliable air services will only increase, not decrease.

In closing, Shell Alaska supports the Seward airport project to provide a year round safe, affordable, and efficient transportation link for our employees and the many technical personnel required to conduct ship repair and maintenance activities at the Seward Shipyard.

Sincerely,

M D Guadag

Mark Guadagnini
Vice President, Arctic Maritime & Logistics
Shell Exploration and Production Company

Ken Risse

From: Robert.D.Hornick@uscg.mil on behalf of Hornick, Robert D LT <Robert.D.Hornick@uscg.mil>
Sent: Thursday, August 14, 2014 12:18 PM
To: Ken Risse
Cc: Coulter, Nathan CDR
Subject: RE: PDC Engineering Facility Requirement - Seward

I do not know who does the pavement strength tests or who funds them. The LCN report I was stating came from an Air Force report. We just go by what is published in the AK aviation supplement.

As far as the use of an airfield during a mass casualty or natural disaster, if the runway is still usable we would/can use the C130 as an air ambulance to get people to higher level of care quicker.

As far as the chain of command, we normally get our direction through our district office in Juneau Alaska.

The H60 / H65 helicopters have used Seward before, and usually they only require gas. As stated earlier the C130's have not been there in a while. I will not say we will never use Seward for SAR, as we never know what situation will present itself. Having Seward available for use by C130's only allows for increased flexibility/capability to respond.

If Seward were rated for C130 use we would use it training pilots to land on shorter/narrower runways. Currently the only other field we use that is close to Sewards dimensions is Dutch Harbor and that is a 2 hr flight. You would probably see weekly flights stopping by for touch and go's. C130's would need no other services.

Let me know if you have any more questions.

LT Robert Hornick
C-130 Assistant Operations Officer
Robert.D.Hornick@uscg.mil
(W) 907-487-5586
(C) 858-752-3103

-----Original Message-----
From: prvs=296a1c91b=KenRisse@pdceng.com [mailto:prvs=296a1c91b=KenRisse@pdceng.com] On Behalf Of Ken Risse
Sent: Thursday, August 14, 2014 10:12 AM
To: Hornick, Robert D LT
Cc: Coulter, Nathan CDR
Subject: RE: PDC Engineering Facility Requirement - Seward

LT. Hornick,

Thanks for the reply. Can you tell me more about the way the Coast Guard would handle mass casualties or medical evacuations? For instance, if there were an accident with a fishing boat, cruise ship or other vessel with a dozen injuries, would the Coast Guard C-130 act as a medical ambulance moving mass casualties to hospitals in Anchorage or other cities? If there were a natural disaster, not at sea, such as an earthquake, fire or flood, would the Coast Guard respond under FEMA direction?

For the pavement strength, you mentioned that it previously had an LCN of 14. Do you go by the published pavement strength in the 5010 records (currently not available), or does the military test pavement strength at airports it plans to use?

If there were no pavement strength limitations/restrictions, how many annual C-130 operations would you expect at Seward in a typical year?

Would Coast Guard search and rescue operations ever be based out of Seward? If so, what airport facilities are needed?

Thanks for your help.

Ken Risse, PE, Senior Associate
Civil Engineer

PDC Inc. Engineers
Planning Design Construction

1028 Aurora Drive | Fairbanks, Alaska 99709 v 907.452.1414 | f 907.456.2707 | www.pdceng.com
"Transforming Challenges into Solutions"

-----Original Message-----
From: Robert.D.Hornick@uscg.mil [mailto:Robert.D.Hornick@uscg.mil]
Sent: Wednesday, August 13, 2014 3:33 PM
To: Ken Risse
Cc: Coulter, Nathan CDR
Subject: RE: PDC Engineering Facility Requirement - Seward

Ken,
Understand you are inquiring about Coast Guard operations at the Seward airport with regards to C130 operations and impacts.
Since I have been here (2012) we have not used Seward due to the fact that it is no longer tested for the C130 bearing capacity. From what I have been told we used to operate there when it was certified for our weight.

The real impact for Coast Guard operations is for expedient planning in case of mass casualty or Medical Evacuation that would allow a quicker response via C130 than an H60. Additionally, if an H60 needed fuel and a fuel provider was not available at the airport the C130 could provide fuel. With the bearing capacity as it stands we would need a DOT waiver, which could take some time. The last report, before the 12,500 NOTAM restriction was established, is that the main Runway has an LCN of 14 equating to a max gross C130 weight of 100,000 lbs. With a runway length of 4500 we can normally operate at about 120,000 lbs, allowing enough fuel and gear to respond to the majority of situations.

Let me know if you have any questions.

LT Robert Hornick
C-130 Assistant Operations Officer
Robert.D.Hornick@uscg.mil
(W) 907-487-5586
(C) 858-752-3103

-----Original Message-----
From: Vojtech, Zachary R LT
Sent: Wednesday, August 13, 2014 2:58 PM
To: Hornick, Robert D LT
Cc: DeAngelo, Daniel J LT; Coulter, Nathan CDR
Subject: PDC Engineering Facility Requirement - Seward

Bob,

I received a phone call from Ken Risse who works for PDC Consulting Engineers, contract work with Dept of Transportation. They are putting together a Facility Requirement Chapter for the Seward airport and would like to know the importance of Seward in regards to the Coast Guard. Specifically, they are deciding whether or not the DOT should shorten the runway or change the weight capability, but would like to know impacts to our C-130 operations.

Ken Risse's phone number is 907-452-1414 and email is kenrisse@pdceng.com.

He will be completing this chapter by Friday, and would like to add our input to it before then.

Thank you.

Zach

LT Zach Vojtech
Air Station Kodiak
w: (907)487-5887

Date/Time NEW ENTRY	Contact/Phone	Disc.	Comments
2/6/15 10:00 am By Ken Risse	Kyle Christianson, FAA 271-5187	CE	A meeting with Kyle Christianson and Dennis Perry (Seward working group) was held at the 3rd floor, Federal Building, 222 W 7th Ave, Anchorage, AK. Royce and I attended by teleconference. Attendees: Dennis Perry – Seward Working Group Barbara Beaton – DOT Project Manager Joy Vaughn – DOT Consultant Coordinator Royce Conlon – PDC Project Manager Ken Risse – PDC Civil Designer Kyle Christianson – FAA Flight Procedures Office Dennis spoke about his experience flying in and out of Seward. He operated Bear Lake Air Service for 15 years. He now runs a B&B and takes hunters out to Montague Island. Getting off of the island in the winter depends on weather, tides, and daylight. He estimated the chance of getting off the island any given day in November is about 50%, in December it is about 20%. Dennis noted that Seward is the second most popular tourist destination in Alaska, next to Denali. Seward used to have daily service from FS Air. It was subsidized by the DOT. Floyd Salts would always be able to fly out of Seward, but could not always get in. When he died, his wife did not have a grasp of what worked in Seward and moved the operation to Anchorage. Often they would launch for Seward and then cancel due to weather. Eventually DOT withdrew the subsidy. Dennis described one of his most memorable flights returning to Seward with some hunters. It was a bad situation where the weather closed in quickly and at altitude he was icing up, so he had to drop down and fly low. He ended up relying on his knowledge of where the Alaska Railroad 200' tall coal gantry was relative to the airport and made a landing shortly after passing that landmark. This was before the GPS instruments were as developed as they are now. Dennis now has synthetic vision, but said he is too old to do the (FAR Part) 135 work. Aeromed flys the RNAV approach. Large planes occasionally fly into Seward. Dennis has seen a 737 make an emergency landing. The Chinooks and C-130's use it occasionally. The airport also needs a place for the float planes. When the city built the dock, they took out a float plane ramp. Some planes on floats land near the beach when they cannot get to Bear Lake, and bob up and down with the tides. Overall Dennis felt extending the shorter runway was the best solution for the airport. Dennis said what they are looking for is an approach with a 500 foot decision height. (The current RNAV MDA is 2660'. Kyle said the published approach is based on a 200'/nautical mile climb rate per TERPs. They can publish a higher climb rate, but only if operators can assure the higher rate. The missed approach splays out so quickly, that it runs into terrain. More terrain comes into play with a lower descent point. A private approach could be developed as they have in Southeast Alaska, but it would not be published. Dennis noted that a lower minimum could help during times when the community is cut off due to avalanches. In the late 1990's Seward was cut off for 2 ½ weeks. Trucks with supplies had to be ferried from Whittier. The DC-6 and Otters did not fly until they had VFR weather. Bear Lake has had 572 inches

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			of snowfall.
			Kyle asked if they are trying to reduce the minimums of the north approach or add an approach from the south. Any procedures for Seward are controlled by terrain. Reducing the minimums may be done with special (non-public) procedures. With special procedures, every item must be addressed. The FAA has to determine that the special procedure has an equivalent level of safety. The proponent must show why it is just as safe. This might restrict the approach to only authorized users with training and proof of aircraft performance. This is no sure thing. The review board is in Washington DC, and meets every Thursday to evaluate specials. They are not likely to take risks, and with the mountainous terrain, they are likely to say no.
			Developing a special approach is expensive. If the FAA works on it, they need a reimbursable agreement. Kyle is the only FAA person that works on the approaches in Alaska, his backup is in Seattle. Another option is to find a private consultant to design the approach. They would have to follow the FAA-approved design procedure. Jeppeson is one contractor that designs approaches, Kyle knows of only one other one. It takes a long time to learn the system. They may be able to get a little bit lower (descent altitude), but they need to have good data points. Even if they could get down to 1500 feet, that is a good day in Seward.
			Kyle described the process for getting FAA to design a procedure. The FAA reimbursable agreement will be a minimum of $10,000 for development of an RNAV procedure; it costs a lot to flight check. To use a special procedure, the operators will have to request authorization and prove performance. Dennis felt Lifeflight might do this.
			Kyle said we need to be smart about how the approach is designed (to make it most useful to operators). He will be happy to discuss it further with Dennis, and gave him his card. Dennis said Tom George is interested in the Seward Airport, and has some ideas on the approaches. He will be meeting with Tom.
			Dennis said he is trying to get electricity hooked up and the city wants $50,000 for that. They told his neighbor (Lucky) it was $100,000 to get hooked up.
			Kyle and Dennis discussed the approaches into Valdez and Juneau and compared them to Seward.
			
			Barbara added the following notes from the teleconference:
			• Kyle discussed the idea of increasing the gradient for the existing approach. However a high percentage of operators need to sign an agreement that they can use a steeper gradient. Even with a steeper gradient, good minimums are not possible due to surrounding terrain. Lower minimums are not possible for a public approach using existing criteria.
			
			• A special approach would be expensive and would require the following:
			
			    • Hiring a private contractor to determine feasibility. One is not available in Alaska.
			    • A Reimbursable Agreement with FAA to cover their internal costs as well as a flight check. (About $10K)
			    • Discussion of what items need to be waived for the procedure to work.

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			• Review/approval by a group in the lower 48. The group is made of primarily of airline pilots. Kyle had a high level of confidence a private special approach could be approved. • For no cost, a public approach can be requested from the south. • A LP/LPV approach may be possible but only limited operators can use it. • Per Kyle, tweaking the runway alignments will not likely help with the existing approach. The airport is not aligned well with the valley. To align the airport will mean moving it to the middle of the river. • A public approach with a 2,400 ft runway may be supported by flight standards even though they like to have 3,200 ft. Joy added the note below: • Kyle said a public approach, if requested, would take the FAA 18 months to 2 years to establish assuming they don't have problems with "bad data points," which I took to mean data problems with the locations of obstacles.
11/5/2014 10:00 am By Ken Risse	Kyle Christianson, FAA 271-5187	CE	I called Kyle to discuss the approaches at Seward, and the possibility of reducing the minimums. He said the big problem at Seward is that it is surrounded on all fours sides by onerous terrain. The missed approach trapezoid expands so rapidly that no matter how the runway is oriented, it runs into the mountains. The only way to substantially reduce the minimums is with an RNP approach, which requires high cost equipment both on the ground and in the aircraft flying into the airport. Alaska Airlines uses these approached flying into Anchorage and Deadhorse. He did not think it would ever be feasible at Seward. The published approach was developed on best available information. If an aeronautical survey is done for Seward, the minimum altitude may go down a few feet. In summary, no significant improvements to the instrument approaches are expected.
8/27/2014 10:12 AM by Patrick Cotter	Dirk Bowen LifeFlight 907.903.5987	P	Dirk called me back to discuss LifeFlight's use of SWD. He said they use the King Air 200 for medevacs, and need at least 3,000' of runway. During the times the runway was flooded, they were unable to land – the crosswind is too short.
8/13/2014 10:03 AM by Ken Risse	Kodiak Coast Guard Air Station 907-487-5888 Menu Item 4	CE	I called the Kodiak Coast Guard to discuss their needs at Seward. Primarily they fly the H-60 helicopters into Seward and their primary need is fuel They have not flown any C-130s into Seward recently because of the weight restrictions. They will have someone from the C-130 contact me either by phone or email to discuss their facility needs.

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8/12/2014 4:32 PM by Royce Conlon	RAVN Air (formally ERA/Frontier) Jim Hajdukovich	P	I called Ravn Air to discuss current and potential operations into the Seward Airport. Bob Hajdukovich (CEO) was also in the background and project Jim with some answering to my questions. Is Ravn currently providing any service to Seward? Jim said only by Charter and without looking it up he would estimate only 2-3 times in the last 8 years. Those were for charters of groups that where separating from the cruise ship tours for whatever reason. <In review of the T-100 data after talking with Jim it shows Frontier Flying had flights in the past 5 years using the Beech 1900>. Are they considering providing scheduled service into Seward? Not within the foreseeable future (which he clarified was probably 5 years). What would it take for them to consider services? Demand and a better approach; he looked it up and said with 4300' ceilings it would be to unreliable to commit to scheduled service. If they did add a scheduled service what aircraft would they use? Not one of their Part 121 aircraft, probably a smaller VFR aircraft like a 206 or a Caravan. I explained the runway situation in Seward and the importance of determining the future design aircraft for purpose of determining runway length and design group. He said he thought the State should maintain at a minimum at least a 4000' runway; if nothing else for medevac operations (he suggested we make contact with the medevac providers if we hadn't already done so).
8/8/2014 2:32 PM by Patrick Cotter	Mike Fisher Northern Economics 907.274.5600	P	Mike called me back to talk about NEI's feasibility study for relocating the CDQ fleet to Seward. Coastal Villages was very interested in keeping their fleet in Alaska during the off-season – ½ of the fleet in Seward and ½ in Platinum. In the last couple years, Coastal Villages' growth has slowed down and now they aren't as interested in investing in infrastructure in those ports. NEI's feasibility study also determined that expanding the SMIC to accommodate the CDQ fleet didn't "pencil out" for the city. Essentially the city would have to either find other users during the times the CDQ fleet was out to sea, or charge the CDQ a ridiculously high rate. The feasibility study didn't include an assessment of who those other users might be.
8/7/2014 12:33 PM by Patrick Cotter	Tim Veneer Guardian 907.982.2299	P	I called Tim to discuss Guardian's use of the Seward Airport. He said that they use a King Air to service SWD, approximately 20-50 times/year. They do not have a helicopter. He mentioned that there are times when the braking action is nil at SWD and they can't land. I asked about Lear Jet use and he said it would need a wider and longer runway, as well as a better approach.
8/1/2014 11:43 AM by Patrick Cotter	Tim Nixon LifeMed 907.249.8402	P	Tim returned my call to discuss LifeMed's use of Seward Airport, including aircraft types and needs. He said that they have approximately 100 medevac flights out of Seward every year. Roughly 70 are by helicopter and 30 by fixed-wing. The fixed-wing is a King Air dispatched out of Fairbanks. They also have a Lear Jet, but it requires 5,000' of runway. He mentioned that Seward is fogged in pretty regularly and often prevents the helicopter from getting in. He gave me the chief pilot's number and told me that he could answer specific questions about the aircraft and runway needs. Steve Lewis – 907.317.7614
7/31/2014 9:21 AM by Patrick Cotter	Kristen Providence Seward Medical & Care Ctr 224.5205	P	Called Seward Providence to ask how they use the airport for Medevacs. Kristen told me they call one of their flight services (either LifeMed or Guardian) and let them decide what type of aircraft to use. Generally, LifeMed will choose the helicopter first, while Guardian tends to use fixed-wing. Helicopters can land at the medical center, but will occasionally use the airport if conditions warrant. Local ambulance will transport the patient to the airport.

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7/24/2014 11:48 AM by Ken Risse	Mike Insalaco Seward Aircraft Storage 830-7393	CE	Mike is working with Lucky Wilson, who has a lease lot and the large hangar for sale at Seward. Lucky is out of state right now. I called Mike on 7-14-14. They do not have any aircraft at Seward, but have a large hangar available. He felt if the runway length were reduced, it would affect the viability of their business. The hangar was built for large aircraft like the Coast Guard Apache Helicopters, Beech 1900 or other large aircraft that ERA or other commuter air carriers may use. He felt the runway length should be 5000' for landing larger commuter aircraft. He has seen a Beech Premier jet aircraft parking at Seward 1-2 times /year. Airport needs he listed include: A better instrument approach – lengthening the short runway would give a better alignment for up the valley. When ERA flew, the GPS approach was on the wrong runway. Although there was just as much traffic at Seward as Kenai, Mark Air Express could not open a station at Seward because of the weather and poor approaches. Seward also needs a place for seaplanes to be hauled out. Tiedowns on the apron need to be fixed.
7/9/14 8:30 am	Jerry Olson (907)362-2510		Give him a call in the afternoon. He might be around. Not a lot of time to talk/busy season.
7/9/14 8:40 am	Scenic Mountain Air (907)288-3646		Not interested in meeting. He's done these things before and believes it's a waste of time. Doesn't care what they do with the runway. His big issue is the cell phone towers nearby. They are a danger and someone is going to kill themselves on them one day.
7/9/14 8:45 am	Denny Hamilton (Seward Air) (909)491-1357		He's 5 minutes away. Give him a call when we're available and he'll come by the airport.
7/9/14 8:50 am	Dennis Perry (907)362-1866		Has a dentist appointment in the morning. Will stop by afterward, probably around 11:30. Told him we would leave him a message on his cell when we are in town. His is the 3rd hangar from the end.
7/9/14 9:00 am 7/9/14 3:15 pm	Brandon Anderson (Civil Air Patrol) (907)224-3000		Left message – our contact info, when we will be at the airport, why we would like to meet He should be on-site after 11:30 and there for several hours. Stop by at your convenience.
7/9/14 9:00 am	Gregory Thrall (907)288-3643		Left message – our contact info, when we will be at the airport, why we would like to meet [tried again at 3:15pm, voicemail]
7/9/14 9:00 am	Lucky Wilson (907)224-5664		Left message – our contact info, when we will be at the airport, why we would like to meet [tried again at 3:15, voicemail]

From Allan Ball Date Tuesday, December 11, 2012 2:31:22 PM
To Beaton, Barbara J (DOT)
Cc Rule, Michael J (DOT)
Subject NetJets aircraft information document

Fleet Resource 10.26.12.pdf (19 KB HTML)

Hello Barb,

Thank you for your time today. As I explained, this request is for one of our aircraft Owners that is connecting with a cruise departing/arriving Seward and will likely be a one shot trip. I believe that his aircraft selection will be based upon the usable runway length and the size aircraft that can safely conduct operations at Seward. The different sizes and weights are included on the document that I have attached. **If the runway is +4500** feet in length, **the potential aircraft could be one of our Falcons (DA2000 or DA2EASy) – and** the weight would probably be limited by the performance of the aircraft on a short runway. I can get you representative weights at your request. Or if the **runway is +4200 in** length, the aircraft with legs that could reach Seward from the lower 48 is probably the **CE680 (Citation Sovereign).** We will await your review before presenting any information to the Owner. It is our request that we could provide them adequate information sometime in December if at all possible.

A pleasure talking with you, I look forward to continuing the discussion.

Best regards,

Al Ball
Manager
Operational Intelligence & Analysis
NetJets® Inc.

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Columbus, OH 43219
T: 614 239 4873
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NetJets® Inc. is a Berkshire Hathaway® Company

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NetJets
Fleet Aircraft Resource

AIRCRAFT TYPE	FUEL DELIVERY	PRIST	RUNWAY SPECS: DRY ABSOLUTE MINIMUM	RUNWAY SPECS: MINIMUM RUNWAY WIDTH	RUNWAY SPECS: MINIMUM TAXIWAY WIDTH	AIRCRAFT SPECS: DESIGN CATEGORY	AIRCRAFT SPECS: MAIN GEAR SPACING	AIRCRAFT SPECS: AIRCRAFT WING SPAN	AIRCRAFT SPECS: AIRCRAFT TAIL HEIGHT	AIRCRAFT SPECS: ACN	AIRCRAFT SPECS: MAIN TIRE PRESSURE	OPERATING WEIGHTS: NJ BASIC OPERATING WEIGHT	OPERATING WEIGHTS: MAX ZERO FUEL WEIGHT	OPERATING WEIGHTS: MINIMUM RELEASE FUEL (LBS)	OPERATING WEIGHTS: MAX LANDING WEIGHT	OPERATING WEIGHTS: MAX TAKEOFF WEIGHT	SPEEDS: APPROACH CAT/SPD STRAIGHT-IN (VRef)	SPEEDS: APPROACH CAT CIRCLING or Vref + 20
EMB-505	S/O	NO	3500'	50'	30'	BII	9'4"	52'3"	16'9"	5/7.5	174	11922	13999	1750	16865	17968	B	C
CE-560 E	S/O	NO	3500'	50'	35'	BII	13'4"	54' 9"	15' 5"	7	156	10865	12600	1643	15200	16630	B 108	C
CE-560 P	S/O	NO	3500'	50'	35'	BII	13'4"	54' 9"	15' 4"	7	158	10954	12600	1539	15200	16830	B 108	C
CE-560 XL	S/O	NO	3800'	50'	30'	BII	14' 11"	55' 9"	17' 3"	9/10	210	13117	15000	1972	18700	20000	B 117	C
CE-560 XLS	S/O	NO	3800'	50'	30'	BII	14' 11"	55' 9"	17' 3"	9/10	210	13117	15200	1935	18700	20200	B 117	C
CE-680	S/O	NO	4000'	70'	35'	BII	10' 1"	63' 2"	20'	10/11	160	18440	20300	2564	27100	30300	B 110	C
CE-750	S/O	NO	4600'	75'	35'	CII	10' 7"	63' 8"	19' 2"	8/13	180	22139	24400	2968	31800	35700	C 131	D
BE-400	O/W	NO	4200	50'	35'	BII	9' 4"	43' 6"	13' 11"	7	125	11253	13000	1855	15700	16300	B 117	C
HS-125/800 XPC	S/O	NO	4500'	75'	35'	CII	9' 2"	51' 5"	17' 5"	4/9	135	17305	18450	2407	23350	28000	C 127	D
HS-125/900 XP	S/O	NO	4500'	75'	35'	CII	9' 2"	54'4"	17' 5"	4/9	135	16647	18450	2407	23350	28000	C 127	D
G-200	S/O	NO	4600'	75'	35'	CII	12' 6"	58' 1"	21' 5"	4/11	203	20296	24000	2977	28000	35450	C 140	D
DA-2000 (33K)	S/O	NO	4500'	75'	35'	CII	14' 6"	63' 5"	22' 9"	5/12	190	23186	28660	3033	33000	36500	C 126/128	D
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DA-2EASY	S/O	NO	4500'	75'	35'	CII	14' 7"	63' 5"	23' 2"	5/15	229	24269	29700	3362	39300	42200	C 138	D
GIV-SP/450	S/O	NO	4500'	75'	45'	CII	16'	77' 10"	24' 5"	10/26	189	43656	49000	3-5000	66000	74600	C/D 126-144	C/D 140-150
GV/550	S/O	NO	4500'	75'	45'	CIII	17'	93' 6"	25' 10"	17/33	198	48348	54500	3-5000	75300	90500	C 112-124	C/D 122-134
GL5T	S/O	NO	5000'	100'	50'	CIII	13' 4"	94'	25' 6"	15/31	182	51731	58000	4000	78600	92500	C	C
GLEX	S/O	NO	5000'	100'	50'	CIII	13' 4"	94'	25' 6"	14/33	185	53373	58000	4000	78600	99500	C	C

S - Single Point, O/W - Overwing, S/O - Both
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NetJets pax wts - 221 Smr, 226 Wntr
* *This document not valid for flight planning* *

10/26/2012

Contact:
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10/26/2012

APPENDIX B

Alternatives

Table of Contents

Seward Airport *Alternative Evaluation*

Alternative Descriptions	***Alternative 1.1***		***Alternative 2.2***		***Alternative 3***	
Main Runway Disposition	Raise the main runway (maintain existing length and embankment width) - protect from overtopping and protect from erosion		Allow main runway to be overtopped by floodwaters		Allow main runway to be overtopped by floodwaters	
Crosswind Runway (CW) Disposition	Raise crosswind runway on north to match raised main runway.		Offset CW runway from apron to allow Design Group II aircraft; shift threshold north to avoid VE impacts; widen to 75' (150' safety area) and lengthen to 3300' (3900' safety area)		Offset CW runway from apron to allow Design Group II aircraft; shift alignment to avoid ARRC on south end, shift north to reduce impact in VE zone; widen to 75' (150' safety area) and lengthen to 4000' (4600' safety area)	
Hydraulic Analysis	Use Q100 with 2-foot freeboard on main runway. This option is within the floodway; consider impacts to properties due to change in the floodway.		Use Q100 with 2-foot freeboard on CW; raise CW elevation; provide erosion protection		Use Q100 with 2-foot freeboard on crosswind; raise CW elevation; provide erosion protection; provide protection for the portion in the VE zone	
Evaluation Criteria	*Advantage*	*Disadvantage*	*Advantage*	*Disadvantage*	*Advantage*	*Disadvantage*
Cost						
Construction/Earthwork Cost - for comparison only -Not total project costs		$13 million		$11 million		$16 million
Maintenance & Operations (M&O)	Acts as a levee to protect the apron from 100-year flood	More snow removal and pavement surface to maintain than others - assumes the erosion protection is stable/permanent and no additional costs for M&O within the design life. More lighting and pavement markings to maintain.	M&O costs will be less; pavement and lighting for only one runway;new runway embankment acts as a levee to protect the apron from flooding	Maintain closed runway markings; assumes the stabilization is permanent and no additional costs for M&O within the design life	M&O costs less than existing. Only one runway with pavement and lighting to maintain . Embankment acts as a levee to protect the apron from flooding	Similar to Alt 2.2; although slightly more because the longer runway requires additional maintenance due to extra pavement, markings, lights, etc.
Right of Way --preliminary costs only		$1,300,000		$950,000		$950,000
FAA Funding Eligibility	Generally easier to get approval of work on existing facility	Two runways may be seen as unwarranted; Environmental Impacts could trigger scrutiny of funding	Should be eligible	None	Should be eligible for FAA funding up to 3300' length.	4000' length would require other funding sources to supplement the FAA funding.
Ability to Serve the Community's Needs						
Medevac	Longest runway - best for jets; also see wind coverage. Allows C-130 access in case of a mass casualty event (very infrequent need).		Serves the King Air 200, provides for basic medevac service	Too short for jets	Longer than Alt 2.2, 4000' length preferable for King Air pilots	Too short for long-range jets with destinations outside of Alaska
Meets General Aviation	Improves Runway. Exceeds the forecasted aviation needs.		Improves Runway most often used and adds length. Wider/longer runway accomodates operational tolerance during occasional strong winds.		Improves Runway most often used and adds length. Wider/longer runway accomodates operational tolerance during occasional strong winds.	
Search and Rescue	Improves Runway		Better Apron Access	Eliminates Longer Runway	Better Apron Access	Shorter than Alternative 1.1
Economic Development	Longest runway - supports occasional use by Lear jets, tourism opportunities, larger cargo and passenger planes; improves reliability (runway open under a greater range of conditions) and potential for aviation-related business development at the airport including Lear jets and commuter operations	No change to apron area, which limits use of large aircraft on the apron, thus limits business development.	Runway offset provides for larger aircraft (DG II) on the apron taxilane; provides more areas for use by larger aircraft and thus could provide FBO's with greater operational area	Runway too short for Beech 1900 commuter service	Runway offset provides for larger aircraft (DG II) on the apron taxilane; longer runway facilitates use by FBO's including commuter aircraft and some short range jets	
Safety, Engineering & User Considerations (Items not covered by Costs)						
Wind	Two runways provide slightly better wind coverage for small aircraft. Combined coverage DG II =99.93, DG I = 99.64	Longer runway (13/31) orientation is not as good as the "crosswind" runway. RW 13/31 coverage DG I = 91.1%, DG II = 96.0%	Provides longer/wider runway for best wind coverage orientation; DG I = 98.6% ; DG II = 99.53%. A number of pilots seem to favor improving the cross-wind versus the main runway.	Slightly reduced coverage due to single runway but meets FAA guidelines for a single runway.	Provides longest runway for best wind coverage orientation; DG I = 98.6% ; DG II = 99.53%. A number of pilots seem to favor improving the cross-wind versus the main runway.	Slightly reduced coverage due to single runway but meets FAA guidelines for a single runway.
Airspace/Runway Protection Zone (RPZ)/Approach Obstructions	**Airspace**: Higher runway, slightly less penetration of airspace	**RPZ**: Main runway has undesirable uses in the RPZ, (Public Road, Railroad) **Approach:** Existing obstructions in the RW 13 approach (road, railroad) would remain. ARRC is planning barge loading/unloading facilities under the approach of RW 34	**Approach:** Horizontal shift of runway moves the RW 34 approach away from the proposed ARRC development; Closing the main runway significantly reduces RW 13 RPZ obstructions.	RPZ: ARRC development for barge operations (jetty, access road) may occur in RPZ.	**Approach**: Horizontal shift of runway moves the RW 34 approach away from the proposed Alaska Railroad development. Significantly reduces RW 13 RPZ obstructions.	RPZ: ARRC development for barge operations (jetty, access road) may occur in RPZ. RPZ and approach extend into the planned ARRC barge basin.

Alternative Descriptions	Alternative 1.1	Alternative 2.2	Alternative 3
Main Runway Disposition	Raise the main runway (maintain existing length and embankment width) - protect from overtopping and protect from erosion	Allow main runway to be overtopped by floodwaters	Allow main runway to be overtopped by floodwaters
Crosswind Runway (CW) Disposition	Raise crosswind runway on north to match raised main runway.	Offset CW runway from apron to allow Design Group II aircraft; shift threshold north to avoid VE impacts; widen to 75' (150' safety area) and lengthen to 3300' (3900' safety area)	Offset CW runway from apron to allow Design Group II aircraft; shift alignment to avoid ARRC on south end, shift north to reduce impact in VE zone; widen to 75' (150' safety area) and lengthen to 4000' (4600' safety area)
Hydraulic Analysis	Use Q100 with 2-foot freeboard on main runway. This option is within the floodway; consider impacts to properties due to change in the floodway.	Use Q100 with 2-foot freeboard on CW; raise CW elevation; provide erosion protection	Use Q100 with 2-foot freeboard on crosswind; raise CW elevation; provide erosion protection; provide protection for the portion in the VE zone

Evaluation Criteria	Alt 1.1 Advantage	Alt 1.1 Disadvantage	Alt 2.2 Advantage	Alt 2.2 Disadvantage	Alt 3 Advantage	Alt 3 Disadvantage
User Function/Runway Reliability/ Level of Service (LOS)	Uses existing VASI approach aids; Higher (above the flood) runway will improve the reliability of the airport; LOS is slightly higher because capacity is increased	Long taxi path; requires displaced threshold to meet RSA requirement.	Lengthens the runway along the orientation for prevailing winds; meets the needs of the based aircraft; improves apron expansion opportunities; reduces congestion; provides full safety area; Higher (above the flood) runway will improve the reliability of the airport. Shorter taxi path.	Large infrequent aircraft, such as Coast Guard C-130 will be unable to use as well as some larger commuter aircraft.	Lengthens the runway along the orientation for prevailing winds; improves apron expansion opportunities; reduces congestion; provides full safety area. Higher (above the flood) runway will improve the reliability of the airport. Shorter taxi path.	Still limits use by infrequent large aircraft, but functions well for based aircraft, medevac, and future commuter aircraft; Single runway provides lower LOS than two runways
Long-Term Stability/Risks	On existing embankments, which are stable except for erosion.	Greater risk of flood damage since the river is next to the runway and the "model" has variables; climate change could affect river flow; additional sediment deposition unpredictable. Requires reconstruction of runway to meet bearing capacity requirement	R/W provides flood protecton for apron. Runway is sited further from the river, less potential for flood impacts.	Potential risk to downstream (ARRC) facilities if the river moves	Provides flood protecton for apron. Runway is sited further from the river, less potential for flood impacts.	Potential risk to downstream (ARRC) facilities if river moves; is within VE zone and susceptible to tidal influence (greater potential effects from sea level rise).
Construction Considerations		Riprap installation below water, in river channel, more difficult. Construction likely delayed (as much as 2 years) by a CLOMAR/ LOMAR process with public hearings.	No riprap placement into river channel. Results in easier installation.	Construction phasing will be most challenging. If excavation from abandoned runway is used for fill, both runways will be under construction concurrently.	Same as Alt 2.2.	Runway extends out into tidally influenced region. Requires extension of Riprap into the tidal zone. CLOMAR/ LOMAR may be required and could delay construction, but expected to be easier and quicker to obtain than Alt. 1.1. Longer runway is more flexible for construction phasing.
Environmental Considerations						
Floodplain/Floodway Impacts	Provides flood protection for apron since runway acts a levee. Raises Main RW 2 feet above 100-year flood level.	In the floodway - increases the flood elevation by up to 4', impacts additional private properties. Permitting will face more obstacles due to public process and floodway impacts = expensive and time delays. Impacts the floodway - requires revision to the FIRM map. Process includes public involvement.	Provides flood protection for apron since runway acts a levee. Does not impact the floodway - no change to the FIRM map needed. Eventual breach of main runway would partially remove an obstruction in the floodplain/ floodway.	Greater chance for channel movement into the floodplain when flood waters breach the main runway. In floodplain - increases the flood elevation by <1 foot (with coastal flooding considered); (however based on previous discussions by DOT with FEMA and City 1' rise is okay)	Provides flood protection for apron since runway acts a levee. Eventual breach of main runway would partially remove an obstruction in the floodplain/ floodway. Construction penetrates the VE zone, but is still more likely permittable than Alt 1.1.	Greater chance for channel movement into the floodplain when flood waters breach the main runway. In floodplain - increases the flood elevation by <1 foot (with coastal flooding considered); (however based on previous discussions by DOT with FEMA and City 1' rise is okay). Does not impact floodway but a revision to the FIRM map needed to change the limits of the VE zone.
Fish Habitat Impacts	Least impact to intertidal (coastal) EFH area for salmon and marine fish species	Requires in water work to place erosion protection; most impacts to Resurrection River mainstream, which is EFH for salmon species	Fewer impacts to intertidal EFH than Alt 3. No impacts to Resurrection River than Alt 1.1.	More impacts to intertidal EFH than Alt 1.1.	In instream impacts to the Resurrection River	Greatest impacts to intertidal EFH; but is not within marine habit.
Wetlands Impacts	No wetlands fill associated with RW 16-34.	Most impacts to wetlands from fill in River to raise RW 13-31. May be difficult to permit because Clean Water Actequires selection of practicable alternative with least impacts.	Most permittable. Fewer acres of impacts than Alt 1.1.	Similar wetland impacts to Alt 3,but less due to shorter RW).	Fewer acres of impacts than Alt 1.1.	Similar wetland impacts to Alt 2.2 but more due to longer runway. Fill for longer RW would be harder to justify.
Endangered Species Act (ESA)/Bald Eagle	Farthest from Resurrection Bay where sea lions, otters and harbor seals are known to be located. Most acceptable under ESA and MMPA	Possible bald eagle nest impacts (based on 2004 nest sites), more so than with other alternatives	Similar distance from Resurrection Bay as Alt 3. Less fill near or in the bay than Alt 3.	Fill in/near Resurrection Bay and possible bald eagle nest impacts	Similar distance from Resurrection Bay as Alt 2.2.	Least acceptable under ESA and MMPA. More fill than Alt 2.2 in/near Resurrection Bay.
Human (Socioeconomic) Impacts (ROW Impacts, Compatiable Land Use)	Greater reliability of main RW and keeping both runways provides Increased capacity, higher LOS. This option would provide additional protection for the ARRC facilities	Flood plain impacts would impact more private properties adjacent to River and the affect their property values; portions of the impacted property are undeveloped and the properties lack access.	Flooding affects reduced therefore less property impacts during Q100. Longer RW 16-34, but not as long as in Alt 3.;	Loss of main RW and short length of RW 16-34 less favorable to the City from Economic development potential standpoint. Restricts access to floatplane takeout area.	Longer RW 16-34 than Alt 2.2; provides oppuntity for larger aircraft	Loss of main RW; Restricts access to floatplane takeout area.

Location	DOT&PF; Central Region Office, Bat Cave conference room	*Date/Time*	January 12, 2015, 9:30 – 12:30
Attendees	DOT: Barbara Beaton, Joy Vaughn, Morgan Merritt, Paul Janke PDC: Royce Conlon, Ken Risse (via telephone) HMM: Ken Karle (via telephone)	**Client #**	AKSAS 54857
		PDC #	14075FB
		Project Name	Seward Airport Improvements
		Prepared By	Royce Conlon in conjunction with notes provided from Barb and Joy
Subject	Draft Resurrection River bed rise report & alternatives for further evaluation		

Paul Janke provided written comments to the report which were discussed during the meeting. Key topics discussed are summarized below.

Review of Draft Resurrection River Bed Rise Report

Ken Karle provided an overview of the report: The data that was used included surveyed cross-sections (2007 & 2014) and LIDAR. Data for 1977 was also used but the location of the stream shifted between then and 2007. The analysis shows that the elevation of the thalweg downstream from the Seward Highway bridges lowered significantly from 2007 to 2014 at 13 of 15 cross-sections, with the maximum drop of 7.2 feet. However, an analysis of volumetric changes to the floodplain surfaces using the LiDAR data sets showed that there was a small rise of the floodplain surface between 2006 and 2014. Also, a cross-section analysis that focused on the main bank-to-bank unvegetated channel showed small average increases from 2007 to 2014. The overall cumulative change is so slight the comparison of the data shows less than 1" between 2007 and 2014; this would result in less than 1' over the course 20 years even though the common perception is that all braided streams are rising.

The report also indicates that the dredge pile that was left in the floodplain upstream of the airport appears to have been a significant source of the sediment moving toward the airport, and may have played a significant role in making the flooding worse there.

Paul mentioned that M&O has done some dredging near the south end of the long RW, which may have been responsible for the observed thalweg lowering from 2007 to 2014.. Ken K was not aware of it so that information was not part of his analysis. Ken will talk to M&O (Carl High (gone till Feb) and Mike Rule) to get information about how much material was taken out. The dredging could have potentially lowered the thalweg even upstream of the dredging location due to the "head cut."

Paul is not comfortable that the report does not explain possible causes of why the runway has overtopped multiply times in a year, if it is not bed rise. Paul acknowledged the stream could be in some kind of equilibrium, but is not comfortable with the contrast between this analysis which shows minimal bed rise and what he has observed at the southern end of the main RW embankment. He has seen more gravel bars appearing and there has been a marked increase in the frequency of overtopping events in recent years. He said that for many years, the runway was overtopped very infrequently and only at high tide. In 2012 it was overtopped 10 times, sometimes during more moderate discharges and at lower tides. (Royce noted that even though the average height of the floodplain has not risen much, looking at the graphs there does appear to be a significant amount of the floodplain that is higher.) Also, could the difference in the water surface elevations at the time of the different surveys affect the results?

There was discussion among the group, if the bed is not raising much, what is the mechanism that is causing the increase in overtopping events? (climate?) It was noted that stream gauging data is not available for the river and determining if additional flow is the cause of the over topping would be a substantial effort, and maybe non-conclusive.

Paul is commented that he was impressed with the large bed load he sees coming down the river from upstream of the bridges. (Dan Mahalak of KPB estimated it at 300,000 cy a year.) Isn't some of that that collecting in the delta? (ARRC is seeing a large amount of sediment coming out of the river – reportedly 60,000 cu yds in one storm.)

Paul also wants the report to be clearer qualitatively concerning the uncertainty introduced by, and the effect of various assumptions on the results… Ken K. said the difficulty lies in the fact that the data represent widely spaced "snapshots" in time. He said different hydrologists could arrive at widely different conclusions as to the amount of bed rise using the same data.

Barb stated that they need to understand how reliable these results are because the speed at which the bed is rising impacts whether raising the RW is a viable option. If in fact the bed is not rising very fast, it may be reasonable to raise the runway; otherwise, we would have to go back and raise the runway again too frequently.

The design discharge for determination of flood elevations to set the embankment heights was discussed. FAA guidance is written for stormwater, not rivers, and point to 10-year events, which seems too low. The State does not address the topic in the Aviation Preconstruction manual. Paul said Skip Barber's analysis used a 25-year storm, but Paul could not find a rationale for it. Paul says for highways next to rivers, the state uses a 50-year storm, but checks the 100-year level and often defaults that instead. Bush airports often use a 100-year storm, but that is for safely so that people have high ground to escape to in an emergency. Paul is going to research the topic and write a memo to issue a decision by the Department. Morgan suggested the flood frequency should consider "reasonable expenditure of FAA funds", or at least that is what FAA will be concerned about.

Morgan: Could we make dredging an option if the community agrees to participate in funding? (Paul is still concerned about liability.)

Alternatives for Evaluation: The discussion moved onto the next steps in evaluating solution including which alternatives should be evaluated.

Royce Conlon provided figures of current alternatives to facilitate discussion.

Ken Karle needs the cross-sectional area of the proposed design to analyze the effects of improvements the VE flood zone. He also needs some guidance on what “free-board” to consider. If bed rise if slight 1’ maybe adequate; given the uncertainty, maybe we should use something more? No conclusion was reached on this subject at the meeting.

Paul said that if we abandon the long RW, we should let the river take it and just protect the crosswind with erosion control. Is there a need to analyze the hydrology of the crosswind in those cases as if the long runway embankment is breached? We may need to raise the crosswind some. There was some discussion of slowing the erosion of the main RW embankment with measures that would be placed but not maintained (sheet pile? boulder filled trench?). If some sort of erosion inhibitor is used on the main runway, it should be placed so that they do not add to the volume of fill (thus does not affect the floodway. It was commented that if the design lets the main runway be breached this could have some impact on the ARRC facilities (namely the proposed jetty).The cross sections show the area between the runways is lower than the main channel. We may need to protect the runway embankment to control the channel.

No decision was made as to whether or not protection of the main runway should be considered in the alternative evaluations.

In discussing what runway length should be considered to meet the needs Morgan asked about medical evacuations and the community needs in case of emergency. The Seward Preparedness plan does mention the airport, but does not mention the services/functions of the airport, it difficult to tie the communities plan with any minimum runway length.

There was discussion about the hydraulic modeling needed to evaluate the erosion protection needed in the VE zone. Ken K. indicated the current FEMA Flood Insurance Study (FIS) includes a detailed wave height analysis of coastal flooding at specific locations, including the Resurrection River. Royce thought Shannon and Wilson has some experience with this, she will check.

Alternatives for analysis: 1.2, 2.1, 2.2, and develop Alt 3 (4000’ runway), depending on the best alignment from evaluation of 2.1 & 2.2, same with alternative 4 (4700’).

Alt 1.1 was placed on hold, (Barb send e-mail on 1/20/2014 giving the go-ahead to include it in our evaluation. Here direction further indicated “We should look at the impacts to properties on the other side of the river as a result of raising the base flood elevation. We may need to buy them out, depending on impacts.”

Alternative 2.3 was eliminated because it would impact land use of the ARRC (a portion of the RPZ) is over the area planned by ARRC for barging operations.

Each of the alternatives should show the adjacent land ownerships, so it is clear who may be impacted.

Open Issues:

- The design storm for determining the discharge which established the flood elevation will be recommended by Paul. Barb will then get FAA input on what to use.
- How much freeboard (the amount above the design flood elevation) is needed to evaluate the alternatives? The amount of freeboard is a function of the amount of bed rise and uncertainty in the flood frequency estimations. The amount of freeboard is still undetermined.
- Whether or not the Alternative should include protection of existing main runway was not decided; ie whether or not to allow the main runway to be breathed. .
- Whether or not the project scope should include further evaluation of factors that may have changed the design flows such as increased precipitation and/or temperature increase causing thaw of the upstream glaciers etc.

Action Items:

General

1) Talk to the city and borough about how they would respond to public outcry about alt 1.1. *<following the meeting, direction was provided to evaluate this alternative on 1/20/2015.>*

Paul:

1) Send Ken Karle Dan Mahalak's data / information about the sediment load.
2) Write memo about what design discharge and freeboard to use.

Ken K:

1) Provide map with section locations labeled to relate to runway and distance downstream from the bridge.
2) Provide updated cross-sections with horizontal locations labeled; increase scale to show the differential better.
3) Add historical photos showing the stockpile, if any and aerial photo prior to stockpile if available.
4) Talk to Mike Rule and/or Carl High to get details about the dredging that was done.

Royce:

1) Confirm Shannon and Wilson can provide coastal design to protect the runway in the ZE zone.
2) PDC to begin evaluations once design discharge is agreed upon.

Reference Documents:

1. Meeting Agenda, 1/12/2015
2. *Rate of Channel Bed Rise Analysis For the Resurrection River At The Seward Airport*, dated December 2014, by HMM.
3. Memorandum from Paul Janke, dated January 12, 2015 Subject: Comments on Rate of Channel Bed Rise report by HMM.
4. Graphics of the preliminary Alternatives

From: Royce Conlon
To: "Beaton, Barbara J (DOT)"
Cc: "Vaughn, Joy A (DOT)"; Ken Risse
Subject: RE: Seward Airport - Channel Bed Rise Report Notes
Date: Thursday, February 05, 2015 4:42:47 PM
Attachments: Alternatives for Consideration 15y02m01d.xlsx

Barb – good talking with you this afternoon – the follow summarizes our discussion:

You mentioned you received a copy of revised guidelines for flood plain management standards. Paul was going to incorporate some of the guidance from this revised standard into his draft memo from 1/23/2015 – also you will forward the revised standard to us for our edification. This guidance suggested a 2' freeboard which coincides with what we suggested below.

We discussed the 8 alternatives outlined in the spreadsheet sent on Monday (attached for reference); after discussion you are comfortable with PDC moving forward with evaluation of Alternatives 1.1, 2.2a and 3 and with these alternatives being developed based on Q100 discharge flows and 2' of freeboard.

I indicated we had established profiles for those three alternatives and refined the alignments (slightly); we will now apply the "template" (which is now called an "assembly" in Civil 3D) to produce the 3D model of the runway embankment from which we will cut the cross sections to give to Ken Karle to superimpose in his HEC-RAS model. You asked what the typical section looked like in terms of embankment layers. At this point we give Ken K. only the embankment outline; he will then run the model to determine the velocities that are needed to determine the "rock requirements" needed to protect the embankment – concurrently we will work with S&W to provide us conceptual recommendations of the embankment section.

We discussed the budget constraints, by looking at only the 3 alternatives suggested and by reducing the effort for the evaluation work session; we should be able to stay within the budget for the "scoping" phase.

You mentioned M&O has indicated they feel the dike built in 2013 maybe failing and as such although the project is not programmed until 2018 it could be moved up if the dike fails and causes an emergency.
I will work with Ken K and Kyle with S&W and get you a schedule for when we can have the hydro report and alternatives analysis complete.

Please let me know if I have missed any key item from our discussion.

From: Royce Conlon
Sent: Monday, February 02, 2015 6:21 PM
To: 'Beaton, Barbara J (DOT)'
Cc: Vaughn, Joy A (DOT); Ken Risse
Subject: RE: Seward Airport - Channel Bed Rise Report Notes

Barb & Joy - thanks for the notes, I served on Grand Jury duty the last 2 weeks which took 5 full days out of my schedule, so thank you for your patience.

Attached are a compilation of notes of the 1/12/2015 meeting. This compiles the notes from you, Ken K, Ken R and myself.

I will call you once you have had time to review and digest the e-mail and attachments.

Also attached you will find a summary of the alternatives that I believe have been discussed for evaluation; the table shows 5 main alternatives with twists to 3 of the alternatives for a total of 8. Our original budget was established based on an assumption of up to 3 alternatives. That being said, we can evaluate as many alternatives that are needed, but presently I'm concerned we don't have enough budget to complete the evaluation of even 3 alternatives without some other adjustments. At the bottom of this e-mail you can review my budget evaluation.

Our suggestion would be that we start by evaluating three key alternatives (those highlighted in yellow on the attached spreadsheet) and depending upon the outcome of that evaluation, we can discuss the need to evaluate additional alternatives. We selected these three alternatives because they span the range of the 8 alternatives.

- Alt 1.1 would raise the existing runway elevation, it would potentially have the greatest impact on the floodway but we will then be about to document the elimination of this alternative should the impacts turn out to be to severe;
- Alternative 2.2 with the main runway abandoned as a runway but enhanced to protect it from being breached. (such as sheetpile or a large rock core being added to the without adding fill) – This alternative would avoid both the floodway and the ZE zone.
- Option 3 extents out into the VE zone and provide an incrementally longer runway than the minimum 3300', this alterative considered that the existing main runway will be breached, thus causing the need for additional armoring of the crosswind runway. With this alternative we will have to make assumptions relative to the area that might 1st be breached and the geometry of that breach in terms of width etc.

We developed this approach in concert with Ken Karle who is also concerned with having to many options for evaluation given his budget.

Also for the purpose of the evaluations above, we propose to use the Q100 with 2 foot of freeboard; I will reply to the e-mail last week about the Q2 and Q5 separately.

Budget Evaluation

Remaining budget for Task 2 (as of 2/1/2015) = $51,500.

Remaining tasks to be completed and associated budgets based on the original task/manhour breakdown:

- Initial evaluation - $17,548
- Technical Memo/Data gap summary - $9705
- Evaluation worksession - $11,118
- Scoping report Draft - $10,712
- Scoping Report Reviews and Mtg with DOT - $7,369
- Final Scoping Report - $3,575

Total estimated to be needed ....$60,027 (thus $8500 short of the budget)

In addition we need a bit of time to incorporate the last changes into the Forecast and Facility requirements document, which will be a piece of the Draft Scoping Report.

On task that I think we can reduce, in order to stay within budget, would be to par down the evaluation worksession effort, we can trim that to include only essential staff and reduce the meeting preparation time.

FIRM: PDC | PROJECT TITLE: Seward Airport

TASK NO: Task 1 cont. | TASK DESCRIPTION: Project Scoping | DATE: 5/7/2014

GROUP: | METHOD OF PAYMENT: FP ☐ FPPE☐ T&E☐ CPFF☑ | PREPARED BY: RLC

SUB-TASK NO.	SUB-TASK DESCRIPTION	LABOR HOURS PER JOB CLASSIFICATION										
		PIC	Project Manager	Senior Engineer	Staff Engineer	Enviro Analyst	Sr.Planner / GIS	Jr.Planner /GIS Tech	CADD	Tech Editor/cler	Clerical	PLS 5
		Conlon	Conlon	Risse	Estabrook	Betts	Cotter	Hill	Varies	Dorsett	Varies	Ranson
	Develop Intial Alternatives (Layout)		2	6	30			4	8			
	Initial eval		1	6	16							
	Initial Cost of Development		1	4	20							
	Initial Environ Review		1	2	2	16						
	Land requirements		1	2								8
	Location Memo/Data Gap Summary		4	6	20	6	6	8	4	6	4	
	Evaluation worksession (Team, DOT, others TBD)											
	Prep		8	4	8	2	4	4	2		2	
	travel/attend/particpate		8	8	4	8	4				8	
B5.4	**Field Recon (travel/participate)**		16	16							12	
	Meetings with Locals		4	4		4						
	Alternative Refinement											
	Coord H&H, adjust layouts, refine costs, enviro		4	6	24	8				6	4	
B5.5	**Scoping Report**											
	Draft Report for DOT/FAA review		4	4	16	8	4	6	2	8	8	
	Data Gap/Aquistion Plan		2	6	4	4					8	
	In-House QC	4	4	4	2	2	2			4	2	
	Review meeting		4	4	2	2	2				2	
	Final Scoping Report		2	2	6	2		4			1	
TOTAL LABOR HOURS		4	66	84	154	62	22	26	16	24	51	8
*** LABOR RATES ($/HR)**		$71.15	$60.00	$52.51	$34.90	$31.00	$38.80	$24.50	$29.43	$30.00	$17.26	$43.40
LABOR COSTS ($)		$284.60	$3,960.00	$4,410.84	$5,374.60	$1,922.00	$853.60	$637.00	$470.88	$720.00	$880.26	$347.20

From: Beaton, Barbara J (DOT) [mailto:barbara.beaton@alaska.gov]
Sent: Monday, January 26, 2015 2:17 PM
To: Royce Conlon
Cc: Vaughn, Joy A (DOT)
Subject: Seward Airport - Channel Bed Rise Report Notes

Hope you had a great weekend. Attached are my notes and Joy's from our teleconference.

Thanks,

Barbara J. Beaton, P.E.
Project Manager
Aviation Design
Alaska Department of Transportation & PF
4111 Aviation Drive
Anchorage, AK 99502
(907) 269-0617

Final Hydrologic and Hydraulic Report

Seward Airport Improvements Project

Prepared for:

PDC, Inc. Engineers
1028 Aurora Drive
Fairbanks, AK 99709

And the
Alaska Department of Transportation
and Public Facilities
Central Region
Anchorage, AK 99509

Prepared by:

Hydraulic Mapping and Modeling
1091 West Chena Hills Drive
Fairbanks, AK 99709

July 2016

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July 2016

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Executive Summary

The Alaska Department of Transportation and Public Facilities wishes to make improvements at the Seward Airport, located on the Kenai Peninsula at the north end of Resurrection Bay. Most of the Seward Airport is located within the floodplain of the Resurrection River, on an alluvial fan at the river's mouth. The airport has flooded many times over the years, and the frequency and severity of flooding has been steadily increasing.

Though much of the Resurrection River floodplain downstream of the Seward Highway has remained unchanged, significant elevation changes have occurred at some locations. From 2009 to 2014, LiDAR data indicates that sediment deposition of between 1 to 2 feet has occurred on both banks. Several smaller areas, notably on the right bank, also show deposition of 3 to 4.5 feet. The rise in elevation is thought by some to be responsible for more frequent flooding of Runway 13/31. In addition, some areas show a decrease in elevation, as large as 3 feet.

This project has two primary purposes. The first is to develop engineering alternatives that will protect airport facilities from further damage caused by recurrent flooding, and the second is to correct airport deficiencies that may exist based on the airport's forecast function and FAA design standards. Based on existing conditions, data collection, public involvement, and input from airport stakeholders, three alternative design concepts were developed for the Seward Airport:

1) Alternative 1.1-Reconstruct Runway 13/31, upgrade erosion protection, retain Runway 16/34;
2) Alternative 2.2-Reconstruct Runway 16/34, abandon Runway 13/31 and install armor to prevent embankment erosion and channel migration;
3) Alternative 3.0-Reconstruct Runway 16/34, upgrade erosion protection, abandon Runway 13/31 and allow flooding to overtop and erode over time.

Four HEC-RAS hydraulic models were developed to analyze the water surface profile of flood events and determine the potential water surface elevation, scour depth and the range of hydraulic forces acting on the design alternatives. An Existing Ground (EG) model was developed by updating a 2010 FEMA HEC-RAS model with LiDAR topographic data and channel cross-section surveys acquired in 2014. The EG model was then modified with Civil3D surfaces to represent the runway geometries of the three design alternatives. The design flood for the hydraulic analyses was the 100-year (base) flood. Additionally, the analyses considered coastal flooding from Resurrection Bay.

Results from the hydraulic analyses included comparison graphs of the 100-yr surface profiles, floodplain maps, and estimates of channel velocities, water surface elevations, and increases in the base flood elevation from existing conditions. A summary of the results follows:

- Alt 1.1 - Water surface elevations across the floodplain east of the runway are substantially higher than those of the EG model; the maximum water surface elevation increase is 4.04 feet. Private parcels in the middle of the Resurrection River floodplain will be completely inundated during the 100-year flood. Some expansion of the eastern boundary of the floodplain will occur.

- Alt 2.2 - The maximum water surface elevation increase is 0.78 feet. Private parcels in the middle of the Resurrection River floodplain will be partially inundated, and a slight expansion of the eastern boundary of the 100-year floodplain will occur.

- Alt 3.0 - The maximum water surface elevation increase is 0.79 feet. Private parcels in the middle of the Resurrection River floodplain will be partially inundated, and a slight expansion of the eastern boundary of the 100-year floodplain will occur.

FEMA regulations prohibit encroachments, fill, new development, and other development within the adopted regulatory floodway unless the proposed encroachment would not result in any increase in the 100-year discharge. Of the three proposed design alternatives, only Alternative 1.1 involves development within an existing regulatory floodway. If selected as the engineering preferred alternative, this design would likely face substantial permitting obstacles and requires modification to the effective FIRM and Floodway Map.

Alternatives 2.2 and 3.0 do not require encroachment within the Regulatory Floodway, and will result in BFE increases of less than 1 foot. Impacts to private properties from the BFE increases are much smaller than with Alternative 1.1. However, either of these alternatives may still require a Conditional Letter of Map Revision (CLOMR).

Based on the hydraulic analysis, as well as applicable local and FEMA floodway and floodplain regulations, the engineering preferred design should be either Alternative 2.2 or 3.0. The recommended design water surface elevation for the Seward Airport Improvements project is the water surface elevation during the discharge with a 100-year return interval plus a two-foot freeboard.

Project Location and Description

The Alaska Department of Transportation and Public Facilities (ADOT&PF) wishes to make improvements at the Seward Airport (Figures 1 and 2). The Seward Airport is located on the Kenai Peninsula at the north end of Resurrection Bay, about 75 air miles, or 125 highway miles southwest of Anchorage. The State owns and operates the airport which includes a paved main runway (13/31), a paved crosswind runway (16/34), multiple taxiways and two aprons. Planned improvements may include runway/taxiway reconstruction, pavement rehabilitation, as well as installation of new airport lighting/electrical enclosure building, navigation aids, additional fencing and erosion control/armor protection.

Most of the Seward Airport is located within the floodplain of the Resurrection River, on an alluvial fan at the river's mouth. The airport has flooded many times over the years. The frequency and severity of flooding has been steadily increasing, as the delta is aggrading and thereby reducing the elevation difference between the riverbed and airport surfaces.

A major focus of this project will be to develop engineering alternatives that will protect the airport facilities from flooding damage. This report includes an analysis of the hydrologic characteristics of the Resurrection River, and a hydraulic analysis of the alternative designs for runway embankments and erosion protection.

Flooding History

As noted, there is a long history of flooding and erosion problems at the Seward Airport. Descriptions of flood events go back at least as far as 1951, when Runway 13/31 was constructed. Dozers uncovered subsurface springs, which flooded the new surface and led to the installation of subsurface drains. Heavy rainfall and seasonal high tides led to additional construction delays. Periodic flooding has occurred since then; however, the floods of 1986 and 1995 remain noteworthy for their magnitude and resultant damage to the runway embankments.

The 1995 flood shifted 90 percent of the Resurrection River's flow into a channel adjacent to Runway 13/31 (ADOT&PF, 2008). The aerial imagery in Figure 2, taken in 2014, includes an overlay of the channel's position in 1950. During the 13 years from 1995 to 2008, the runway was overtopped about 4 times. During the 4 years from 2009 to September 2013, the runway was overtopped 15 times. These instances were initially limited to the fall but are now occurring in the summer as well (June to November). The increased frequency indicates that lower flowrates, rather than only major floods, are now capable of flooding the runway.

Descriptions of the hydrology of the Resurrection River and the climate of Seward, Alaska are included in Barber (2006) and FEMA (2013). The Barber report (2006) provides an extensive description of the hydrology, climate, geomorphology, and a detailed description of the sequence and effects of some of the major flooding events, including the 1986 and 1995 floods.

A brief summary of flood events is found in Appendix A. Aerial images of the Seward Airport from 1950 to 2014, including the 1950 channel overlay, are found in Appendix B.

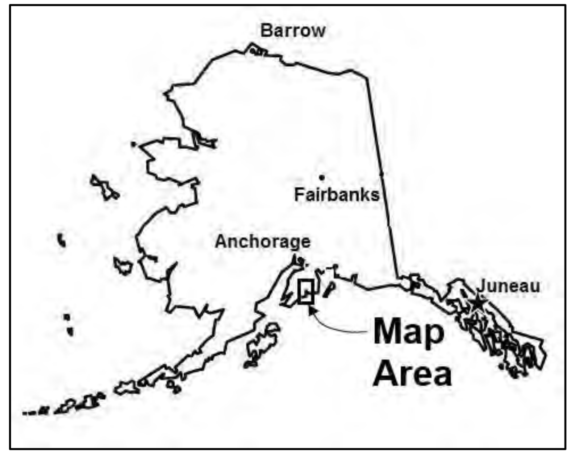

Figure 1. Project location map.

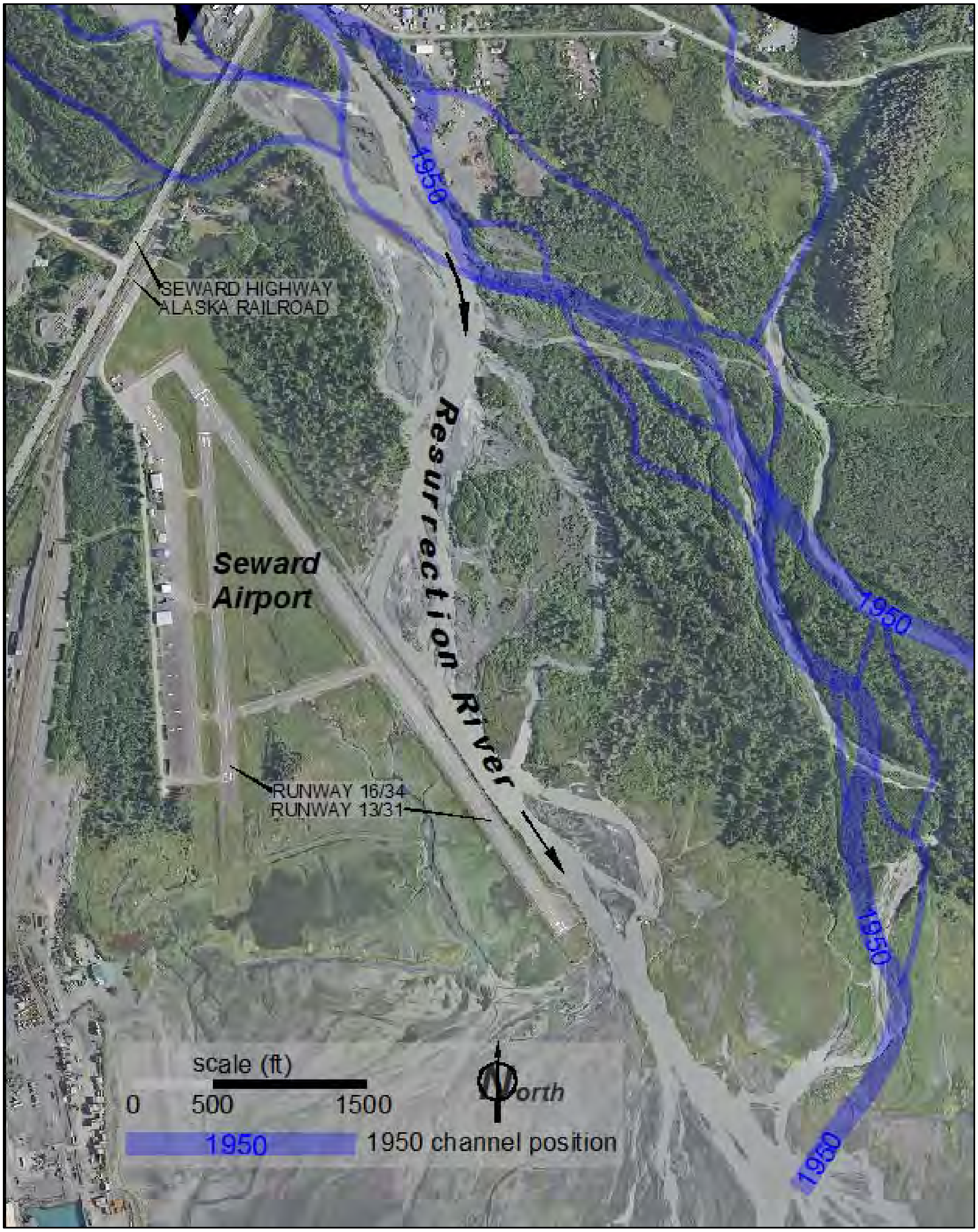

Figure 2. Project aerial imagery, August 2014. Historic channel position overlay from 1950 USGS imagery.

Hydraulic History

The U.S. Geological Survey (USGS) maintained a gaging station directly upstream from the Seward Highway crossing of the Resurrection River. Information from USGS Gage 15237700, which operated from October 1, 1964 to June 30, 1968, includes daily discharge data, daily, monthly and annual statistics, and 4 peak streamflows (USGS, 2015). A hydrograph of the gaging record is found in Figure 3.

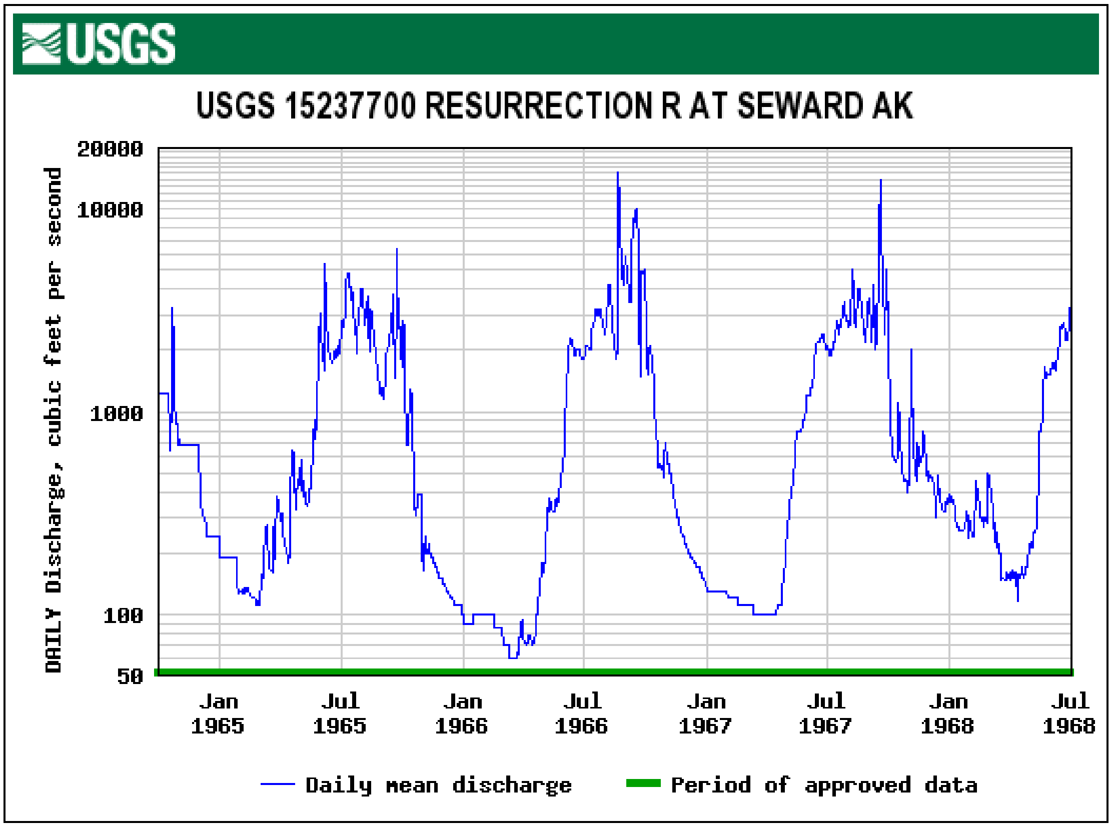

Figure 3. USGS gaging record for Resurrection River.

A hydrologic analysis was carried out in 2007 to establish peak discharge-frequency relationships for the Resurrection River. The analysis was conducted by Northwest Hydraulic Consultants, Inc. (NHC), which acted as a contractor to FEMA for the purposes of developing an updated Flood Insurance Study (FIS) for the Kenai Peninsula Borough (KPB). The analysis is described in a technical memo (NHC, 2007a). As no new stream gaging data has been collected in recent years, we utilized the existing FEMA flood frequency analysis.

NHC only provided flood magnitude estimations for the 10-year through 500-year floods. For this report, the 2-year and 5-year flood magnitudes were estimated using the techniques described in the NHC technical memo, and included in Table 1.

Table 1. Flood frequency estimations for Resurrection River (Total) to Seward Highway

Estimated Peak Flow (cfs)					
Q2	Q5	Q10	Q50	Q100	Q500
11663*	15943*	19230†	26190†	29160†	36570†

* estimated for this project using methods described in NHC (2007a).
† from NHC (2007a) for 2010 Kenai Peninsula Borough Flood Insurance Study

Long-term records indicate that on the average, the greatest monthly precipitation occurs in September and October. Discharge and flood records, such as Figure 3 and Appendix A also indicate that large floods generally occur in the later summer or autumn months. Coastal flooding is also an important climate characteristic of the Seward area, as high tides can increase the elevation and severity of Resurrection River flooding. Figure 4 illustrates seasonal variations in high tide levels, and indicates that extreme high tide levels are more likely to occur in the months from October through January.

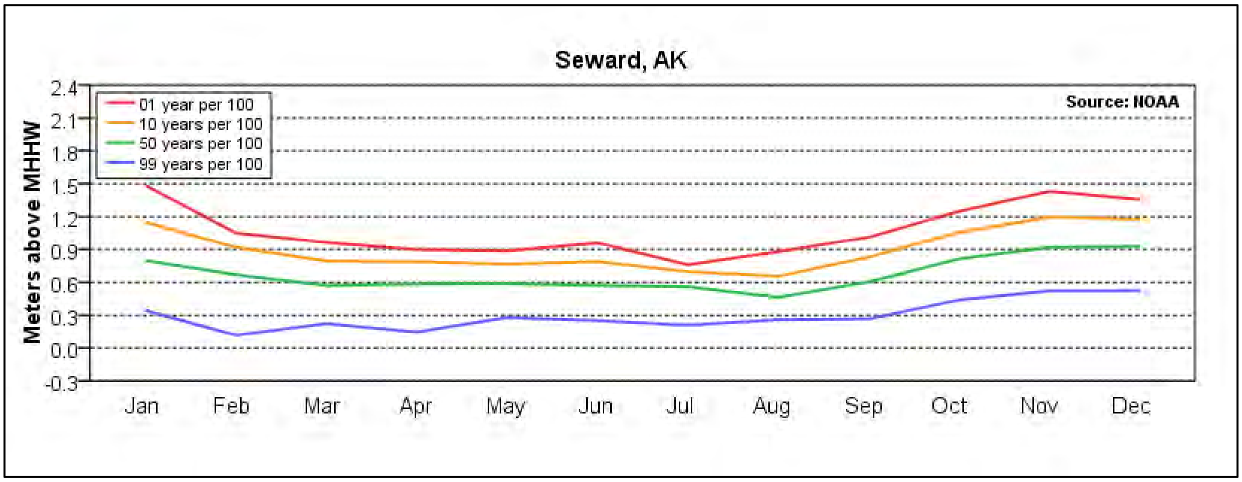

Figure 4. Seasonal variations of high tide exceedance probability levels at Seward. From NOAA (2015).

Floodplain Sediment Deposition

Some observers have noted that sections of the Resurrection River channel and floodplain have risen in elevation over time, especially in the area and downstream of where the main channel currently intersects Runway 13/31. Elevation rise has been attributed to large sediment transport rates in the Resurrection River during floods, and the subsequent deposition of that sediment within the channel and floodplain (Barber, 2006).

The potential rise in elevation is thought by some to be responsible for more frequent flooding of Runway 13/31. Potential backwater conditions in the lower reaches of the Resurrection River during high tide have also been suggested as a cause of gravel and sediment deposition (Task Force Report, 1998).

A study conducted by NHC in 2007 concluded that the bed elevation of the Resurrection River has remained fairly stable during the past 30 years. In a November 2007 memo prepared for

FEMA, NHC concluded that "Large depositional areas are not apparent along the Resurrection River in the area examined near the Seward Highway. Sediment probably has accumulated at various locations, but not in sufficient quantities to be revealed by the analysis completed here. It is likely that most sediment is transported through the reach and deposited on the delta in Resurrection Bay." (NHC, 2007b).

The selection of a design elevation to protect against flooding is dependent on accurately forecasting the change in the flood water surface profile during the course of the project design life. Though some channels in braided river systems move horizontally and vertically with time, the primary Resurrection River channel has been adjacent to the runway for many years. However, the location where the river intersects the runway embankment has been moving upstream with time. As a result, the distance the river flows adjacent the runway has been increasing with time. Additionally, the angle that the Resurrection River main channel initially intersects runway 13/31 has been increasing; in 2013 it was roughly perpendicular. See the series of historic aerial images in Appendix B.

Due to these changes and the braided nature of the river, the probability of runway embankment erosion adjacent to the river has been increasing with time. In 2013, significant erosion on the runway 13/31 embankment occurred for the first time since erosion protection was installed in 1996. Also in 2013, significant groundwater flow was noticed under the runway embankment and at this location the embankment live load capacity was reduced (Paul Janke, personal communication). As such, a new analysis was conducted to determine if the annual rate of sediment deposition and elevation change to the longitudinal profile of the Resurrection River channel could be established.

The following data sets were assessed for use in this analysis:

Table 2. Resurrection River topographic data sets.

Year	Data Available	Data Acquired For	Data Acquired From	Vertical Datum	Vertical Accuracy
1977	cross-sections	1981 FEMA FIRM	FEMA	NGVD 29	Unknown
2006	LiDAR	FIRM update, unfinished	Kenai Watershed Forum	NAVD 88	2-4 ft contour
2009	LiDAR	2012 FEMA FIRM update 2014 FIRM draft	Kenai Peninsula Borough	NAVD 88	2 ft contour
2014	LiDAR, surveyed channel cross-sections	ADOT Seward Improvement Project	PDC, Inc.	NAVD 88	0.268 ft*

*LiDAR Fundamental Vertical Accuracy at the 95% confidence interval. See Quantum Spatial, 2014.

To estimate the rise of the lower Resurrection River channel bed over time in the vicinity of the Seward Airport, several methods were considered, including an analysis of the channel thalweg data over time and a comparison of floodplain elevation data over time. However, problems with incompatible data sets prevented several proposed comparison methods.

For example, extensive and detailed surveys of the wetted channels along the cross-section lines, including the channel thalweg, were obtained in 2014 and used to supplement the 2014 LiDAR. Comparisons to historic thalweg elevations would have provided important information regarding channel stability. Both a technical memo from NHC and the 2013 FEMA Flood Insurance Study (FIS) indicates that cross-sections used in the 2010 FEMA HEC-RAS model "were cut from 2 ft contours provided by the KPB, and augmented with in-stream survey and bridge soundings completed during the period of October-December 2007 (NHC, 2008)." However, we compared the FEMA HEC-RAS cross-sections to sections cut directly from the 2009 LiDAR data and found them identical, even through the main channels. This indicates that the wetted channels were not surveyed, and that the main channel and thalweg elevations shown in the FEMA HEC-RAS cross-sections were in fact water surface elevations measured by LiDAR, which cannot penetrate water. The HEC-RAS cross-section locations are found in Appendix C, and the 2009 and 2014 cross-sections are plotted and found in Appendix D.

Though cross-sections were originally scheduled to be surveyed to supplement the 2006 LiDAR, high water conditions prevented in-water cross-section surveys below the Seward Highway bridges (personal communication, Nick Cline, Cline & Associates, Seward). We were also unable to obtain detailed descriptions of how the 1977 cross-sections were obtained. Therefore, direct comparisons of the 2014 cross-section thalweg to the historic data sets were not possible.

LiDAR data sets of the lower Resurrection River are available for 3 years: 2006, 2009, and 2014. Volumetric changes between the topographic surfaces would provide important information regarding sediment deposition. However, the vertical accuracy of the 2006 LiDAR dataset was substantially less than the accuracy of the 2009 and 2014 LiDAR. Therefore, the sediment deposition analysis consisted of an examination of floodplain elevation changes from 2009 to 2014.

Using a GIS, elevation values from the 2014 and 2009 LiDAR datasets were compared and used to create a gridded elevation layer that calculates and illustrates the elevation difference between the two layers. As LiDAR cannot penetrate water surfaces, estimated elevation changes for a given area may be meaningless if water covered that area during the acquisition of either LiDAR dataset. Therefore, the wetted channel locations of both LiDAR datasets were blacked out of the gridded elevation difference map. See Figure 5.

Results show that though much of the Resurrection River floodplain downstream of the Seward Highway has remained unchanged, significant elevation changes have occurred at some locations. Upstream of the runway/main channel intersection, some deposition between 1 to 2 feet has occurred on both banks. Several smaller areas, notably on the right bank, also show deposition of 3 to 4.5 feet. In addition, some areas show a decrease in elevation from 2009 to 2014, as large as 3 feet.

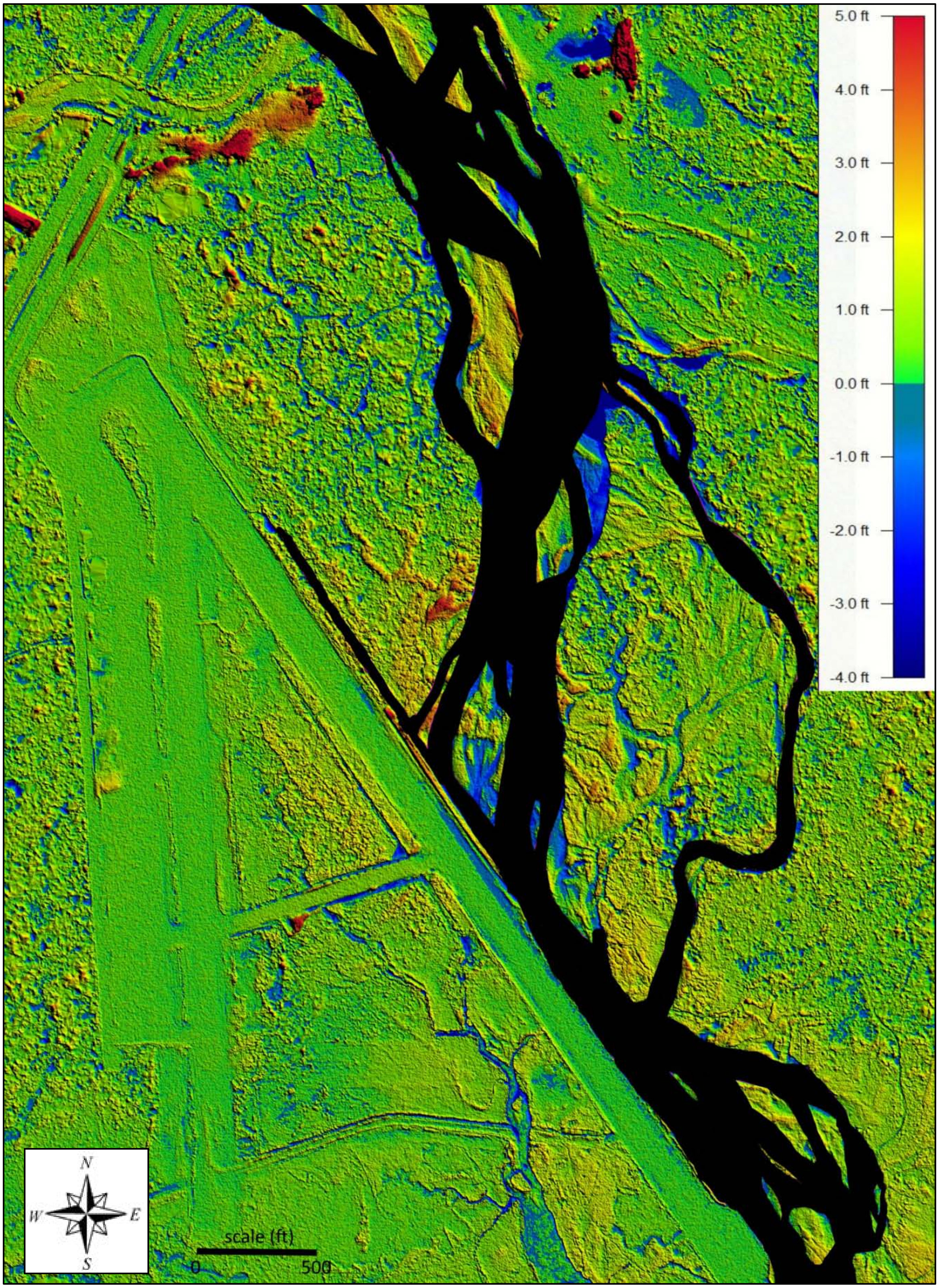

Figure 5. Elevation change from 2009 to 2014.

Between Runways 13/31 and 16/34, an elevation increase of 1 to 2 feet is observable upstream of the cross-taxiway. Sediment deposition in this area may have occurred following overtopping of Runway 13/31 by sediment-laden floodwater.

It is important to note that when considering floodplain elevation changes over time, conditions immediately prior to the acquisition of the elevation data (in this case, LiDAR) may have varied significantly from 2009 to 2014. For example, the passage of a large flood will likely result in significant sediment deposition; however, the area of deposition on the floodplain may vary depending on if a high tide occurred coincident to the flood event. Though the elevation datasets are named ‘2009’ and ‘2014,’ it is important for the reader to remember that the datasets are snapshots in time, and direct elevation comparisons for different years should be considered as approximate.

During the project team field trip to the Seward Airport on July 10, 2014, we observed the large pile of gravel sitting in the middle of the Resurrection River approximately 1600 ft upstream from the 13/31 runway. This material is part of a 350,000 yd^3 excavation that occurred following the 1995 flood as an effort to re-direct the river back to its pre-1995 channel. It is unknown if the excavated 350,000 yd^3 was placed in one pile or several.

The pile is actively eroding as the main channel is scouring the toe, and a steep face of freshly exposed gravel was clearly visible. See Figure 6. D. Mahalak (KPB) noted the possibility that material eroding from the large pile is likely being carried downstream, and may possibly be deposited near the runway embankment (personal communication, July 10, 2014).

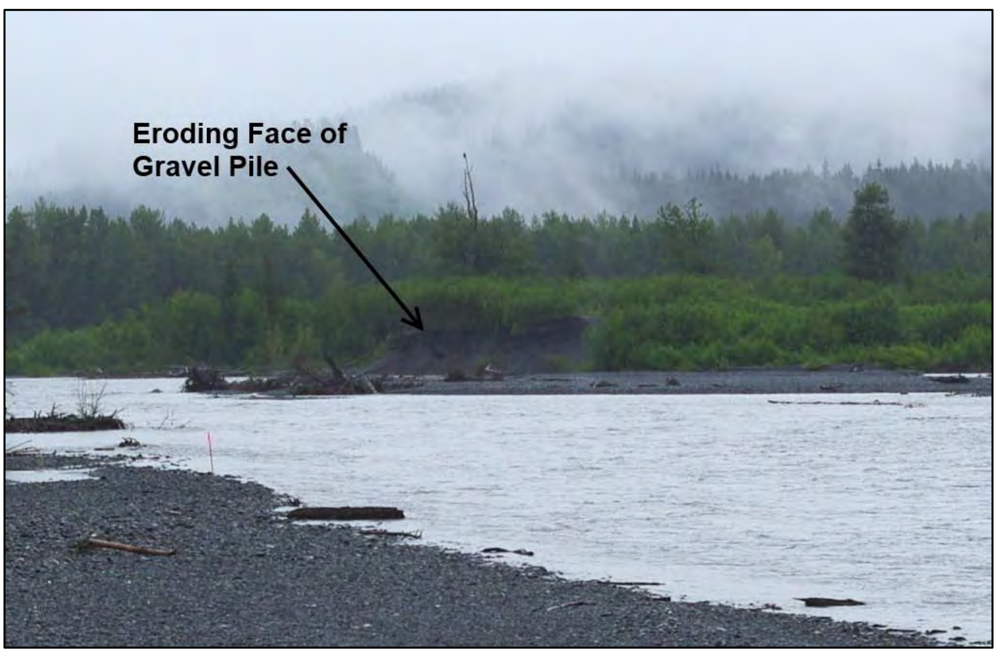

Figure 6. Photograph of eroding gravel pile on Resurrection River floodplain upstream of runway, taken July 10, 2014.

The gravel pile is located approximately 2400 ft downstream from the Seward Highway Bridge, and approximately 1600 ft upstream of the Seward Airport runway. The pile is approximately 20 feet higher than the adjacent floodplain. See Figure 7.

Changes to the pile may also be seen on Cross-section K, shown in Appendix D, which is aligned through the upper area of the pile. In 2007, the pile is distinct, with a top elevation of almost 35 feet. By 2014, the pile is no longer visible along Cross-section K.

To assess how erosion is affecting the gravel pile, AutoCad Civil3d was used to estimate the volume and footprint area of the pile for the three years that LiDAR data was obtained: 2006, 2009, and 2014. Results indicate that the gravel pile volume has decreased in size from 2006 to 2014 by 80 percent. LiDAR imagery illustrating the ongoing erosion at the gravel pile is found in Figure 8.

Table 3. Changes to gravel stockpile.

	Stockpile Volume Remaining On Floodplain (yd^3)	Stockpile Footprint (acres)
2006	41,593	2.41
2009	35,083	1.78
2014	8,345	0.43

Figure 7. Location of eroding gravel pile.

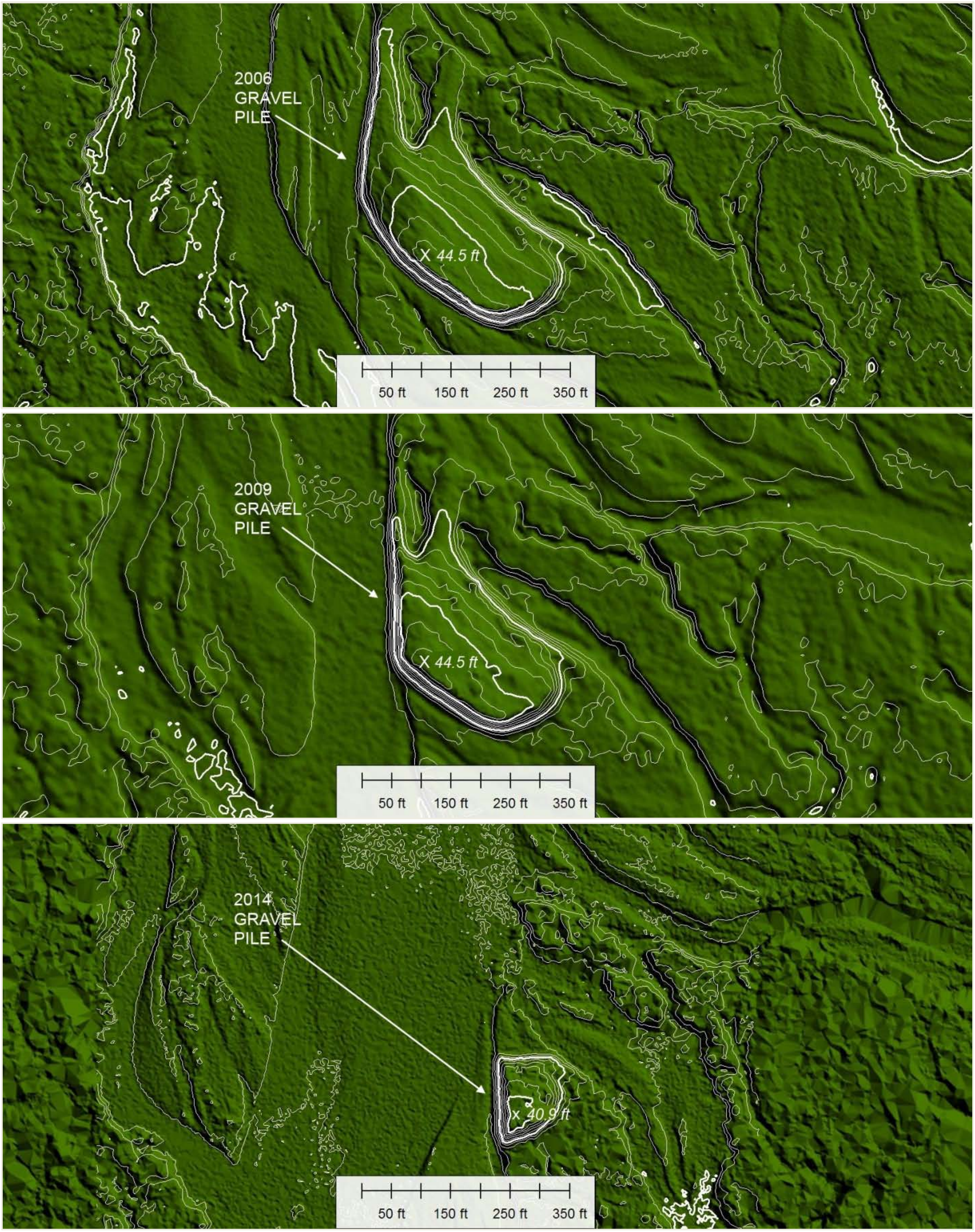

Figure 8. Changes to gravel stockpile over time. Top 2006, middle 2009, bottom 2014.

Hydraulic Modeling

A hydraulic model was used to analyze the water surface profile of flood events and determine the potential water surface elevation, scour depth and the range of hydraulic forces acting on three design alternatives developed for this project. The HEC-RAS software package was used for this analysis. Cross-sections used in the model are shown in Appendices C and D.

The HEC-RAS program is one-dimensional, meaning that there is no direct modeling of the hydraulic effect of cross section shape changes, bends, and other two- and three-dimensional aspects of flow. However, the system can handle a full network of channels, a dendritic system, or a single river reach, and the steady flow component is capable of modeling subcritical, supercritical, and mixed flow regimes water surface profiles.

The HEC-RAS analysis was conducted by performing the following tasks:

- The HEC-RAS model developed by NHC for the 2010/2013 FIS was obtained for the new analysis and modified for use in the following manner:
- Cross-sections are numbered in order from downstream to upstream, starting at River Station 144 (Cross-section A) near the Resurrection Bay coastline upstream to River Station 16456.78 (Cross-section AE)
- Fifteen cross-sections in the project area, from River Station 144 (Cross-section A) to River Station 7482 (Cross-section O) just downstream of the Seward Highway Bridges were updated with new topographic information from LiDAR acquired in 2014.
- Cross-sections from River Station 7689.403 (at the Seward Highway bridges) upstream to River Station 16456.78 were unchanged, and left in the model.
- All cross-section alignments, including the updated 15 cross-sections, matched those used for the 2010 FIS HEC-RAS analysis.
- All 15 of the updated cross-sections traverse the mapped 1% chance (100-year) floodplain; of the updated sections, only cross-sections from River Station 3589 (G) through River Station 7482 (O) traverse the mapped Regulatory Floodway.[1]
- As LiDAR imagery does not include channel information below the water surface, the wetted channel perimeters along the updated cross-sections were surveyed in 2014 by a PDC survey team using standard methods. The channel surveys were ‘cut’ into the LiDAR cross-sections to improve the topographic accuracy and provide actual channel shape and thalweg data.
- New dikes constructed upstream of the Seward Highway between 2009 and 2014 were surveyed by the PDC survey team and used to update the model.
- In addition to an Existing Ground (EG) model, design models included Alt 1.1, 2.2, and 3.0. The model runway geometries were based on Civil3D surfaces provided by PDC. See Table 4.
- Manning’s n roughness values were selected based on recent project imagery and site visits, published values for similar conditions, and engineering judgment (Chow, 1959

[1] The “Regulatory Floodway” means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

and others). See Table 5.

- The design discharge is the 100-year flood. Model runs included the 2-, 5-, 10-, 50-, 100- and 500-year floods. Additional modeling was conducted to determining the low-flow runway overtopping condition.
- Model results also incorporated coastal flooding effects from the 1-percent-annual chance tide event, which govern up to Cross-section E on the Resurrection River.
- Design models included a modeled 'levee' to prevent flood water from flowing westward between the Seward Highway/Alaska Railroad tracks and the upper end of the runway embankments.

Table 4. HEC-RAS models.

Model	Features
Existing Ground (EG)	Existing runway/taxiway embankments as of July 2014.
Low Flow Runway Overtopping	Existing runway/taxiway embankments as of July 2014. Flow restricted to main channel to determine what flow level initiates Runway 13/31 overtopping.
Alternative 1.1	Reconstruct Runway 13/31 (4533 x 75 ft) with 2-ft freeboard above Q100. Install armor to protect runway 13/31. Adjust Runway 16/34 profile to match into raised Runway 13/31. Reconstruct Taxiway B & C to match into runway modifications. Eliminate Taxiways A, D & E.
Alternative 2.2	Reconstruct Runway 16/34 (3300 x 75 ft) with 2-ft freeboard above Q100. Abandon Runway 13/31 and install armor to prevent embankment erosion and channel migration. Relocate Taxiway B to match into runway modifications. Reconstruct Taxiway F to match into runway modifications. Eliminate Taxiways A, C, D, & E.
Alternative 3.0	Reconstruct Runway 16/34 (4000 x 75 ft) with 2-ft freeboard above Q100. Install armor to protect Runway 16/34. Abandon Runway 13/31 and allow flooding to overtop runway. Relocate Taxiway B & F to match into runway modifications. Eliminate Taxiways A, C, D & E.

Note that in Alternative 3.0, Runway 13/31 will be abandoned and is expected to erode over time. The Alt 3.0 HEC-RAS model geometry included the full Runway 13/31 embankment, and did not consider the effects of embankment erosion. Such embankment erosion would likely lead to lower water surface elevations over time than what is shown in the following modeling results.

Table 5. Manning's n values used in HEC-RAS models.

Manning's n Values					
channel	floodplain			pavement gravel roads	riprap
	tall grass	short shrub	tall shrub, trees		
0.035	0.08	0.10	0.15	0.015	0.06

Low Flow Runway Overtopping

One of the initial concept alternatives was Alt 1.2. Compared to Alt 1.1, this alternative would reconstruct runway 13/31 but would not raise the runway elevation. This solution would reduce potential impacts within the Regulatory Floodway but would mean the runway would be flooded on a frequent basis.

As discussed, observers have noted that Runway 13/31 has been frequently overtopped in recent years, and the rate of overtopping appears to be increasing. In 2013, the runway was overtopped an estimated 10 times (Paul Janke, personal communication). The increased frequency indicates that lower flowrates, rather than only major floods, are now capable of flooding the runway. To help evaluate the feasibility of Alt 1.2, it was necessary to estimate the amount of time the runway may be overtopped in any given year. To determine overtopping frequency, the following analysis was conducted.

The 2014 EG HEC-RAS model was utilized to determine the rate of flow required to initiate overtopping of Runway 13/31. Within the model, the flow was generally restricted to the main channel; however, based on field observations at the time of low-flow runway flooding, some flow was permitted in the smaller side channels that flow to the east of the main Resurrection River channel (Paul Janke, personal communication). A temporary levee constructed in the fall of 2013 along the lower runway embankment was not included in the model.

Based on the HEC-RAS modeling, runway overtopping begins in the vicinity of Cross-section I (River Station 4460) and extends to Cross-section H (River Station 3950) as the water rises. An existing levee and high ground adjacent to the runway protect it upstream of Cross-section I from flooding at low flows.

Because of the lack of precision in a one-dimensional hydraulic model, a range of overtopping flows was bracketed rather than selecting a single discharge. Based on the HEC-RAS modeling, initial overtopping begins at Cross-section I at a discharge of 3500-4500 cfs. At 6500 cfs, overtopping is also noted at Cross-section H. See Figure 9.

The second part of the analysis involved the use of existing daily discharge data to estimate the percentage of time that the overtopping flows occur in a year. A flow duration curve displays the relationship between streamflow and the percentage of time it is exceeded. Flow duration curves are derived using all data, rather than just high or low flows.

The U.S. Geological Survey (USGS) maintained a gaging station (15237700) directly upstream from the Seward Highway crossing of the Resurrection River. Daily discharge data from October 1, 1964 to June 30, 1968 were used to construct the flow duration curve. Each discharge in the period of record was ranked based on the total number of days in the record. For each ranking, the exceedance probability, or percent of time that each discharge is equaled or exceeded was calculated. See Figure 10.

A streamflow of 3500 cfs will be equaled or exceeded 5.62% in a given year, which is 20.5 days. A streamflow of 4500 cfs will be equaled or exceeded 3.21% in a given year, which is 11.7 days. Based on the available daily discharge record and the HEC-RAS model, the analysis indicates that Runway 13/31 will be overtopped between 12 and 21 days a year.

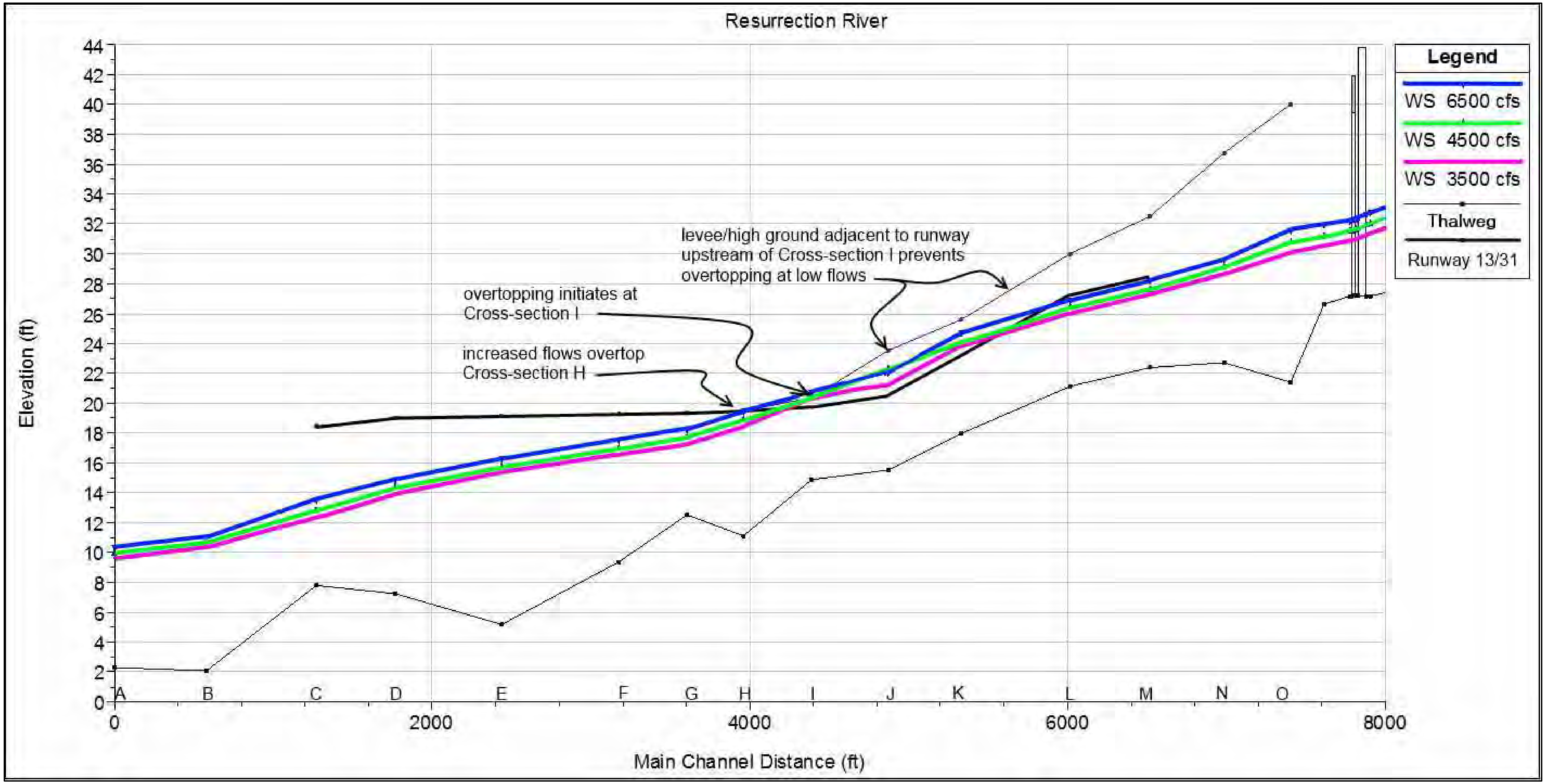

Figure 9. HEC-RAS results for runway overtopping.

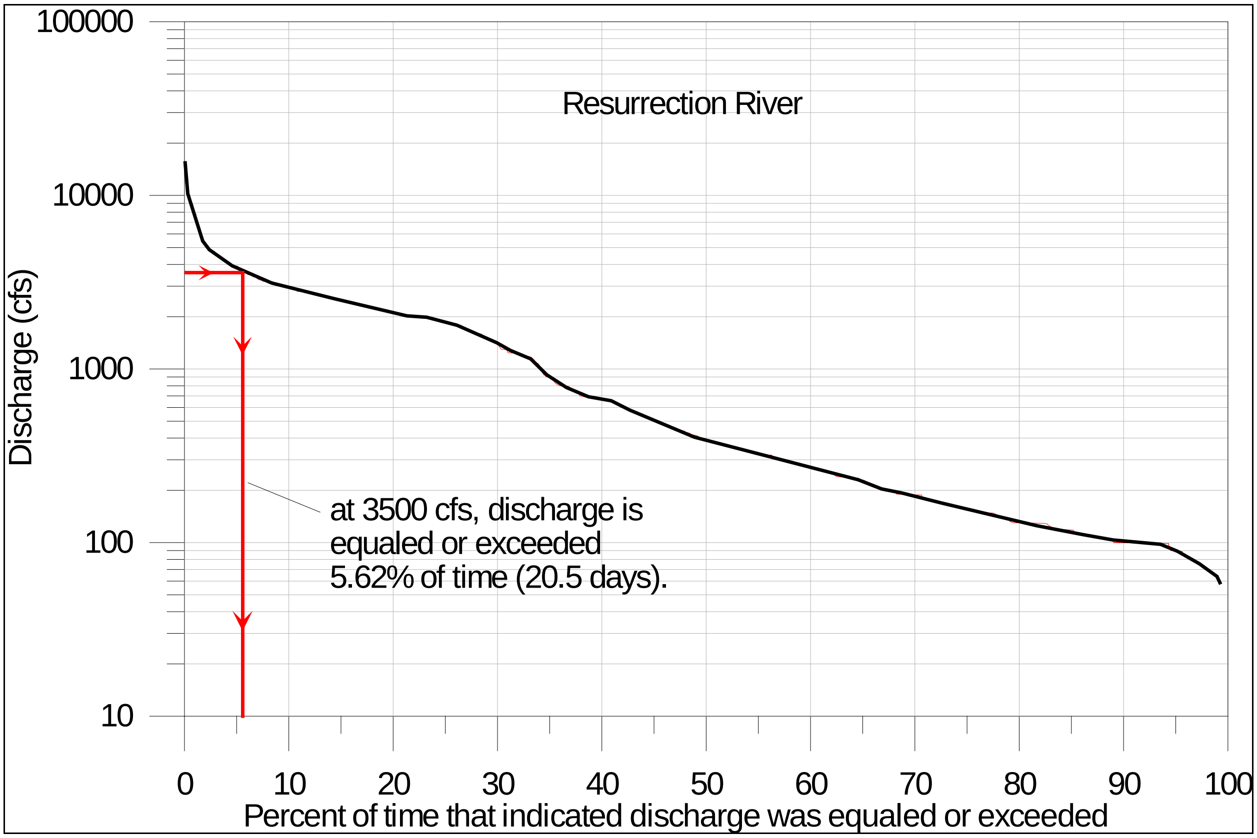

Figure 10. Flow duration curve for the Resurrection River.

Variations in weather patterns will affect the overtopping frequency at Runway 13/31. The long-term (1908-2014) Seward precipitation record shows that the 1964-1968 time period covered by the daily discharge data used to construct the flow duration curve experienced low to average precipitation. See Appendix E for the long-term Seward precipitation record. Had the daily discharge data used for the flow duration curve been obtained during a period of average precipitation, overall river discharge would have likely been greater.

In addition, future years with higher than normal precipitation will experience even more runway overtopping. For example, the months of May, July, August and October 2013 had significantly more precipitation than the long-term monthly averages, twice as much or more. The runway was overtopped an estimated 10 times in 2013. As the analysis is based on stream flow data collected during a time period of lower-than-average precipitation, the model likely underestimates the number of overtopping events.

Other climatic and hydrologic factors, such as warmer than average summer temperatures, rising floodplain elevations, and debris dam breach floods will also likely increase the frequency of overtopping events.

Based on this and other analyses, this option allowing runway overtopping was not carried forward for further, more detailed review because it was considered to be impractical; the runway would be unreliable and the costs for construction were estimated to be as much as 50% higher. M&O costs would be substantially higher than Alt 1.1 to account for frequent clearing of the debris after each overtopping event plus likely additional costs in pavement and airport lighting repairs.

Hydraulic Analyses Results for Design Alternatives

HEC-RAS results for the Existing Conditions and Alternatives 1.1, 2.2 and 3.0 are found in Table 6. For each cross-section, results include: average channel velocity, the water surface elevation, freeboard (based on preliminary design elevations for each alternative), and the increase of the water surface elevation from the EG model. Flood height increases of more than 1 foot are highlighted in bold red text.

Note that minimum federal standards limit flood height increases to 1 foot, provided that hazardous velocities are not produced. Additionally, the KPB has developed a floodplain ordinance that regulates construction and improvements in flood hazard areas. The Borough Floodplain Development Ordinance (KPB, 1986) prohibits any increase in flood levels during the base flood that result from fill, construction and other development within the regulatory floodway.[2] This no-net-rise policy applies to areas both upstream and downstream of any floodway encroachment. Note that of the three proposed design alternatives described in this report, only Alternative 1.1 involves development within an existing regulatory floodway.

The results in Table 6 include the results from coastal flooding from Resurrection Bay. The 100-year coastal flooding elevation of 16.2 feet at the Resurrection Bay in Seward is taken from the 2013 FIS (FEMA, 2013).

Additional HEC-RAS result tables, including the 500-year flood elevations, and comparisons of the elevations with and without coastal flooding, are found in Appendix F.

Comparison graphs of the 100-yr water surface profiles for the Alt 1.1, Alt 2.2 and Alt 3.0 models to the EG profile are found in Figures 11, 12, and 13.

For the four HEC-RAS models (existing conditions plus the three alternatives), floodplain maps for the 100-year flood were developed using the RAS Mapper floodplain mapping tool, and are found in Figures 14, 15, 16, and 17. The four figures include the 100-year floodplain boundaries from the EG HEC-RAS model; the 100-year floodplain coverage for Alt 1.1, 2.2, and 3.0; private parcel locations on the floodplain; cross-section lines; the locations of the two regulatory floodways (Resurrection River and Salmon Creek) from the 2013 FIRM; and the boundaries of the 1% annual chance (100-year) floodplain from the 2013 FIRM.

The full output results for the four HEC-RAS models are found in Appendix I.

[2] The “base flood” is the flood having a one percent chance of being equaled or exceeded in any given year. This is the regulatory standard also referred to as the "100-year flood" or the “1% annual chance flood.”

Table 6. Preliminary results for HEC-RAS modeling, including Existing Ground (EG) and Alternatives 1.1, 2.2, and 3.0. Results are based on the 100-year flood, and include the effects of coastal flooding (100-yr) from Resurrection Bay.

	EG				ALT 1.1					ALT 2.2					ALT 3.0				
Cross-Section &River Sta	R/W 13/31 Elev (ft)	R/W 16/34 Elev (ft)	Vel Chnl (ft/s)	W.S. Elev (ft)	R/W 13/31 Elev (ft)	Vel Chnl (ft/s)	W.S. Elev (ft)	Free-board (ft)	Elev Increase From EG (ft)	R/W 16/34 Elev (ft)	Vel Chnl (ft/s)	W.S. Elev (ft)	Free-board (ft)	Elev Increase From EG (ft)	R/W 16/34 Elev (ft)	Vel Chnl (ft/s)	W.S. Elev (ft)	Free-board (ft)	Elev Increase From EG (ft)
A 144	-	-	3.49	16.20	-	3.49	16.20	-	0.0	-	3.49	16.20	-	0	-	3.49	16.20	-	0.0
B 698	-	-	6.52	16.20	-	6.52	16.20	-	0.0	-	6.52	16.20	-	0	-	6.52	16.20	-	0.0
C 1336	18.47	-	1.00	16.20	19.08	9.43	16.20	2.88	0.0	-	1.00	16.20	-	0	18.91	1.59	16.20	2.71	0.0
D 1791	18.99	-	2.67	16.20	20.40	5.53	17.58	2.82	1.38	18.96	3.96	16.20	2.76	0	19.00	3.44	16.20	2.80	0.0
E 2432	19.15	-	3.41	16.20	22.00	6.68	19.10	2.90	2.9	19.70	4.12	16.20	3.50	0	19.58	4.09	16.20	3.38	0.0
F 3094	19.26	16.60	5.29	17.12	23.77	3.26	21.16	2.61	4.04	20.66	3.66	17.90	2.76	0.78	20.74	3.65	17.91	2.83	0.79
G 3589	19.31	20.33	6.32	19.15	24.54	4.70	22.02	2.52	2.87	22.10	5.30	19.59	2.51	0.44	22.17	5.28	19.58	2.59	0.43
H 3950	19.47	20.68	4.95	20.98	25.38	5.06	22.74	2.64	1.76	23.68	5.07	21.16	2.52	0.18	23.68	4.90	21.11	2.57	0.13
I 4460	19.59	21.27	4.70	22.24	26.38	5.64	23.63	2.75	1.39	25.12	5.16	22.52	2.60	0.28	25.15	5.09	22.45	2.70	0.21
J 4994	20.58	23.04	5.53	24.00	27.57	6.18	25.02	2.55	1.02	26.86	5.65	24.25	2.61	0.25	26.83	5.72	24.21	2.62	0.21
K 5408	23.27	24.66	5.10	25.77	29.27	5.37	26.56	2.71	0.79	28.71	5.24	25.94	2.77	0.17	28.62	5.38	25.97	2.65	0.20
L 6068	27.05	27.05	6.35	28.31	31.47	6.70	28.71	2.76	0.40	31.19	7.16	28.56	2.63	0.25	31.15	7.03	28.6	2.55	0.29
M 6545	-	-	7.62	30.21	33.00	7.18	30.51	2.49	0.30	-	6.96	30.55	-	0.34	-	7.00	30.54	-	0.33
N 7067	-	-	9.21	32.52	33.86	9.28	32.49	1.37	-0.03	-	9.49	32.42	-	-0.10	-	9.47	32.43	-	-0.09
O 7482	-	-	3.65	35.58	-	3.64	35.59	-	0.01	-	3.62	35.62	-	0.04	-	3.62	35.62	-	0.04

* note: yellow shading indicates that the cross-section traverses the Resurrection River Regulatory Floodway.

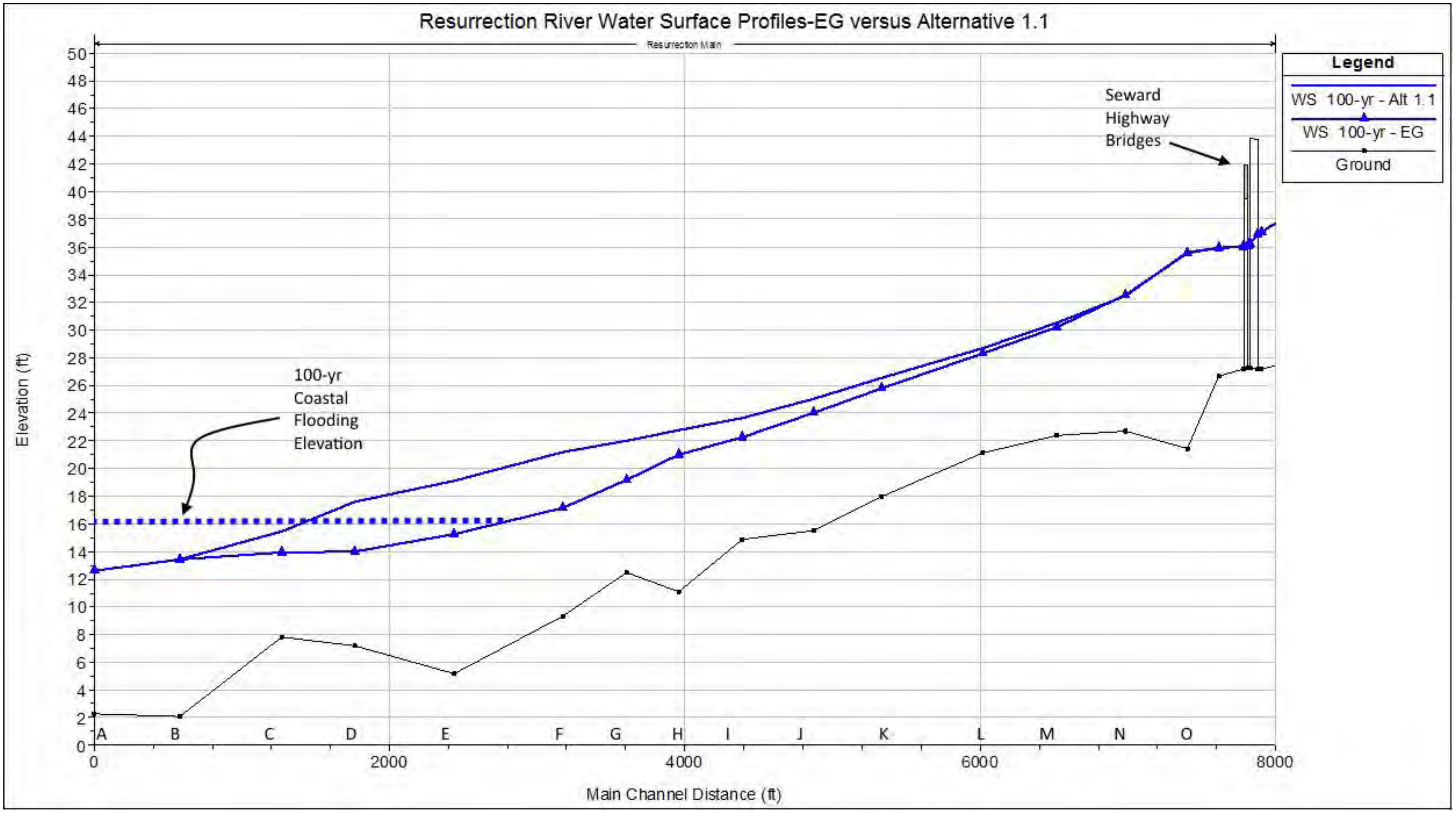

Figure 11. 100-yr water surface profile for EG and Alt 1.1.

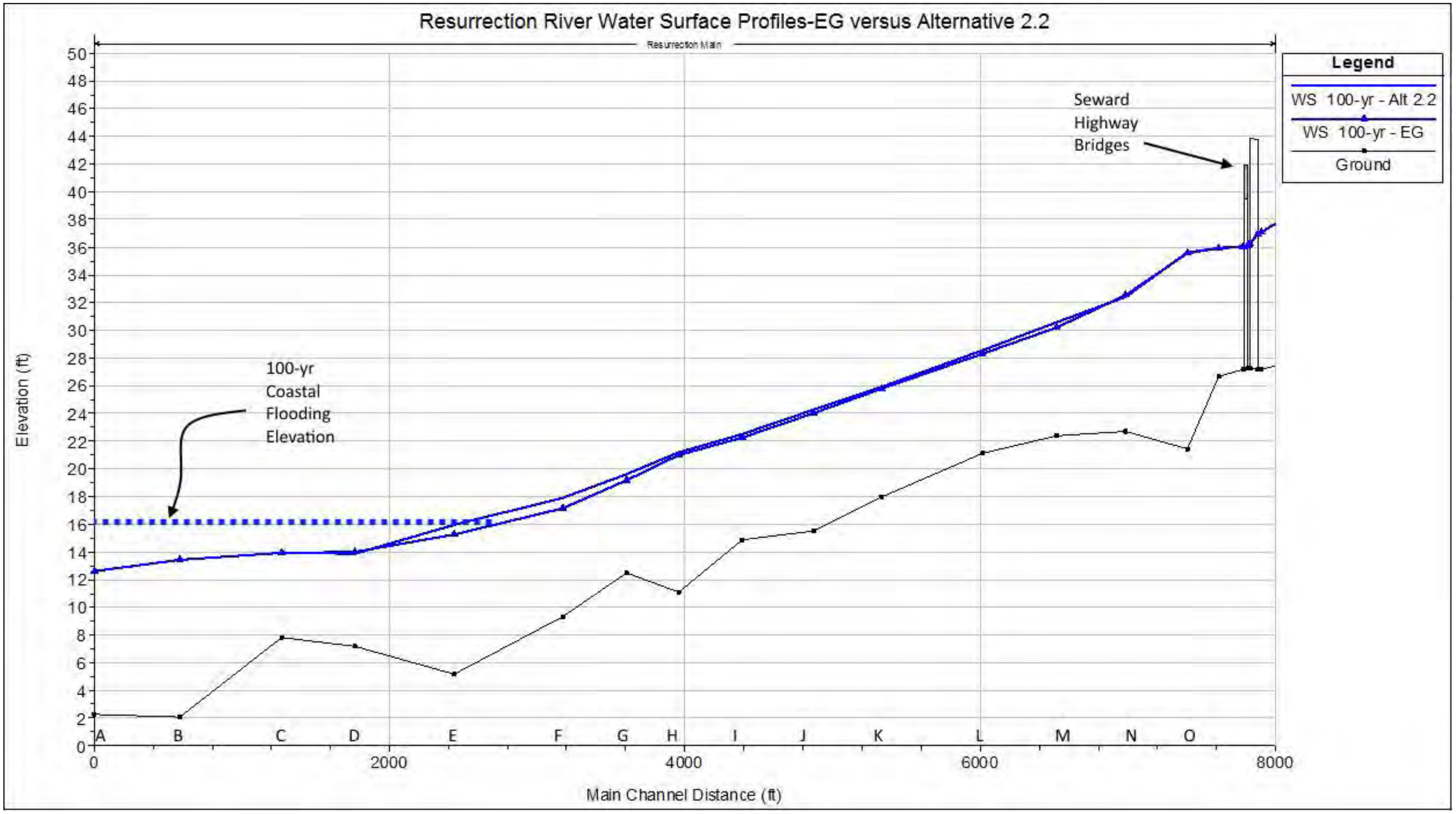

Figure 12. 100-yr water surface profile for EG and Alt 2.2.

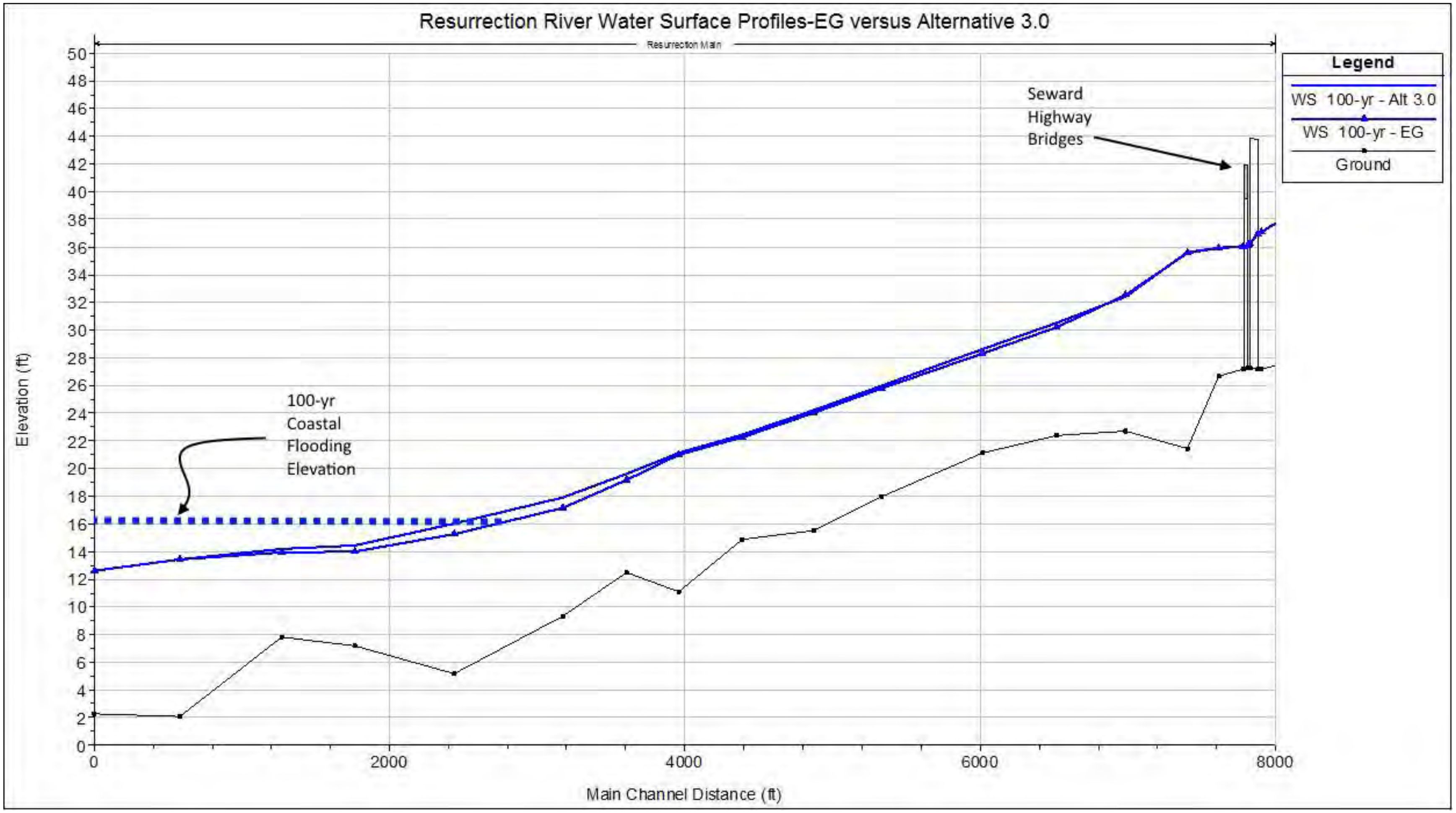

Figure 13. 100-yr water surface profile for EG and Alt 3.0.

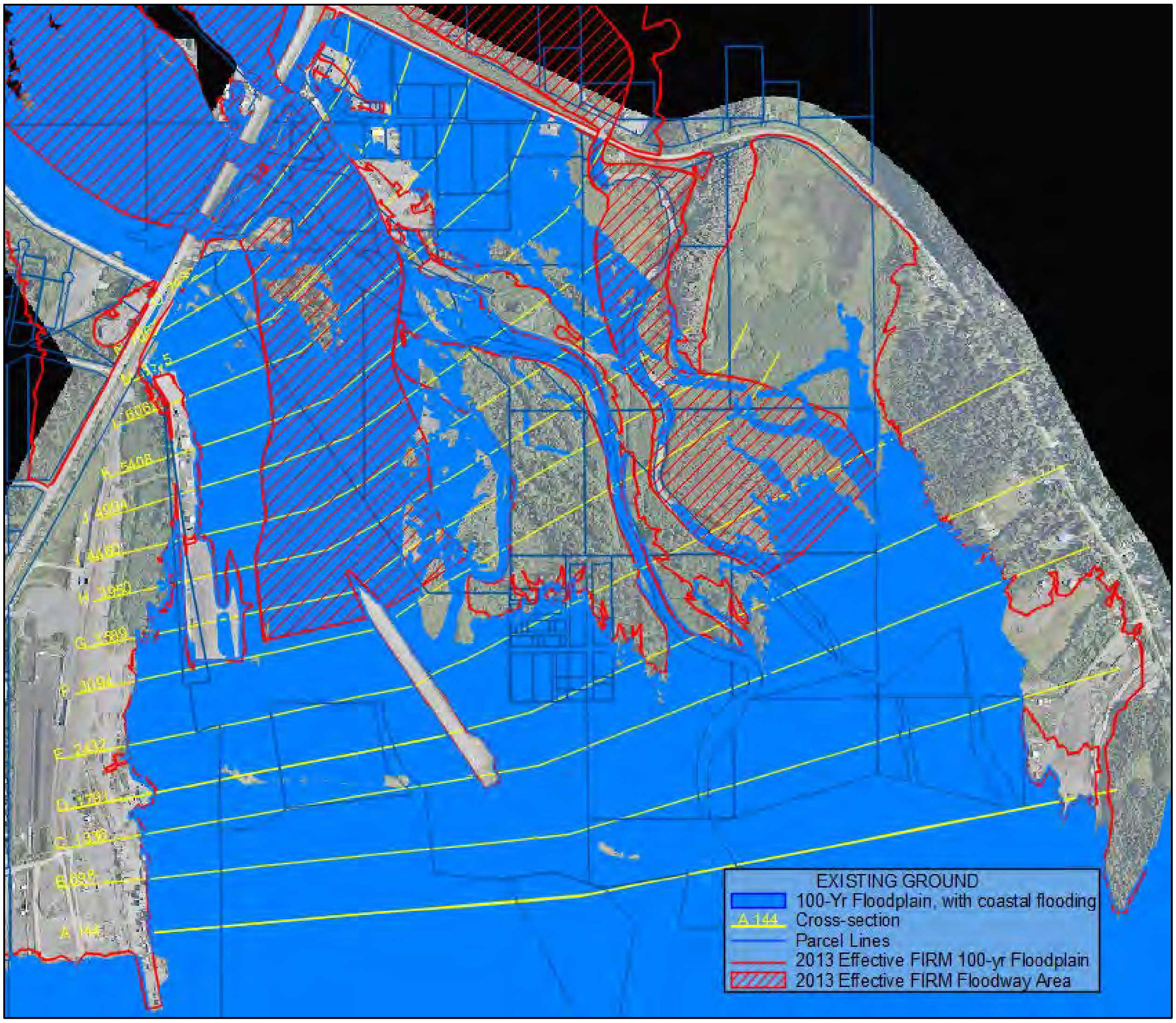

Figure 14. 100-year flood map for Existing Ground.

EG-Figure 14 shows that the 100-year flood will inundate most of the Seward Airport, including the upper half of Runway 13/31 and most of Runway 16/34. The private parcels in the middle of the Resurrection River floodplain are almost completely inundated as well, but that inundation is primarily due to the effects of coastal flooding from the 1-percent-annual chance tide event, which govern up to Cross-section E on the Resurrection River. The 100-year flood map in Figure 14 matches closely with the FEMA FIRM 100-year flood map. The 100-year floodplain downstream from the Seward Highway includes the FIRM Panels 4543, 4544, 5006, and 5007, found in Appendix H.

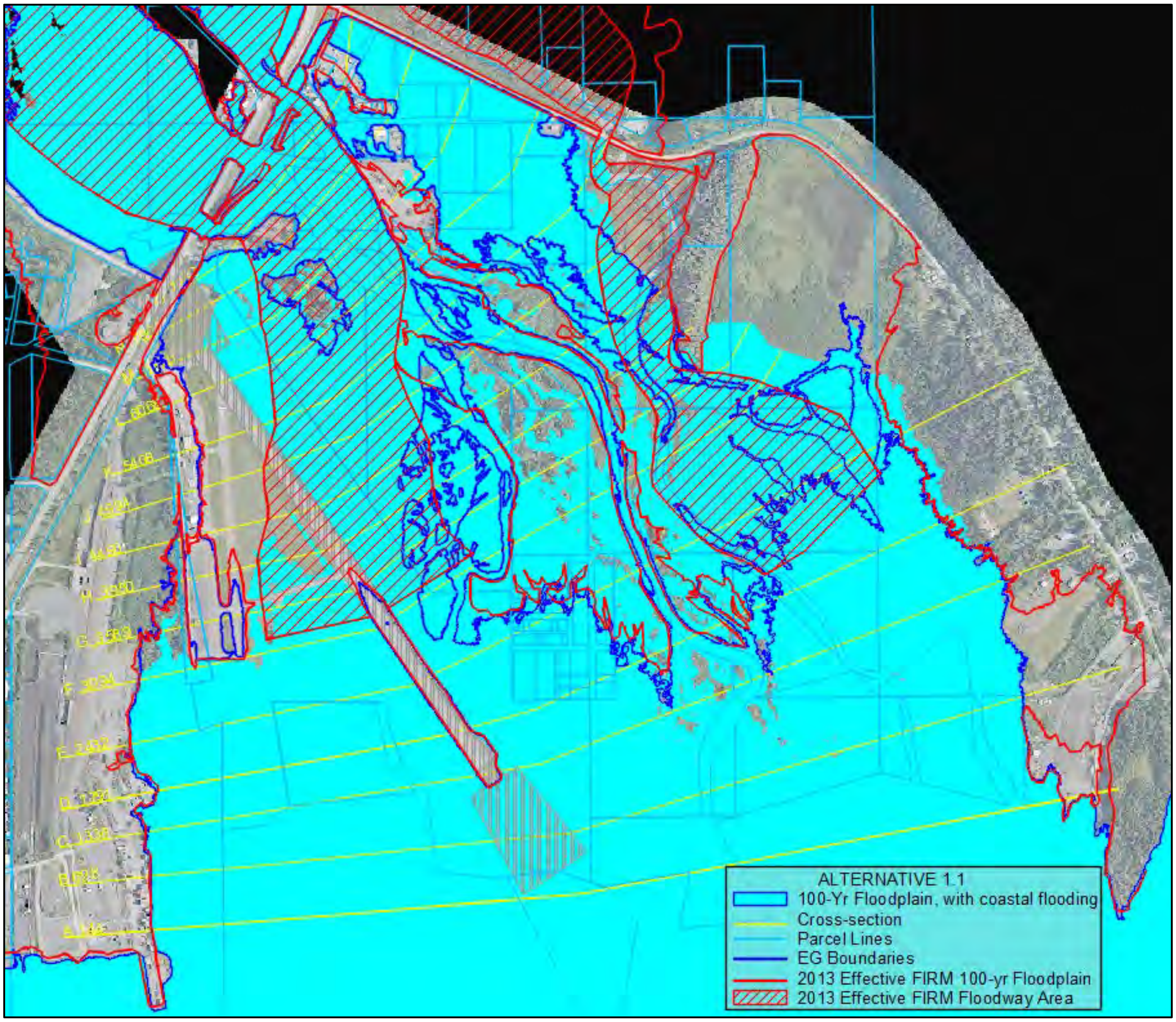

Figure 15. 100-year flood map for Alternative 1.1.

Alt 1.1-This design alternative raises the elevation of Runway 13/31 above the 100-year flood with a 2-ft freeboard. Both runways remain above the base flood elevation. The Alt 1.1 water surface elevations across the floodplain east of the runway are substantially higher than those of the EG model. Water surface elevation increases of greater than 1 foot occur from Cross-section D to Cross-section J. The maximum water surface elevation increase is 4.04 feet, and occurs at Cross-section F. The private parcels in the middle of the Resurrection River floodplain are completely inundated. At some areas of the 100-year floodplain between the Seward Highway and Resurrection Bay, the eastern limit has expanded. At Cross-sections D and E, the Alt 1.1 floodplain boundary is 70 feet to the east of the Effective FIRM floodplain (red line). At Cross-sections F and G, the Alt 1.1 floodplain boundary is 300 to 500 feet east of the EG model boundary (dark blue line). Though it is within the Salmon Creek Effective FIRM floodplain Zone AH, the Alt 1.1 water surface elevations of Cross-sections F and G are slightly higher (1-2 feet) than the FIRM base flood elevations there. At Cross-section K, the Alt 1.1 floodplain boundary is approximately 400 feet northeast of the EG model boundary, but still within the Salmon Creek Effective FIRM base flood and floodway boundary. See FIRM Panel 4544.

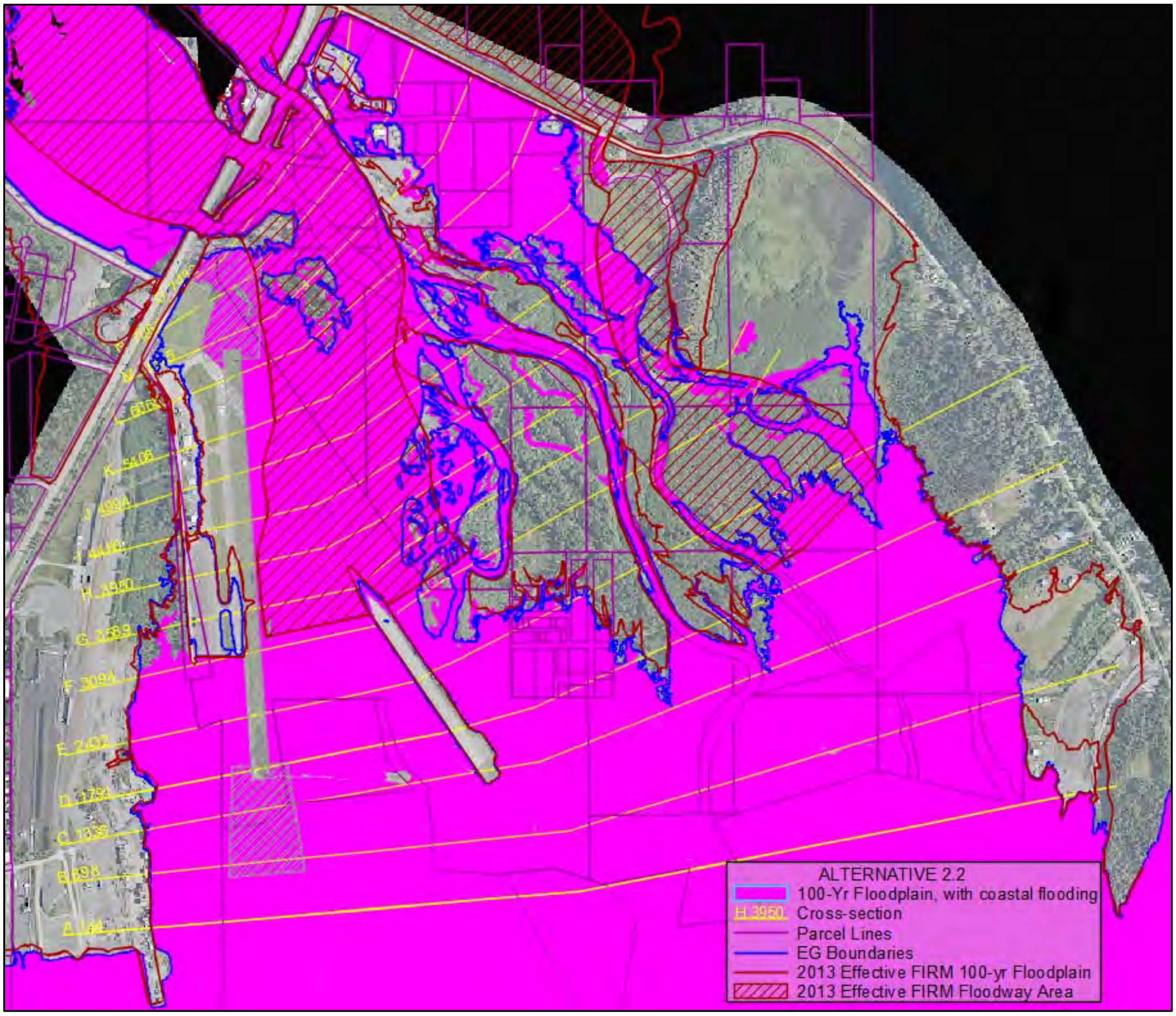

Figure 16. 100-year flood map for Alternative 2.2.

Alt 2.2-This design alternative reconstructs Runway 16/34 and raises the elevation with a 2-ft freeboard above the 100-year flood. Though Runway 13/31 is abandoned for active aircraft use, it is armored to prevent embankment erosion and channel migration.

Water surface elevation increases of less than 1 foot occur from Cross-section F to Cross-section M. The maximum water surface elevation increase is 0.78 feet, and occurs at Cross-section F. The private parcels in the middle of the Resurrection River floodplain are partially inundated. At some areas of the 100-year floodplain between the Seward Highway and Resurrection Bay, the eastern limit has slightly expanded. At Cross-section F, the Alt 2.2 floodplain boundary is 160 feet east of the EG model boundary (dark blue line); a low spot in Cross-section G 200 feet east of the EG boundary is inundated. These locations are within the Salmon Creek Effective FIRM floodplain Zone AH; however, the Alt 2.2 water surface elevations of Cross-sections F and G are lower than the FIRM base flood elevations there. At Cross-section K, the Alt 1.1 floodplain boundary is approximately 400 feet northeast of the EG model boundary, but still within the Salmon Creek Effective FIRM base flood and floodway boundary.

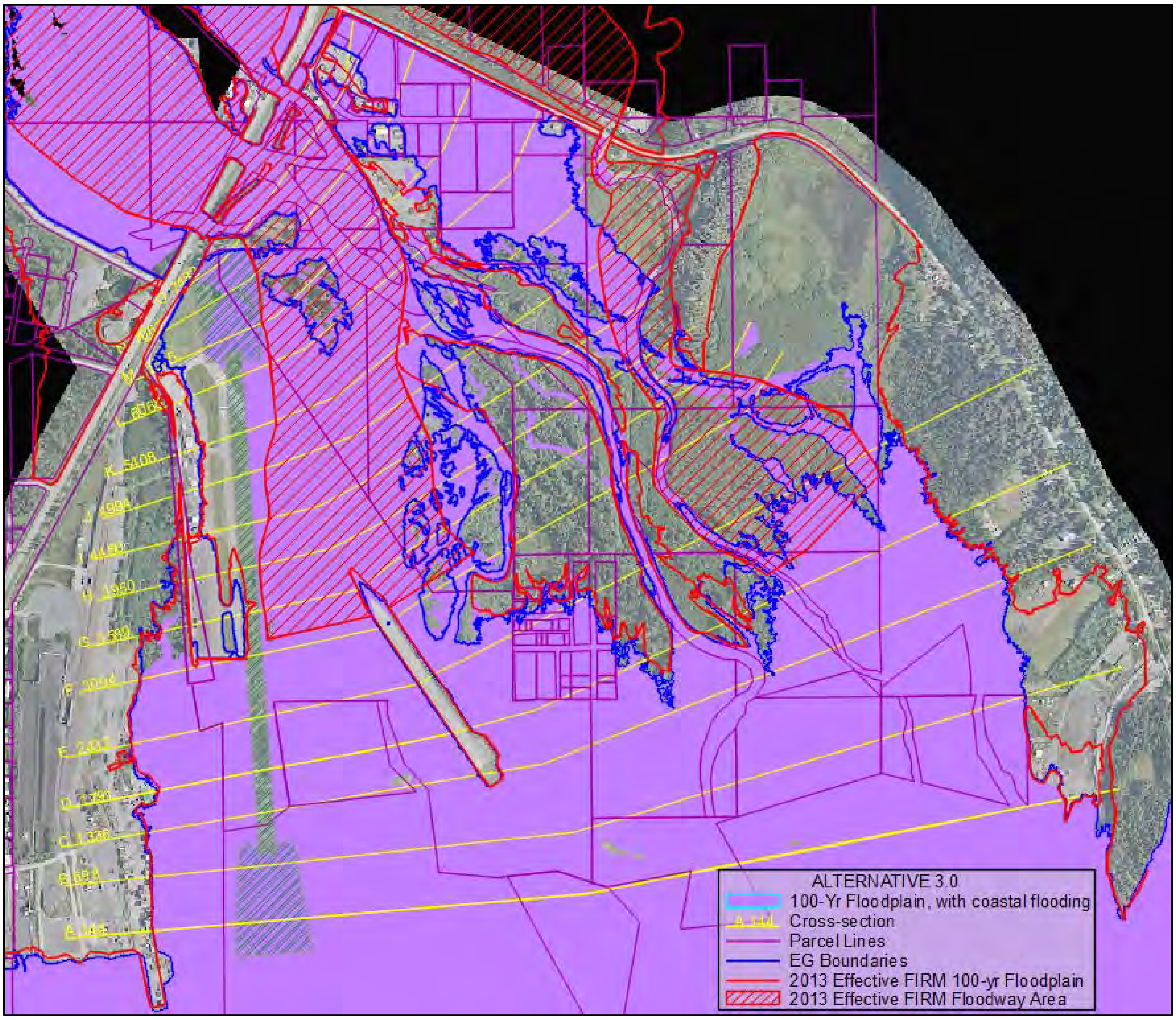

Figure 17. 100-year flood map for Alternative 3.0.

Alt 3.0-This design alternative reconstructs and lengthens Runway 16/34 and raises the elevation with a 2-ft freeboard above the 100-year flood. Runway 13/31 is abandoned for active aircraft use; it will be allowed to overtop and erode.

Water surface elevation increases of less than 1 foot occur from Cross-section F to Cross-section M. The maximum water surface elevation increase is 0.79 feet, and occurs at Cross-section F. The private parcels in the middle of the Resurrection River floodplain are partially inundated. At some areas of the 100-year floodplain between the Seward Highway and Resurrection Bay, the eastern limit has slightly expanded. At Cross-section F, the Alt 2.2 floodplain boundary is 160 feet east of the EG model boundary (dark blue line); a low spot in Cross-section G 200 feet east of the EG boundary is inundated. These locations are within the Salmon Creek Effective FIRM floodplain Zone AH; however, the Alt 2.2 water surface elevations of Cross-sections F and G are lower than the FIRM base flood elevations there. At Cross-section K, the Alt 1.1 floodplain boundary is approximately 400 feet northeast of the EG model boundary, but still within the Salmon Creek Effective FIRM base flood and floodway boundary.

Bed Scour Estimates for Embankment Toe Protection

Total scour is the sum of all scour components that are applicable for a given location. At a location where long-term aggradation occurs, conservative practice dictates that it is ignored in the total scour calculations. In addition, bed form scour is generally only considered in sand-bed channels. As the Resurrection River does not have a sand bed, scour calculations included general and bend scour components.

Because of the river/runway interface, erosion protection is required for the runway embankments. For initial planning purposes, scour was analyzed at several cross-sections for Alt 1.1, Alt 2.2, and Alt 3.0. Five methods were used for each analysis. Table 7 lists the Alternative and Cross-section analyzed, and the maximum, minimum, and average scour depth.

Table 7. Preliminary scour analysis.

Alternative & Cross-section	Total Scour (feet)		
	Maximum	Minimum	Average
Alt 1.1 Xsec 3950	11.2	3.0	5.1
Alt 1.1 Xsec 3094	8.4	2.1	4.7
Alt 2.2 Xsec 3950	12.6	2.8	5.7
Alt 2.2 Xsec 3094	11.5	1.9	5.8
Alt 3.0 Xsec 3950	12.2	2.4	5.1
Alt 3.0 Xsec 3094	11.9	2.9	5.3
Alt 3.0 Xsec 1791	11.6	2.8	5.8

The average scour depth for Runway 13/31 is 5.3 ft; Runway 16/34 is 5.4 ft. Total scour depth is subtracted from the lowest elevation in the stream bed (thalweg) to obtain the scour elevation. Additional analysis will be conducted following the selection of the preferred design alternative.

Riprap

For planning purposes, a preliminary riprap analysis was conducted at several cross-sections for Alt 1.1, Alt 2.2, and Alt 3.0. Three methods were used for each analysis. See Table 8.

Table 8. Preliminary riprap analysis.

	Percent lighter by Weight	Rock Min/Max (lbs)	Layer Thickness (ft)	ADOT&PF Class
USACE Method	W100	191/477	1.750	Class II+
	W50	95/141		
	W15	30/71		
California Bank and Shore Protection	**Percent larger Than**	**Rock Size (ton)**	**Layer Thickness (ft)**	**ADOT&PF Class**
	0-5	1.00	3.40	Class IV-
	50-100	0.50		
	95-100	0.25		
HEC-11 FHWA	**Percent Smaller by Size**	**Rock Size (feet)/ Rock Weight (lbs)**	**Layer Thickness (ft)**	**ADOT&PF Class**
	D100	1.30/200	1.90	Class II
	D50	0.95/75		
	D10	0.40/5.0		

Note that the USACE method calls for a Class II +, Cal B&SP calls for Class IV-, and HEC-11 calls for Class II. Given the angle of attack of the flow to the runway embankment, Class III is recommended for embankment protection for the southern half of the Runway, including and extending upstream beyond the anticipated point of impinging flow. Above the point of impinging flow, Class II riprap is recommended. Additional analysis will be conducted following the selection of the preferred design alternative.

Due to the length of Runway 16/34 in Alternative 2.2, the embankment will extend into the Resurrection Bay intertidal zone. Additional erosion protection will be required to protect the runway embankment from wave runup and storm surge events.

Recommendations

Though FAA Advisory Circulars, the Alaska Aviation Preconstruction Manual, and the Alaska Highway Preconstruction Manual (AHPCM) do not provide a design return interval specifically applicable for an airport adjacent a river, Table 1120-1 in the AHPCM recommends using a discharge with a 100-year return interval to design culverts and channel changes in designated flood hazard areas with no reference to the type of facility. ADOT&PF interprets this recommendation to be applicable for countermeasures pertaining to both flooding and scour at airport facilities in FEMA mapped floodways and floodplains (Janke, 2015).

The braided channel of the Resurrection River adjacent to the Seward Airport has exhibited significant changes in location over time. Additionally, the frequency of runway overtopping events and the required maintenance has been increasing with time. Because of the dynamic nature of the Resurrection River at close proximity to the Seward Airport, the design guidelines should be conservative.

Panels 4543, 4544, 5006, and 5007 of the 2013 Flood Insurance Rate Map (FIRM) are found in Appendix H. Panel 4543 includes the Seward Airport and the Resurrection River Regulatory Floodway. FEMA regulations state communities shall prohibit encroachments, fill, new development, substantial improvements, and other development within the adopted regulatory floodway unless it has been demonstrated through hydrologic and hydraulic analyses that the proposed encroachment would not result in any increase in flood levels within the community of the base flood (100-year) discharge. In addition, the KPB Floodplain Development Ordinance (KPB, 1986) also prohibits any increase in flood levels during the base flood that result from fill, construction and other development within the regulatory floodway.

Also note that minimum federal standards limit the maximum allowable rise of the 100-year Base Flood Elevation (BFE) to 1 foot. FEMA's regulations allow for State and local government regulations that are more stringent (allow something less than a one foot rise) to take precedence.

Alternative 1.1 requires encroachment within the Regulatory Floodway due to construction of the raised runway. The hydraulic analysis shows a range of flood level increases within the regulatory floodway during the base flood. Additionally, BFE increases of more than 1 foot would occur in areas of the 1% chance floodplain other than the regulatory floodway. In addition to the large BFE increases, the impacts from the encroachment required by Alternative 1.1

include backing up floodwaters onto private properties in the middle of the Resurrection River floodplain. The eastern limit would expand as well toward Nash Road, potentially impacting private properties. Additionally, floodwater velocities generally increase, which could lead to erosion and embankment toe scour. Finally, the large BFE increases would result in a substantial quantity of material being needed to raise the runway embankment to the design crest elevation.

If selected as the engineering preferred alternative, this design would likely face substantial permitting obstacles and requires modification to the effective FIRM and Floodway Map. Such an action would require a Letter of Map Revision (LOMR), which is FEMA’s modification to an effective FIRM, or Flood Boundary and Floodway Map, or both. LOMR reviews take up to 90 days to process, are subject to an appeal period, and usually become effective within six months after they are issued (FEMA, 2015a). The preparation of a LOMR request includes extensive hydrologic computations, hydraulic analysis, and regulatory requirements.

Alternatives 2.2 and 3.0 do not require encroachment within the Regulatory Floodway, and will result in BFE increases of less than 1 foot. Impacts to private properties from the BFE increases are much smaller than with Alternative 1.1. When including the effects from coastal flooding, there would be only small impacts (increased inundation) to the private properties in the middle of the Resurrection River floodplain. Similarly, there would be a very small expansion of the eastern limit of the 100-year floodplain toward private properties along Nash Road between the Seward Highway and Resurrection Bay. The expansions would still be contained within the Salmon Creek Effective FIRM floodplain. Average velocity increases would be less than 15 percent, though larger local increases may occur near new embankments.

However, either of these alternatives may still require a Conditional Letter of Map Revision (CLOMR). A CLOMR is FEMA's comment on a proposed project that would, upon construction, result in the modification of the existing regulatory floodway, the effective BFEs, or the Special Flood Hazard Area (FEMA, 2015b). A CLOMR is required when proposed changes will cause any increase the BFE where a regulatory floodway has been identified. Consultation with FEMA, the City of Seward, and the KPB Floodplain Administrator is suggested to determine if a CLOMR is required for either Alternative 2.2 or 3.0.

The following recommendations are based on the hydraulic analysis described in this report, as well as applicable local and FEMA floodway and floodplain regulations:

1. The engineering preferred design should be either Alternative 2.2 or 3.0.

2. In the future, long-term stockpiling of overburden and gravel in the channel or floodplain of the Resurrection River downstream of the Seward Highway bridges should be discouraged.

3. The recommended design water surface elevation for the Seward Airport Improvements project is the water surface elevation during the discharge with a 100-year (1% chance) return interval plus a two-foot freeboard.

4. The recommended design condition for erosion protection for the Seward Airport Improvements project is the discharge with a 100-year (1% chance) return interval.

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Appendix A – Flood History at Seward Airport

1951 - Runway 15-33 was constructed with gravel in the late 1920s. During 1951 construction for Runway 12-30, dozers uncovered subsurface springs, which flooded the new surface and delayed construction equipment and led to the installation of subsurface drains. Additional delays resulted from extraordinarily heavy rainfall and seasonal high tides that interfered with the normal drainage of the airport area. (Barber, 2006; ADOT&PF, 2008)

1961 - 500 ft of south end of the runway embankment was severely damaged by erosion. (Barber, 2006).

1962 - Resurrection River Heavy flood flows spread out over east side of floodplain; severe bank erosion above and below highway; washed out Airport Road bridge (FEMA, 2014).

1964 - Following the Good Friday Earthquake, much of Seward was inundated by tsunamis in Resurrection Bay. Light airport damage, but small planes were wrecked by waves (USGS, 1967).

1966 - North portion of both runways under water (Barber, 2006).

1974 - North portion of both runways under water (Barber, 2006).

1986 - In October, Typhoon Carmen delivered 18" of rain in a 3-day period in Seward (SBCFSA, 2010). North portion of both runways under water. Approximately 200 feet of the south end of the airport's runway was damaged by floodwaters. Center taxiway between both runways was washed out in two locations (Barber, 2006).

1995 - In September, Typhoon Oscar delivered 9" of rain in 24 hours in Seward (SBCFSA, 2010). North portion of both runways was under approximately 1.5 to 2.5 feet of water. Extensive erosion of the south end of the airport runway. Center taxiway between both runways was washed out. Riprap was replaced at the end of the runway during the actual flood event (Barber, 2006). The 1995 flood shifted 90 percent of the Resurrection River's flow into a channel adjacent to Runway 12-30 (ADOT&PF, 2008).

2003 - A combination of high water from the Resurrection River and surge high tides reached the edge of the runway pavement on the south end of the runway. The north end of the runway was not flooded. No damage was reported. According to NOAA, this was a wind driven high tide event. The elevations observed did not include wave run-up (Barber, 2006).

2006 (Oct)-Typhoon Xangsane delivered 9"- 15" of rain in a 48-hour period in Seward. Airport was flooded (SBCFSA, 2010).

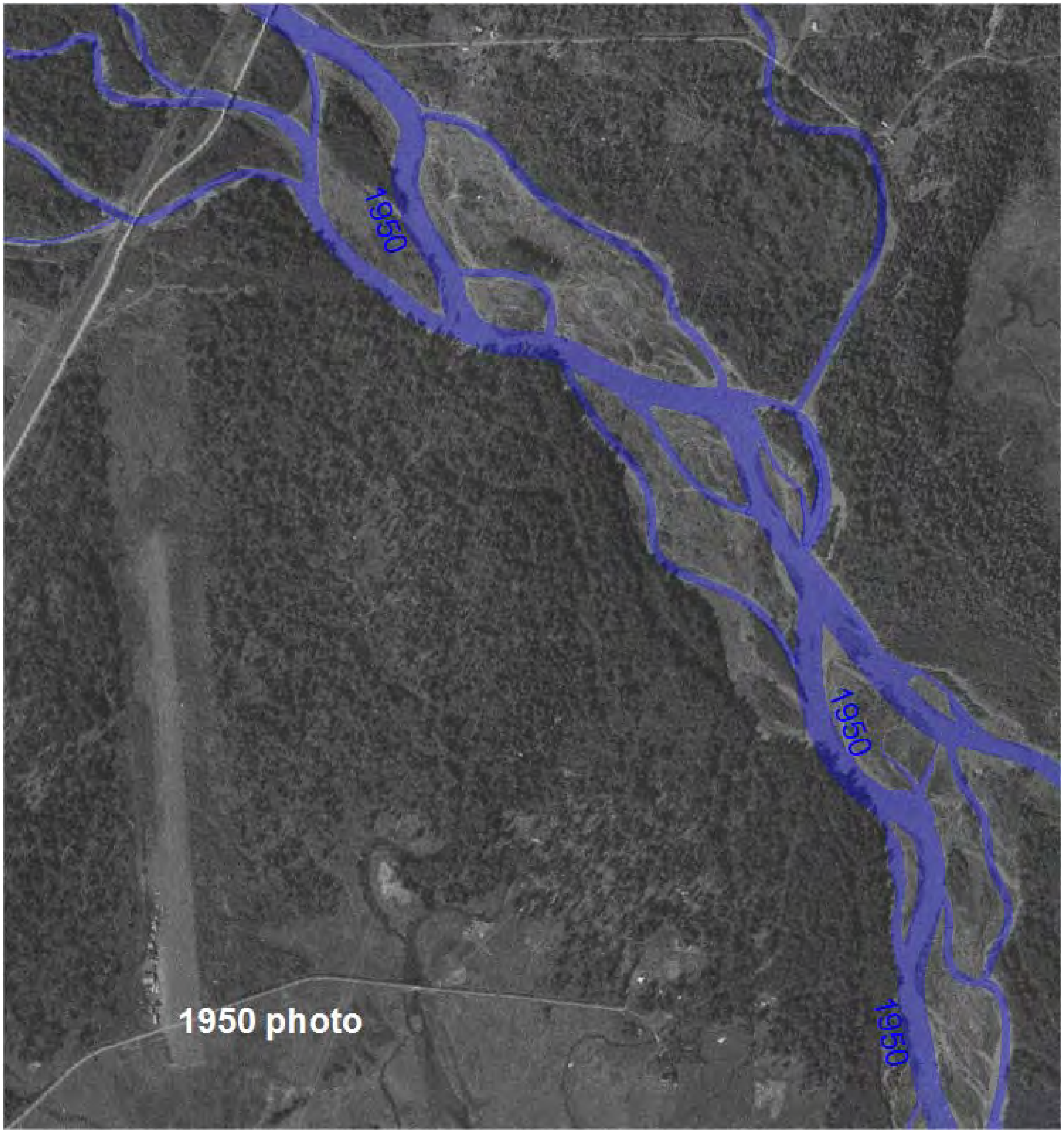
2009 (July)-Heavy rains and high tides resulted in water over the runway and taxiway (SBCFSA, 2010).

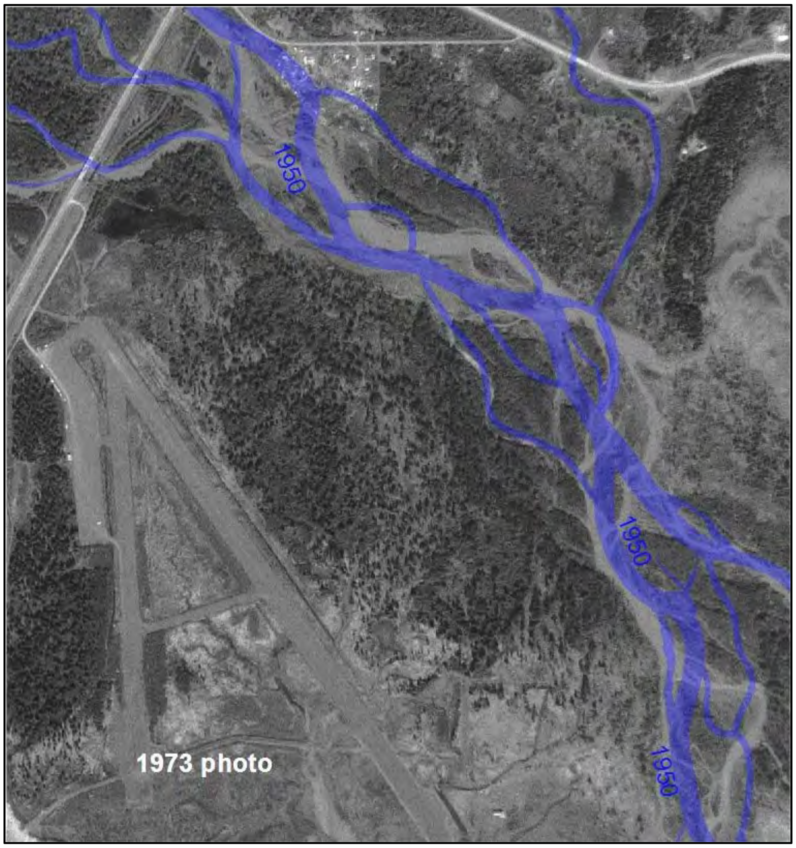
2012 (Sept) - Runway 13-31 is flooded and closed due to heavy rains (KTUU).

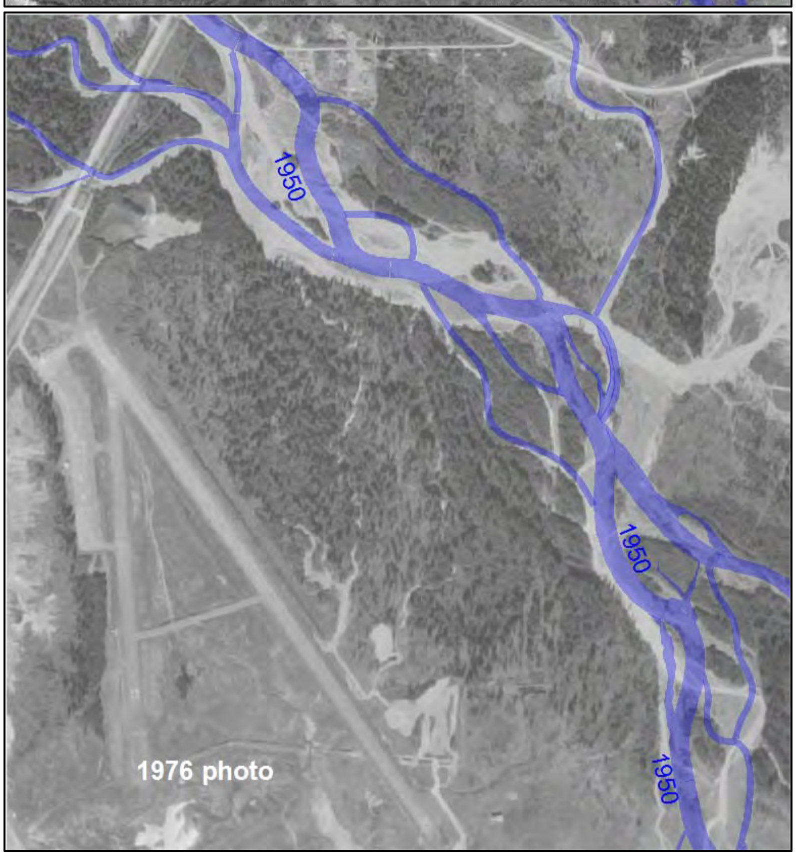
2013 - Runway 13-31 is flooded multiple times during summer and fall. Flooding in June was the result of rapid glacier melting due to record high temperatures (Seward Phoenix Log). Airport is reopened in October following construction of emergency erosion control along the runway.

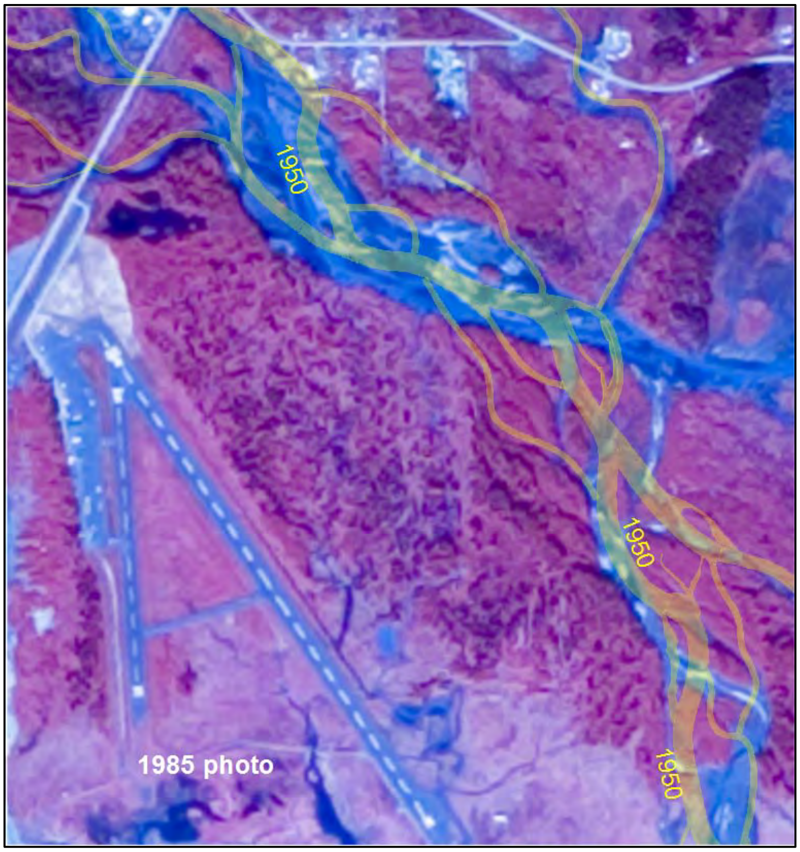
2014 - Runway 13-31 is flooded in September (Seward City News).

Appendix B – Aerial Imagery, 1950 to 2014




1950
1950
1950
1973 photo


1950
1950
1950
1976 photo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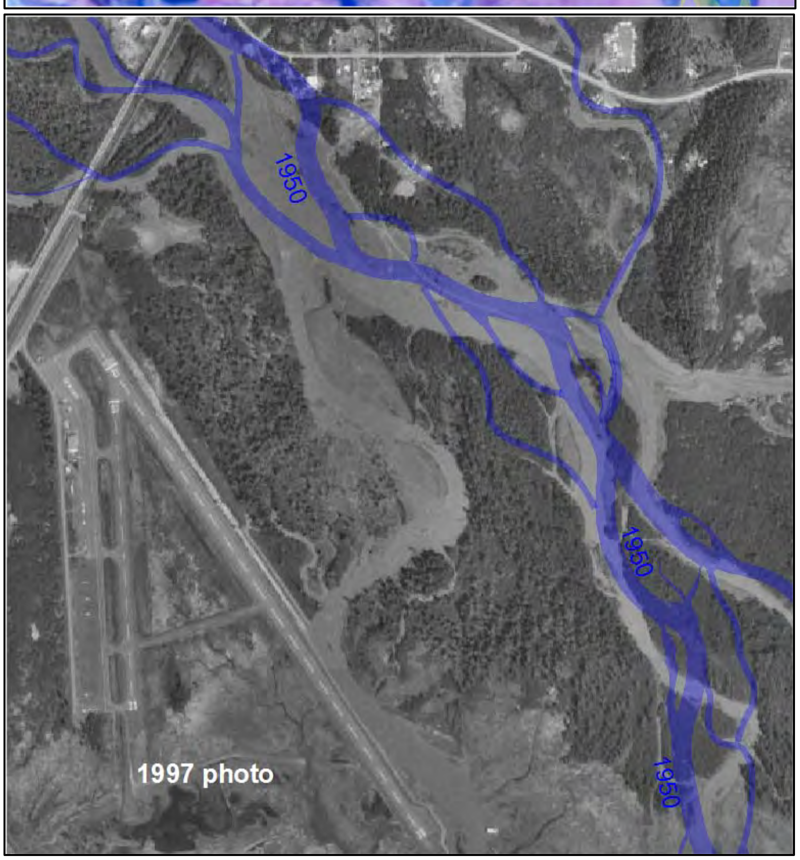
1950
1950
1985 photo


1950
1950
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1997 photo


1950
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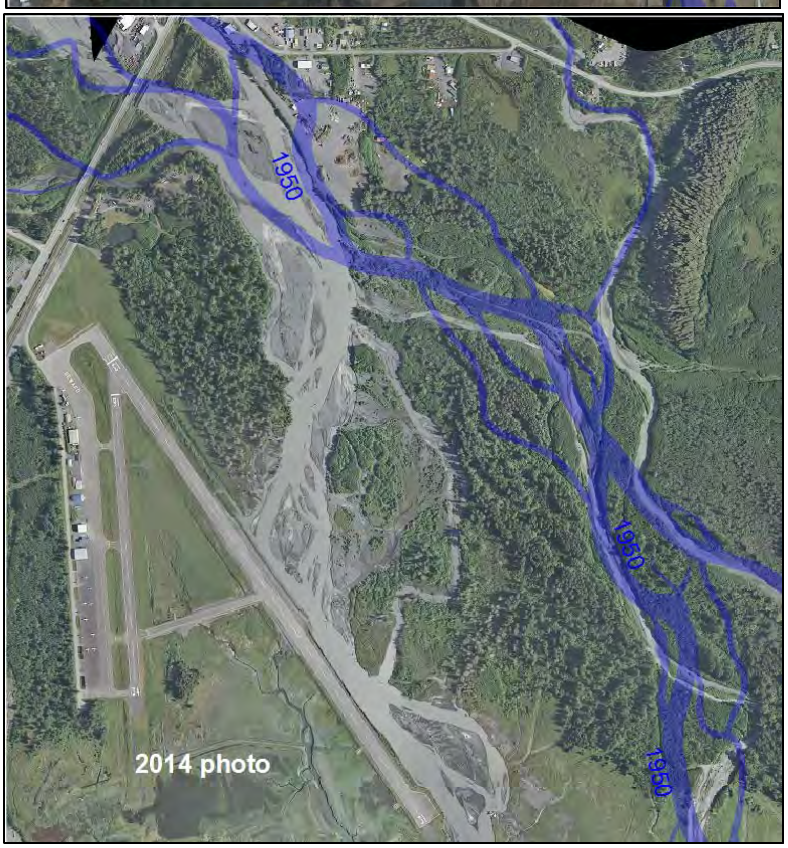
1950
2011 photo


1950
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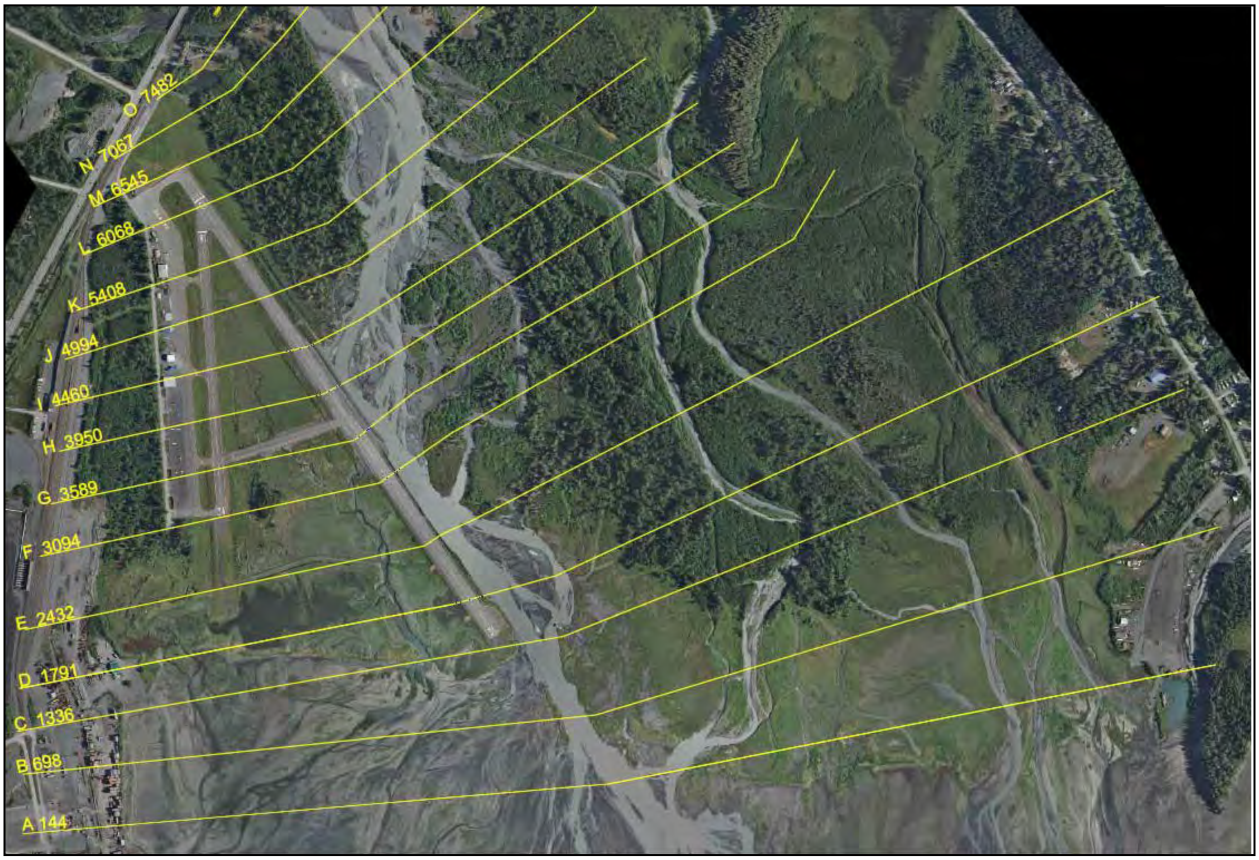
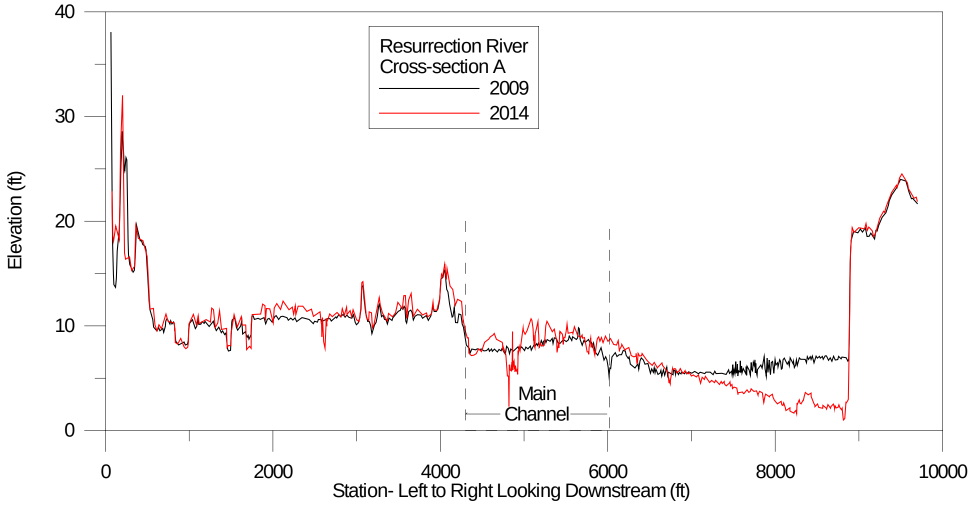
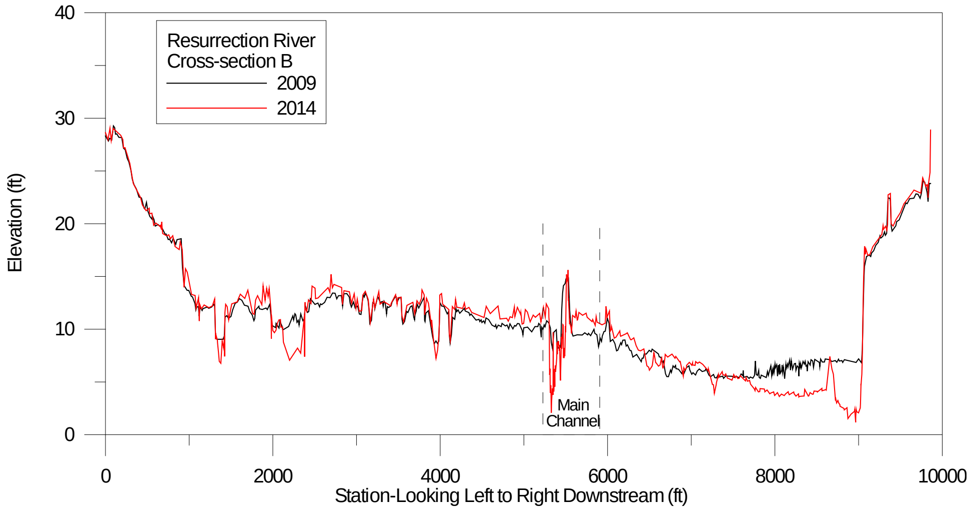
Appendix C-HEC-RAS Cross-section Locations

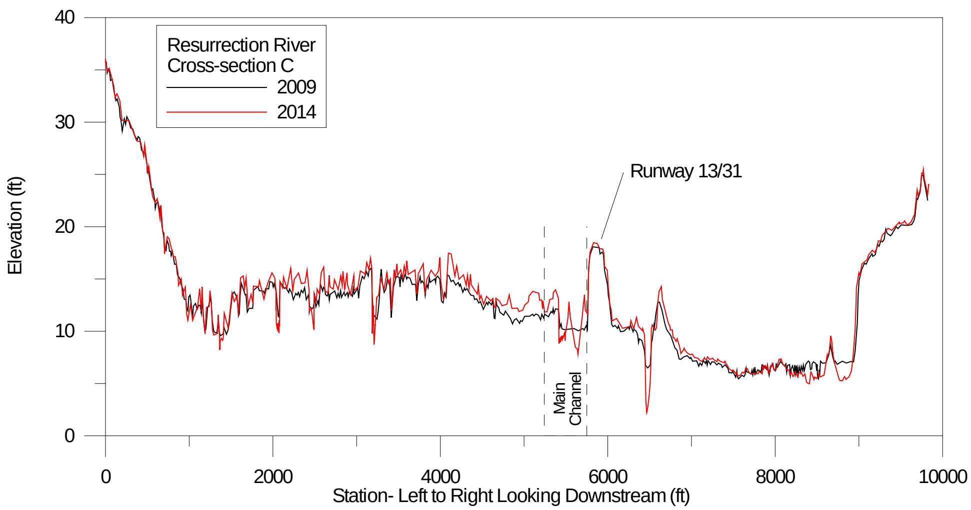


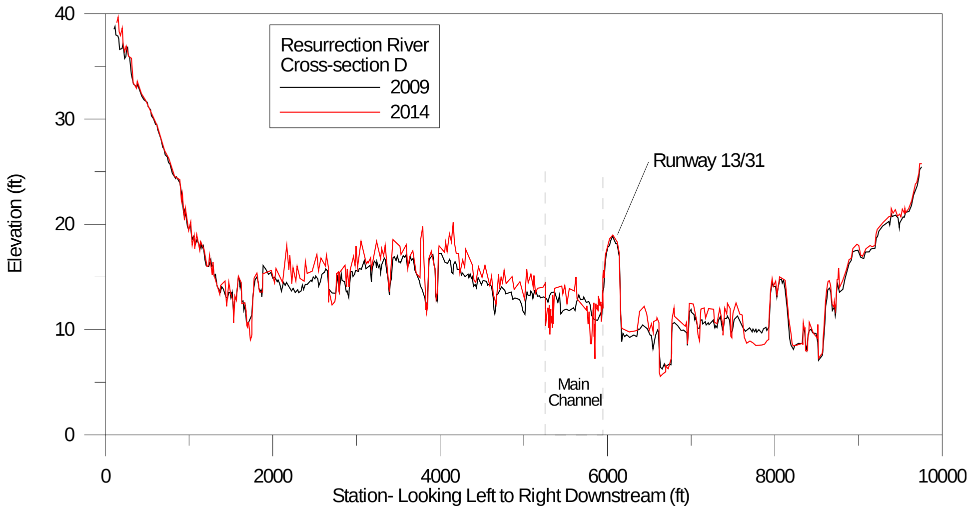
Appendix D-Cross-sections A-0 for 2009 and 2014.

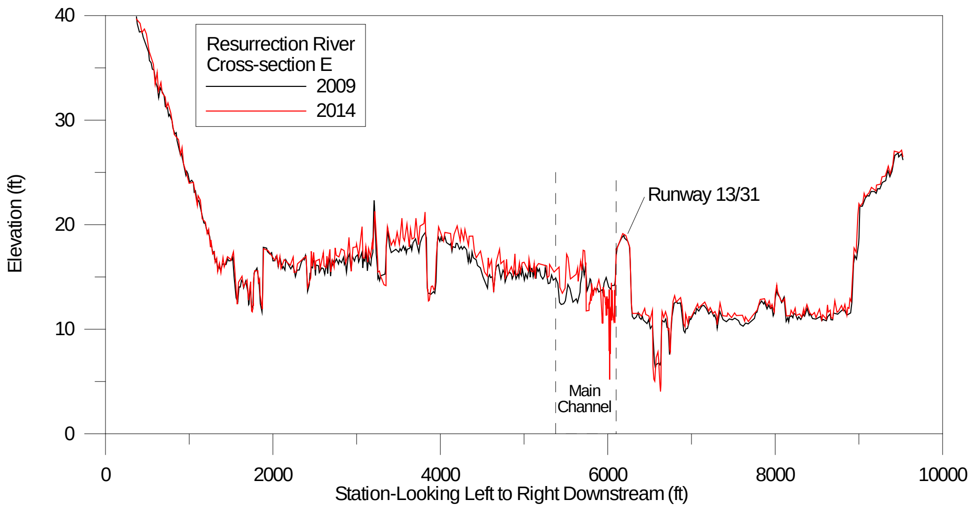
Note: main channel elevations should not be compared between years, as the 2009 sections are LiDAR-derived, with no in-channel bottom survey.

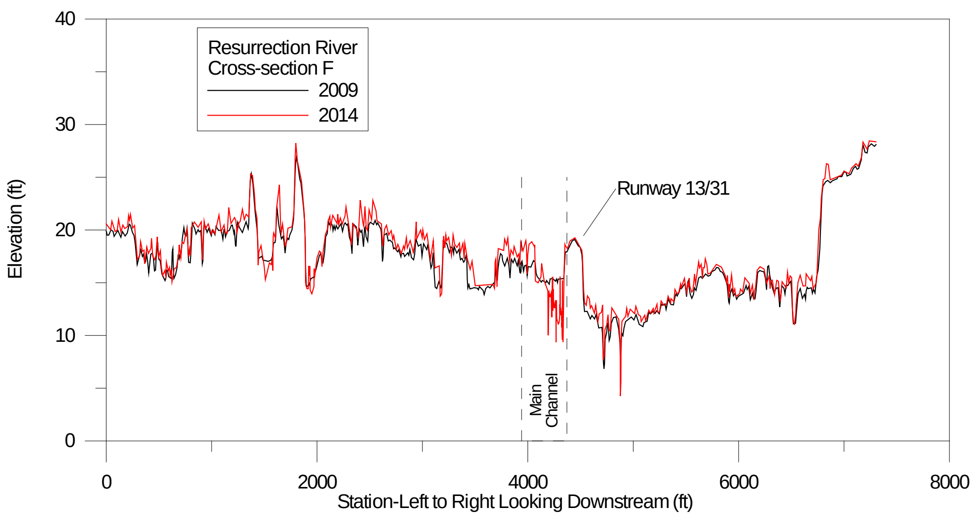


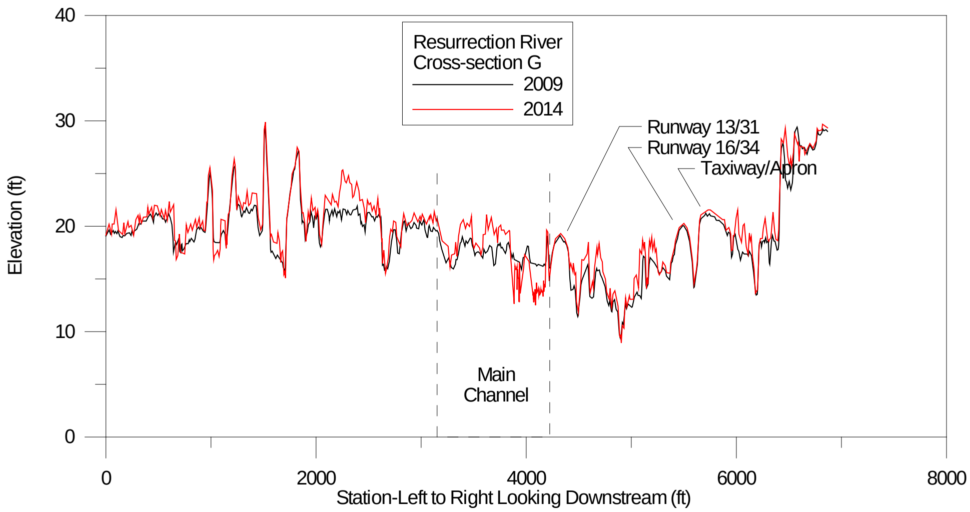


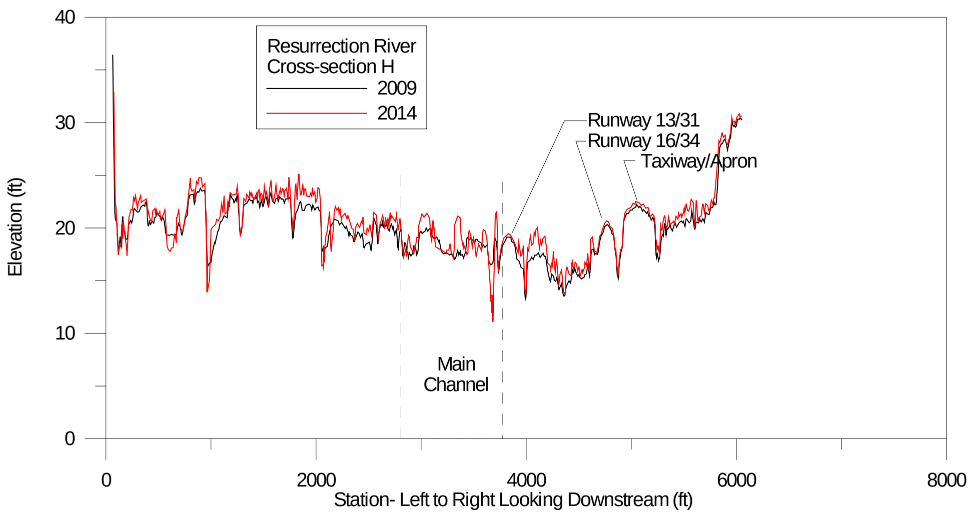


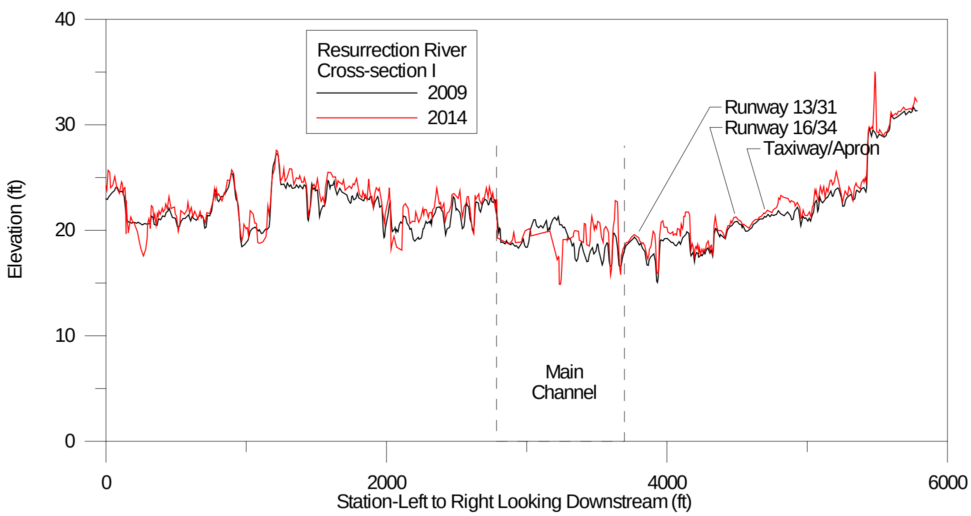

Resurrection River
Cross-section D
2009
2014
Runway 13/31
Main
Channel
Elevation (ft)
Station- Looking Left to Right Downstream (ft)
0
10
20
30
40
0
2000
4000
6000
8000
10000

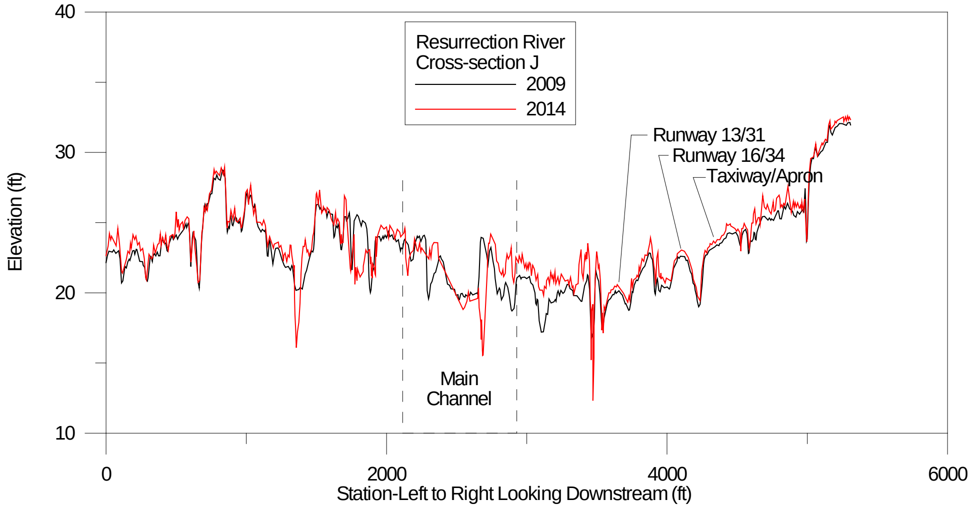

Resurrection River
Cross-section E
2009
2014
Runway 13/31
Main
Channel
Elevation (ft)
Station-Looking Left to Right Downstream (ft)
0
10
20
30
40
0
2000
4000
6000
8000
10000


Resurrection River
Cross-section F
2009
2014
Runway 13/31
Main
Channel
Elevation (ft)
Station-Left to Right Looking Downstream (ft)
0
10
20
30
40
0
2000
4000
6000
8000

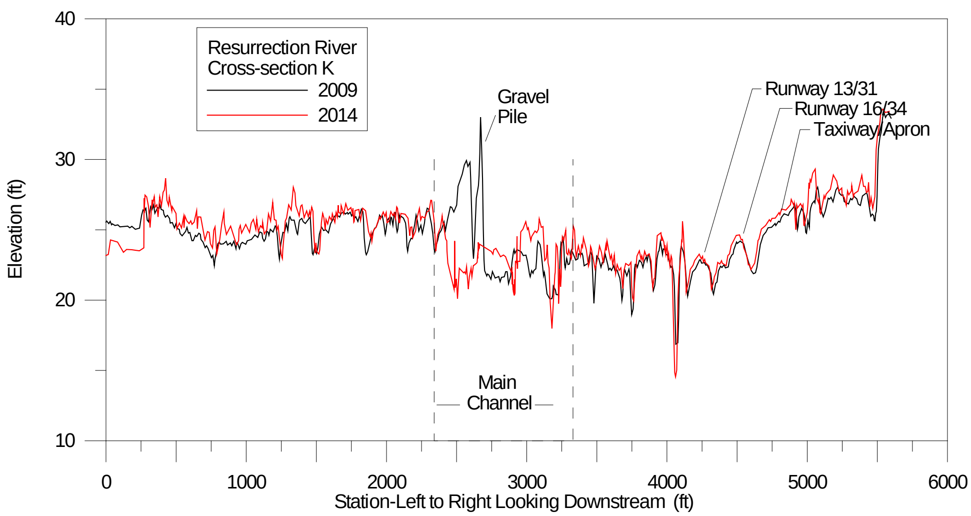

Resurrection River
Cross-section G
2009
2014
Runway 13/31
Runway 16/34
Taxiway/Apron
Main Channel
Elevation (ft)
Station-Left to Right Looking Downstream (ft)
0
10
20
30
40
0
2000
4000
6000
8000


Resurrection River
Cross-section H
2009
2014
Runway 13/31
Runway 16/34
Taxiway/Apron
Main Channel
Elevation (ft)
Station- Left to Right Looking Downstream (ft)
0
10
20
30
40
0
2000
4000
6000
8000

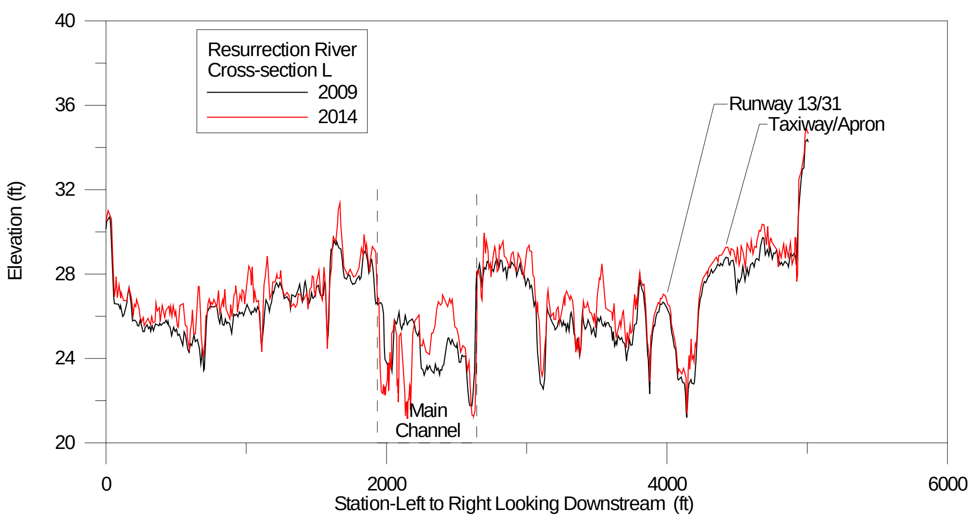

Resurrection River
Cross-section I
2009
2014
Runway 13/31
Runway 16/34
Taxiway/Apron
Main Channel
Elevation (ft)
Station-Left to Right Looking Downstream (ft)
0
10
20
30
40
0
2000
4000
6000



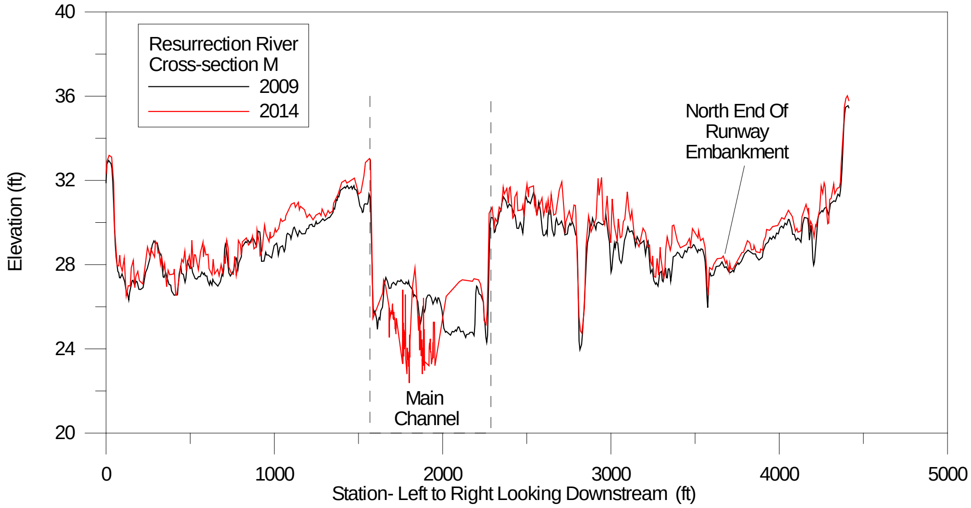
Resurrection River
Cross-section J
2009
2014
Runway 13/31
Runway 16/34
Taxiway/Apron
Main
Channel
Elevation (ft)
40
30
20
10
0
2000
4000
6000
Station-Left to Right Looking Downstream (ft)

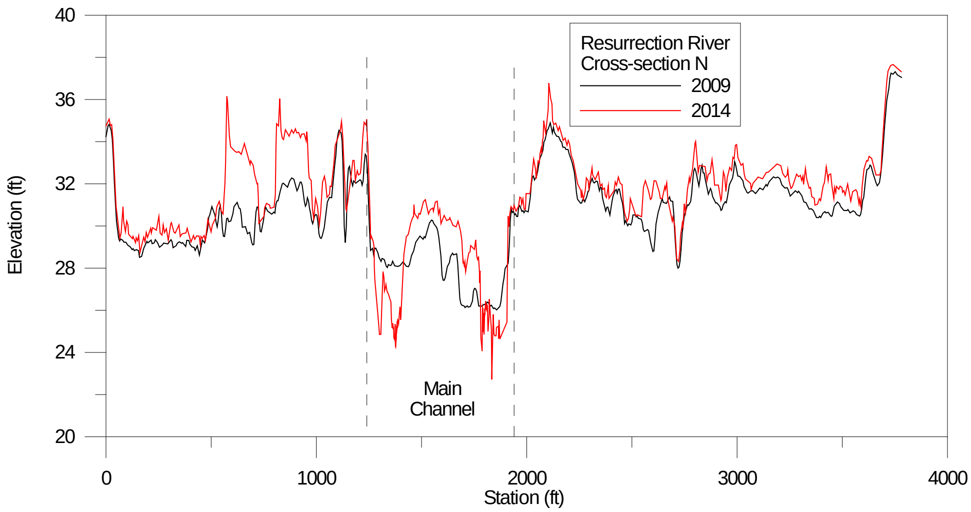


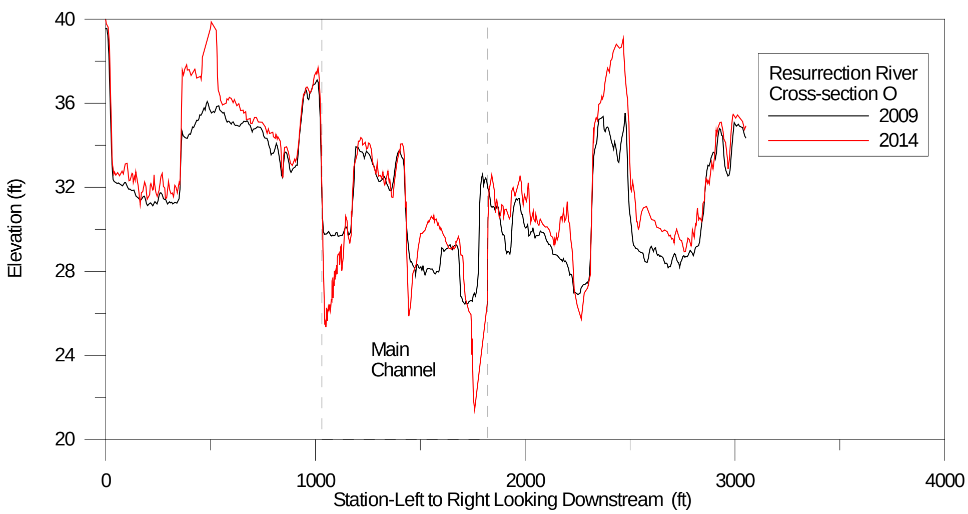
Resurrection River
Cross-section K
2009
2014
Gravel
Pile
Runway 13/31
Runway 16/34
Taxiway/Apron
Main
Channel
Elevation (ft)
40
30
20
10
0
1000
2000
3000
4000
5000
6000
Station-Left to Right Looking Downstream (ft)



Resurrection River
Cross-section L
2009
2014
Runway 13/31
Taxiway/Apron
Main
Channel
Elevation (ft)
40
36
32
28
24
20
0
2000
4000
6000
Station-Left to Right Looking Downstream (ft)


Resurrection River
Cross-section M
2009
2014
North End Of
Runway
Embankment
Main
Channel
Elevation (ft)
40
36
32
28
24
20
0
1000
2000
3000
4000
5000
Station- Left to Right Looking Downstream (ft)


Resurrection River
Cross-section N
2009
2014
Main
Channel
Elevation (ft)
40
36
32
28
24
20
0
1000
2000
3000
4000
Station (ft)


Resurrection River
Cross-section O
2009
2014
Main
Channel
Elevation (ft)
40
36
32
28
24
20
0
1000
2000
3000
4000
Station-Left to Right Looking Downstream (ft)

Appendix E-Seward Precipitation Record

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1964	3.14	9.32	0.98	2.13	2.14	2.04	1.77	8.26	8.98	10.33	9	2.14	57.09
1965	3.5	1.64	7.41	1.86	6.15	8.83	2.02	1.75	9.86	5.26	4.58	3.08	55.94
1966	1.96	2.92	4.15	1.33	3.36	0.62	2.77	14.14	17.89	11.5	2.07	3.99	66.7
1967	2.41	3.41	2.18	1.13	0.84	3.1	3.12	8.26	26.08	5.29	12.59	3.96	72.37
1968	0.87	5.53	2.88	1.31	2.89	0.74	0.74	1.5	7	5.07	5.44	2.45	36.42
1969	0.67	4.79	2.12	3.76	3.91	3.76	1.58	2.95	5.22	21.97	6.25	17.6	74.58
1970	1	8.58	6.78	7.85	0.43	2.83	3	4.88	4.63	9.11	3.87	4.7	57.66
1971	2.29	11.62	4.17	6.52	10.37	3.66	3.84	3.72	3.38	9.75	3.87	4.58	67.77
1972	1.28	2.73	2.32	0.95	6.64	2.72	0.6	5.21	10.99	8.29	4.79	0.96	47.48
1973	3.56	5.05	3.76	8.37	8.84	1.36	1.76	2.68	6.78	4.3	2.35	8.06	56.87
1974	1.23	4.17	1.79	4.58	0.42	1.47	0.89	2.37	12.73	11.03	13.09	4.27	58.04
1975	5.18	7.61	1.55	4.25	5.85	1.63	0.8	1.83	11.75	8.4	0.21	7.5	54.73
1976	5.16	1.94	3.37	8.34	2.59	1.23	0.59	3.18	19.18	10.59	25.22	10.47	91.86
1977	15.55	13.28	1.82	9.74	6.95	2.22	2.29	7.46	6.4	8.76	0.41	1.06	75.94
1978	8.59	9.56	3.36	3.16	2.91	1.8	3.15	2.2	5.41	17.98	5.4	4.22	67.74
1979	3.53	0.07	5.26	1.15	2.77	1.95	-----	10.63	19.1	17.94	16.34	4.23	82.97
1980	6.36	13.31	3.59	5.56	6.39	2.89	3.25	3.61	7.32	19.6	8.57	2.5	82.95
1981	25.43	7.26	12.29	0.28	5.5	1.61	1.75	11.75	9.19	6.74	7.24	7.33	96.37
1982	1.47	1.79	4.56	1.02	1.11	4.26	0.14	2.1	13.07	3.23	6.9	14.84	54.49
1983	5.29	5.49	1.57	5.94	3.9	1.86	2.18	5.2	5.94	11.84	14.67	2.26	66.14
1984	11.22	3.96	11.68	6.92	2.47	0.78	0.69	6.38	10.51	9.11	3.83	4.2	71.75
1985	12.68	1.38	4.55	0.57	9.29	2.08	1.99	3.43	4.32	2.09	0.54	19.67	62.59
1986	15.43	6.89	0.66	0.33	1.22	1.18	2.26	7.88	3.07	24	9.37	18.06	90.35
1987	14.63	6.55	4.21	4.54	4.73	5.76	0.97	0.93	10.48	20.7	4.01	6.4	83.91
1988	8.29	7.16	5.35	8.01	1.14	1.06	0.55	7.59	7.36	7.36	2.22	12.78	68.87
1989	3.59	0.49	0.14	6.48	3.51	4.02	4.45	11.72	13.01	14.2	4.42	10.73	76.76
1990	6.09	2.65	3.72	0.98	3.7	2.59	6.01	2.45	12.7	6.08	0.74	3.47	51.18
1991	-----	5.88	3.02	6.76	6.78	2.98	2.29	4.02	13.73	4.25	4.1	11.63	65.44
1992	8.96	4.32	7.64	1.15	0.56	1.12	2.72	7.36	2.1	6.12	14.64	4.08	60.77
1993	3.38	8.67	4.2	4.67	2.28	1.36	2.45	12.22	15.78	6.59	10.36	13.13	85.09
1994	11.02	3.44	4.49	6.67	8.34	1.53	2.45	2.09	10	9.71	5.65	9.44	66.9
1995	6.08	3.59	4.78	5.22	9.29	3.24	3.86	2.6	29.72	9.28	0.93	6.04	84.63
1996	0.2	10.05	0.89	3.07	1.03	2.64	1.6	3.36	4.05	2.72	1.61	2.11	33.33
1997	6.57	8.53	1.24	-----	2.19	1.8	-----	-----	18.78	3.01	-----	-----	42.12
1998	1.87	---	6.37	14.71	11.43	4.98	3.07	6.58	7.71	9.95	8.63	5.52	80.82
1999	6.73	3.59	6.39	4.6	2.05	1.23	1.3	4.31	9.51	6.56	4.94	13.87	65.08
2000	8.56	7.24	5.61	3.13	1.52	2.69	4.3	4.47	3.92	9.9	14.42	15.61	81.37
2001	22.33	7.76	6.92	5.57	2.38	0.63	5.03	6.44	7.78	6.4	2.72	13.2	87.16
2002	10.69	9.18	1.71	0.98	1.08	2.26	2.03	5.1	12.39	22.19	24.42	9.1	101.13
2003	5.43	14.91	2.32	2.93	4.45	2.49	2.02	10.43	7.35	8.43	3.73	12.8	77.29
2004	3.33	10.73	4.31	11.74	1.87	4.37	4.43	1.51	7.68	11.41	13.66	8.56	83.6
2005	5.82	5.24	4.93	6.55	2.74	1.34	2.38	2.75	6.98	5.57	2.1	9.5	55.9
2006	2.37	8.71	2.22	3.58	1.06	3.78	2.06	5.87	10.66	15.36	0.58	8.58	64.83
2007	9.13	2.6	0.5	5.79	1.88	2.88	1.56	3.38	6.9	7.16	22.55	7.13	71.46
2008	2.06	9.1	8.76	4.1	1.08	1.6	3.5	1.42	14.78	6.01	3.48	1.36	57.25
2009	9.7	1.04	1.19	1.99	1.25	1.67	9.95	3.78	3.58	7.84	7.52	5.68	55.19
2010	1.45	7.57	3.86	5.34	1.96	1.86	4.71	4.03	2.87	9.81	5.45	3.57	52.48
2011	4.97	3.87	0.77	4.31	2.14	1.39	1.32	8.53	10.87	12.82	2.91	8.58	62.48
2012	3.35	8.1	2.09	2.84	3.23	1.59	4.12	3.11	26.28	2.84	0.55	7.1	65.2
2013	8.88	5.66	6.14	0.69	5.74	1.02	6.28	10.72	11.2	18.63	2.85	0.95	78.76
2014	12.38	0.62	2.4	0.61	1.28	0.74	1.82	10.03	10.52	2.9	8.6	6.8	58.7
Mean	6.51	5.99	3.90	4.28	3.68	2.34	2.62	5.36	10.34	9.73	6.89	7.40	67.97

Appendix F- Summary HEC-RAS Results

HEC-RAS analysis results for Existing Ground (EG) and Alternatives 1.1, 2.2, and 3.0.

EG

XS	River Sta	Runway 13/31 Elev (ft)	Profile	Without Coastal Flooding Effects			With Coastal Flooding Effects	
				Vel Chnl (ft/s)	W.S. Elev (ft)	Freeboard (ft)	W.S. Elev (ft)	Freeboard (ft)
A	144	-	100-yr	3.49	12.63	-	16.20	-
			500-yr	3.77	13.15	-	16.20	-
B	698	-	100-yr	6.52	13.44	-	16.20	-
			500-yr	6.80	13.96	-	16.20	-
C	1336	18.47	100-yr	1.00	13.91	4.56	16.20	2.27
			500-yr	1.18	14.46	4.01	16.20	2.27
D	1791	18.99	100-yr	2.67	13.97	5.02	16.20	2.79
			500-yr	2.99	14.53	4.46	16.20	2.79
E	2432	19.15	100-yr	3.41	15.24	3.91	16.20	2.95
			500-yr	3.86	15.80	3.35	16.20	2.95
F	3094	19.26	100-yr	5.29	17.12	2.14	17.12	2.14
			500-yr	5.68	17.64	1.62	17.64	1.62
G	3589	19.31	100-yr	6.32	19.15	0.16	19.15	0.16
			500-yr	6.20	19.64	-0.33	19.64	-0.33
H	3950	19.47	100-yr	4.95	20.98	-1.51	20.98	-1.51
			500-yr	5.20	21.42	-1.95	21.42	-1.95
I	4460	19.59	100-yr	4.70	22.24	-2.65	22.24	-2.65
			500-yr	5.08	22.64	-3.05	22.64	-3.05
J	4994	20.58	100-yr	5.53	24.00	-3.42	24.00	-3.42
			500-yr	5.99	24.39	-3.81	24.39	-3.81
K	5408	23.27	100-yr	5.10	25.77	-2.5	25.77	-2.5
			500-yr	5.56	26.16	-2.89	26.16	-2.89
L	6068	27.05	100-yr	6.35	28.31	-1.26	28.31	-1.26
			500-yr	6.78	28.69	-1.64	28.69	-1.64
M	6545	-	100-yr	7.62	30.21	-	30.21	-
			500-yr	8.26	30.60	-	30.6	-
N	7067	-	100-yr	9.21	32.52	-	32.52	-
			500-yr	10.10	32.97	-	32.97	-
O	7482	-	100-yr	3.65	35.58	-	35.58	-
			500-yr	3.95	36.22	-	36.22	-

Alternative 1.1

XS	River Sta	Runway 13/31 Elev (ft)	Profile	Without Coastal Flooding Effects			With Coastal Flooding Effects		Q100 Elev Increase		
				Vel Chnl	W.S. Elev	Free-board	W.S. Elev	Free-board	EG Elev	Alt 1.1 Elev	Increase
				(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
A	144	-	100-yr	3.49	12.63	-	16.20	-	12.63	12.63	0.00
			500-yr	3.77	13.15	-	16.20	-	-	-	-
B	698	-	100-yr	6.52	13.44	-	16.20	-	13.44	13.44	0.00
			500-yr	6.80	13.96	-	16.20	-	-	-	-
C	1336	19.08	100-yr	9.43	15.47	3.61	16.20	2.88	13.91	15.47	1.56
			500-yr	10.03	15.95	3.13	16.20	2.88	-	-	-
D	1791	20.40	100-yr	5.53	17.58	2.82	17.58	2.82	13.97	17.58	3.61
			500-yr	6.03	18.12	2.28	18.12	2.28	-	-	-
E	2432	22.00	100-yr	6.68	19.10	2.90	19.10	2.90	15.24	19.10	3.86
			500-yr	7.17	19.70	2.30	19.70	2.30	-	-	-
F	3094	23.77	100-yr	3.26	21.16	2.61	21.16	2.61	17.12	21.16	4.04
			500-yr	3.49	21.78	1.99	21.78	1.99	-	-	-
G	3589	24.54	100-yr	4.70	22.02	2.52	22.02	2.52	19.15	22.02	2.87
			500-yr	5.07	22.61	1.93	22.61	1.93	-	-	-
H	3950	25.38	100-yr	5.06	22.74	2.64	22.74	2.64	20.98	22.74	1.76
			500-yr	5.39	23.33	2.05	23.33	2.05	-	-	-
I	4460	26.38	100-yr	5.64	23.63	2.75	23.63	2.75	22.24	23.63	1.39
			500-yr	6.11	24.19	2.19	24.19	2.19	-	-	-
J	4994	27.57	100-yr	6.18	25.02	2.55	25.02	2.55	24.00	25.02	1.02
			500-yr	6.64	25.57	2.00	25.57	2.00	-	-	-
K	5408	29.27	100-yr	5.37	26.56	2.71	26.56	2.71	25.77	26.56	0.79
			500-yr	5.70	27.06	2.21	27.06	2.21	-	-	-
L	6068	31.47	100-yr	6.70	28.71	2.76	28.71	2.76	28.31	28.71	0.40
			500-yr	7.22	29.13	2.34	29.13	2.34	-	-	-
M	6545	33.00	100-yr	7.18	30.51	2.49	30.51	2.49	30.21	30.51	0.30
			500-yr	7.80	30.97	2.03	30.97	2.03	-	-	-
N	7067	33.86	100-yr	9.28	32.49	1.37	32.49	1.37	32.52	32.49	-0.03
			500-yr	10.07	32.98	0.88	32.98	0.88	-	-	-
O	7482	-	100-yr	3.64	35.59	-	35.59	-	35.58	35.59	0.01
			500-yr	3.95	36.22	-	36.22	-	-	-	-

Alternative 2.2

XS	River Sta	Runway 16/34 Elev (ft)	Profile	Without Coastal Flooding Effects			With Coastal Flooding Effects		With Coastal Flooding Q100 Elev Increase		
				Vel Chnl	W.S. Elev	Free-board	W.S. Elev	Free-board	EG Elev	Alt 2.2 Elev	Increase
				(ft/s)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
A	144	-	100-yr	3.49	12.63	-	16.20	-	12.63	12.63	0.00
			500-yr	3.77	13.15	-	16.20	-	-	-	-
B	698	-	100-yr	6.52	13.44	-	16.20	-	13.44	13.44	0.00
			500-yr	6.80	13.96	-	16.20	-	-	-	-
C	1336	-	100-yr	1.00	13.91	-	16.20	-	13.91	13.91	0.00
			500-yr	1.18	14.46	-	16.20	-	-	-	-
D	1791	18.96	100-yr	3.96	13.90	5.06	16.20	2.76	13.97	13.90	-0.07
			500-yr	4.25	14.45	4.51	16.20	2.76	-	-	-
E	2432	19.70	100-yr	4.12	15.94	3.76	16.20	3.50	15.24	15.94	0.70
			500-yr	4.66	16.52	3.18	16.52	3.18	-	-	-
F	3094	20.66	100-yr	3.66	17.90	2.76	17.90	2.76	17.12	17.90	0.78
			500-yr	3.14	18.59	2.07	18.59	2.07	-	-	-
G	3589	22.10	100-yr	5.30	19.59	2.51	19.59	2.51	19.15	19.59	0.44
			500-yr	5.16	20.25	1.85	20.25	1.85	-	-	-
H	3950	23.68	100-yr	5.07	21.16	2.52	21.16	2.52	20.98	21.16	0.18
			500-yr	5.39	21.66	2.02	21.66	2.02	-	-	-
I	4460	25.12	100-yr	5.16	22.52	2.60	22.52	2.60	22.24	22.52	0.28
			500-yr	5.64	22.97	2.15	22.97	2.15	-	-	-
J	4994	26.86	100-yr	5.65	24.25	2.61	24.25	2.61	24.00	24.25	0.25
			500-yr	6.11	24.70	2.16	24.70	2.16	-	-	-
K	5408	28.71	100-yr	5.24	25.94	2.77	25.94	2.77	25.77	25.94	0.17
			500-yr	5.71	26.37	2.34	26.37	2.34	-	-	-
L	6068	31.19	100-yr	7.16	28.56	2.63	28.56	2.63	28.31	28.56	0.25
			500-yr	7.70	28.96	2.23	28.96	2.23	-	-	-
M	6545	-	100-yr	6.96	30.55	-	30.55	-	30.21	30.55	0.34
			500-yr	7.56	31.01	-	31.01	-	-	-	-
N	7067	-	100-yr	9.49	32.42	-	32.42	-	32.52	32.42	-0.10
			500-yr	10.34	32.89	-	32.89	-	-	-	-
O	7482	-	100-yr	3.62	35.62	-	35.62	-	35.58	35.62	0.04
			500-yr	3.92	36.26	-	36.26	-	-	-	-

Alternative 3.0

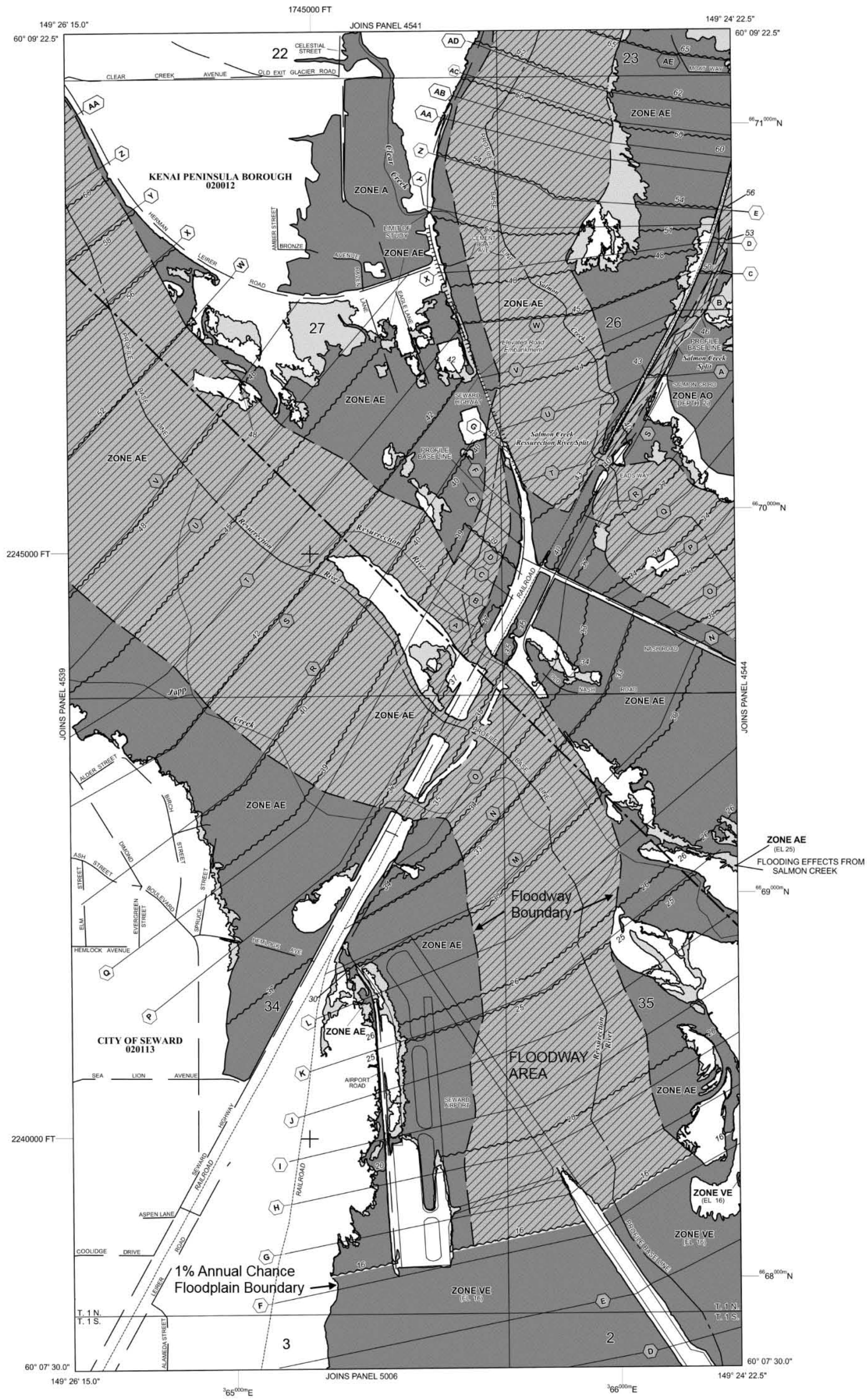
XS	River Sta	Runway 16/34 Elev (ft)	Profile	Without Coastal Flooding Effects			With Coastal Flooding Effects		With Coastal Flooding Q100 Elev Increase		
				Vel Chnl (ft/s)	W.S. Elev (ft)	Free-board (ft)	W.S. Elev (ft)	Free-board (ft)	EG Elev (ft)	Alt 3.0 Elev (ft)	Increase (ft)
A	144	-	100-yr	3.49	12.63	-	16.20	-	12.63	12.63	0.00
			500-yr	3.77	13.15	-	16.20	-	-	-	-
B	698	-	100-yr	6.52	13.44	-	16.20	-	13.44	13.44	0.00
			500-yr	6.80	13.96	-	16.20	-	-	-	-
C	1336	18.91	100-yr	1.59	14.16	4.75	16.20	2.71	13.91	14.16	0.25
			500-yr	1.86	14.71	4.20	16.20	2.71	-	-	-
D	1791	19.00	100-yr	3.44	14.45	4.55	16.20	2.80	13.97	14.45	0.48
			500-yr	3.96	15.03	3.97	16.20	2.80	-	-	-
E	2432	19.58	100-yr	4.09	15.99	3.59	16.20	3.38	15.24	15.99	0.75
			500-yr	4.61	16.59	2.99	16.59	2.99	-	-	-
F	3094	20.74	100-yr	3.65	17.91	2.83	17.91	2.83	17.12	17.91	0.79
			500-yr	3.13	18.60	2.14	18.60	2.14	-	-	-
G	3589	22.17	100-yr	5.28	19.58	2.59	19.58	2.59	19.15	19.58	0.43
			500-yr	5.12	20.23	1.94	20.23	1.94	-	-	-
H	3950	23.68	100-yr	4.90	21.11	2.57	21.11	2.57	20.98	21.11	0.13
			500-yr	5.21	21.60	2.08	21.60	2.08	-	-	-
I	4460	25.15	100-yr	5.09	22.45	2.70	22.45	2.70	22.24	22.45	0.21
			500-yr	5.59	22.89	2.26	22.89	2.26	-	-	-
J	4994	26.83	100-yr	5.72	24.21	2.62	24.21	2.62	24.00	24.21	0.21
			500-yr	6.18	24.67	2.16	24.67	2.16	-	-	-
K	5408	28.62	100-yr	5.38	25.97	2.65	25.97	2.65	25.77	25.97	0.20
			500-yr	5.86	26.41	2.21	26.41	2.21	-	-	-
L	6068	31.15	100-yr	7.03	28.60	2.55	28.60	2.55	28.31	28.60	0.29
			500-yr	7.56	29.01	2.14	29.01	2.14	-	-	-
M	6545	-	100-yr	7.00	30.54	-	30.54	-	30.21	30.54	0.33
			500-yr	7.59	30.99	-	30.99	-	-	-	-
N	7067	-	100-yr	9.47	32.43	-	32.43	-	32.52	32.43	-0.09
			500-yr	10.30	32.90	-	32.90	-	-	-	-
O	7482	-	100-yr	3.62	35.62	-	35.62	-	35.58	35.62	0.04
			500-yr	3.92	36.25	-	36.25	-	-	-	-

Appendix G – Scour Equations and Results

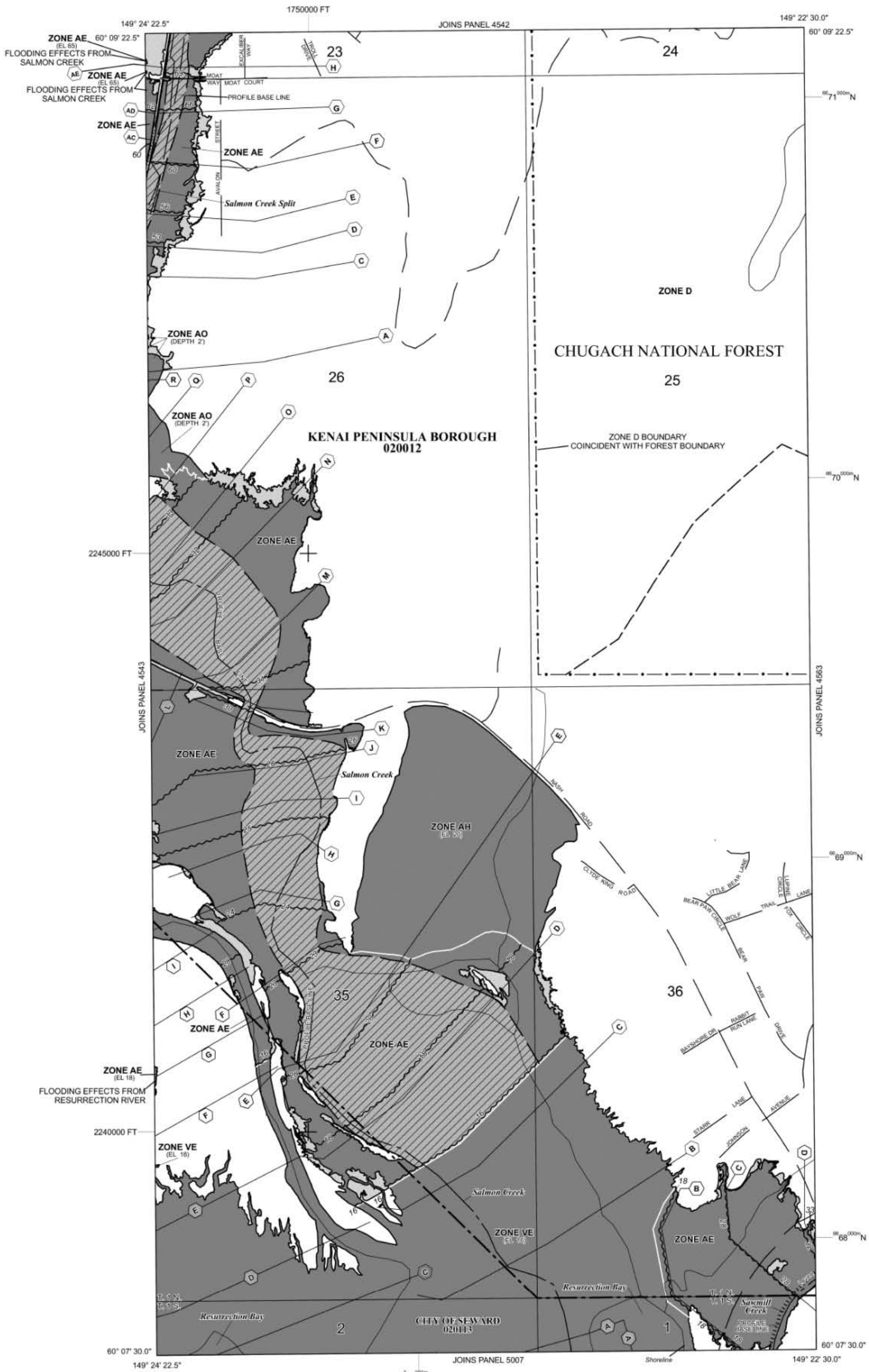
All results in units of feet.

Method	Alt 1.1 xsec 3950	Alt 1.1 xsec 3094	Alt 2.2 xsec 3950	Alt 2.2 xsec 3094	Alt 3 xsec 3950	Alt 3 xsec 3094	Alt 3 xsec 1791
Competent Velocity Corps Bend Total	-0.12 3.9 3.9	-1.66 4.05 4.05	0.27 4.26 4.53	0.47 6.74 7.21	0.21 3.04 3.25	-0.8 4.41 4.41	na
Competent Velocity Thorne Bend Total	-0.12 5.07 5.07	-1.66 5.07 5.07	0.27 5.07 5.34	0.47 5.07 5.54	0.21 4.63 4.84	-0.8 4.63 4.63	na
Neil	11.17	8.4	12.58	11.53	12.17	11.9	11.61
Lacey	2.67	3.81	2.84	1.92	2.35	2.92	2.91
Blench	2.7	2.1	3.0	2.78	2.92	2.86	2.79
Maximum	11.17	8.4	12.58	11.53	12.17	11.9	11.61
Minimum	3.0	2.1	2.84	1.92	2.35	2.86	2.79
Average	5.1	4.7	5.7	5.8	5.1	5.3	5.8

Appendix H-Flood Insurance Rate Maps for Seward Airport and Vicinity

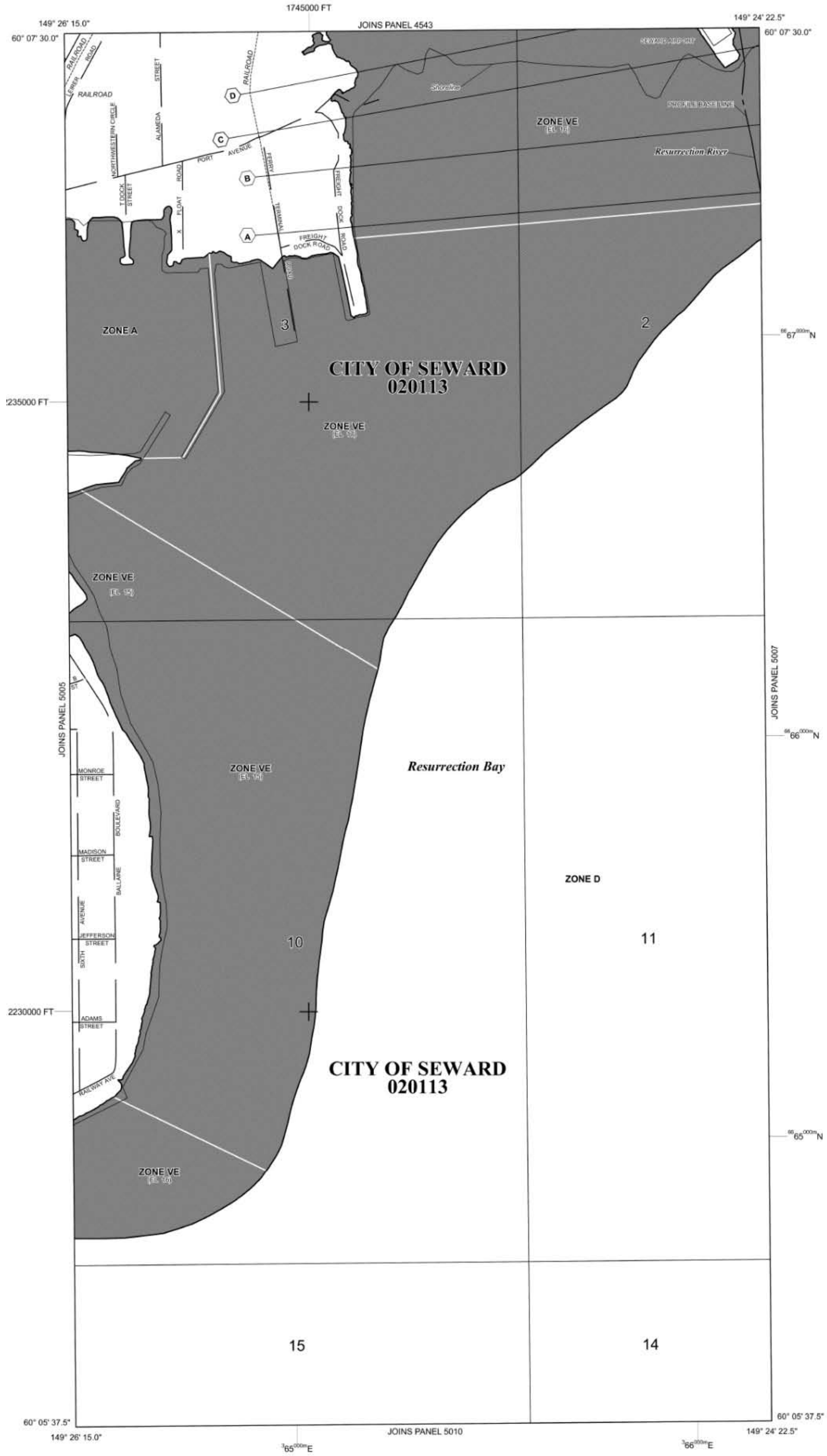


Panel 4543

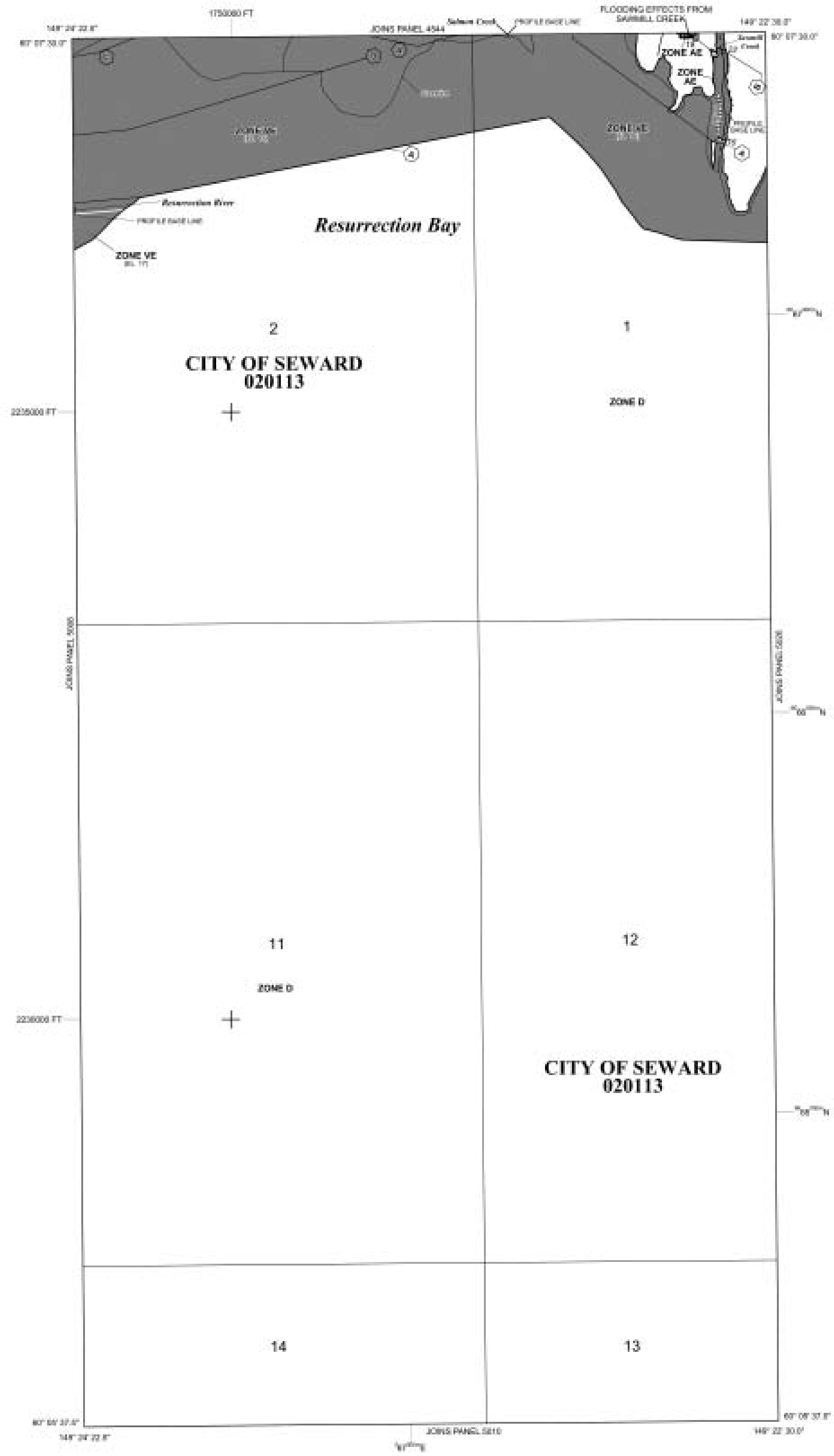


1750000 FT
149° 24' 22.5"
JOINS PANEL 4542
149° 22' 30.0"
60° 09' 22.5"
ZONE AE
(EL 65)
FLOODING EFFECTS FROM SALMON CREEK
ZONE AE
(EL 65)
FLOODING EFFECTS FROM SALMON CREEK
ZONE AE
PROFILE BASE LINE
Salmon Creek Split
ZONE AO
(DEPTH 2')
ZONE D
CHUGACH NATIONAL FOREST
KENAI PENINSULA BOROUGH
020012
ZONE D BOUNDARY COINCIDENT WITH FOREST BOUNDARY
2245000 FT
JOINS PANEL 4543
JOINS PANEL 4563
Salmon Creek
ZONE AH
NASH ROAD
CLYDE KING ROAD
ZONE AE
(EL 18)
FLOODING EFFECTS FROM RESURRECTION RIVER
2240000 FT
ZONE VE
(EL 16)
Resurrection Bay
CITY OF SEWARD
020113
Sawmill Creek
60° 07' 30.0"
149° 24' 22.5"
JOINS PANEL 5007
Shoreline
149° 22' 30.0"

Panel 4544


1745000 FT
149° 26' 15.0"
JOINS PANEL 4543
149° 24' 22.5"
60° 07' 30.0"
60° 07' 30.0"
RAILROAD
ALAMEDA
STREET
NORTHWESTERN CIRCLE
PORT AVENUE
FERRY
TERMINAL
FREIGHT DOCK ROAD
Shoreline
Resurrection River
ZONE VE
ZONE A
ZONE VE
CITY OF SEWARD
020113
2235000 FT
ZONE VE
JOINS PANEL 5005
JOINS PANEL 5007
MONROE STREET
MADISON STREET
JEFFERSON STREET
ADAMS STREET
SIXTH AVENUE
BALLAINE BOULEVARD
RAILWAY AVE
ZONE VE
Resurrection Bay
ZONE D
2230000 FT
CITY OF SEWARD
020113
ZONE VE
3
2
10
11
15
14
60° 05' 37.5"
149° 26' 15.0"
JOINS PANEL 5010
60° 05' 37.5"
149° 24' 22.5"

Panel 5006


1753000 FT
JOINS PANEL 4544
Salmon Creek
PROFILE BASE LINE
FLOODING EFFECTS FROM
SAWMILL CREEK
ZONE AE
ZONE
AE
Resurrection River
PROFILE BASE LINE
Resurrection Bay
ZONE VE
2
1
CITY OF SEWARD
020113
ZONE D
2235000 FT
11
12
ZONE D
2236000 FT
CITY OF SEWARD
020113
14
13
JOINS PANEL 5010

Panel 5007

Appendix I-Complete HEC-RAS Output Results for All Hydraulic Models

Resurrection River Existing Conditions Model 100-year Flood - HEC-RAS Standard Table 1

Reach	River Station	Total Discharge	Minimum Channel Elevation	Water Surface Elevation	Critical Water Surface Elevation	Energy Gradeline Elevation	Energy Gradeline Slope	Channel Velocity	Flow Area	Top Width	Froude Number
	(ft)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Resurrection R	144	29160	2.29	12.63	10.47	12.79	0.001	3.49	11237.39	8100.84	0.3
Resurrection R	698	29160	2.09	13.44	12.29	13.73	0.002172	6.52	8432.63	7559.62	0.45
Resurrection R	1336	29160	7.81	13.91	8.23	13.95	0.000103	1	21357.56	5470.5	0.1
Resurrection R	1791	29160	7.22	13.97	11.5	14.1	0.00191	2.67	10254.3	3669.35	0.35
Resurrection R	2432	29160	5.18	15.24	12.98	15.35	0.002159	3.41	11151.41	3775.97	0.38
Resurrection R	3094	29160	9.35	17.12	15.29	17.33	0.004453	5.29	8899.99	3243.36	0.58
Resurrection R	3589	29160	12.51	19.15	17.61	19.52	0.005828	6.32	6570.57	2699.78	0.66
Resurrection R	3950	29160	11.1	20.98	19.63	21.23	0.003442	4.95	7516.93	3273.47	0.52
Resurrection R	4460	29160	14.88	22.24	21.12	22.53	0.002713	4.7	7042.58	3322.53	0.47
Resurrection R	4994	29160	15.53	24	23.01	24.28	0.004179	5.53	7324.38	3339.32	0.57
Resurrection R	5408	29160	17.98	25.77	24.56	26.07	0.004017	5.1	7323.43	3694.93	0.55
Resurrection R	6068	29160	21.15	28.31	27.59	28.71	0.003922	6.35	7595.72	3725.94	0.58
Resurrection R	6545	29160	22.38	30.21	29.72	30.95	0.004728	7.62	5581.69	3005.11	0.64
Resurrection R	7067	29160	22.72	32.52	32.24	33.73	0.006862	9.21	3994.18	2706.98	0.78
Resurrection R	7482	29160	21.42	35.58	31.89	35.83	0.003422	3.65	7728.7	2492.63	0.27

Resurrection River Alternative 1.1 Model 100-year Flood - HEC-RAS Standard Table 1

Reach	River Station	Total Discharge	Minimum Channel Elevation	Water Surface Elevation	Critical Water Surface Elevation	Energy Gradeline Elevation	Energy Gradeline Slope	Channel Velocity	Flow Area	Top Width	Froude Number
	(ft)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Resurrection R	144	29160	2.29	12.63	10.47	12.79	0.001	3.49	11237.39	8100.84	0.3
Resurrection R	698	29160	2.09	13.44	12.29	13.73	0.002172	6.52	8432.63	7559.62	0.45
Resurrection R	1336	29160	7.81	15.47	15.11	16.3	0.00555	9.43	6438.17	4124.5	0.74
Resurrection R	1791	29160	7.22	17.58	15.87	17.92	0.00201	5.53	9177.76	4329.76	0.43
Resurrection R	2432	29160	5.18	19.1	17.53	19.47	0.002471	6.68	9648.79	4388.34	0.47
Resurrection R	3094	29160	9.35	21.16	18.63	21.31	0.002467	3.26	9231.95	3828.45	0.25
Resurrection R	3589	29160	12.51	22.02	20.09	22.29	0.001866	4.7	8218.07	3325.18	0.4
Resurrection R	3950	29160	11.1	22.74	21.12	23.01	0.00209	5.06	7784.23	2745.25	0.42
Resurrection R	4460	29160	14.88	23.63	22.02	23.96	0.002387	5.64	7624.6	2796	0.47
Resurrection R	4994	29160	15.53	25.02	23.58	25.37	0.003535	6.18	8015.95	2927.56	0.55
Resurrection R	5408	29160	17.98	26.56	25.01	26.86	0.003166	5.37	8219.95	3866.15	0.51
Resurrection R	6068	29160	21.15	28.71	27.98	29.22	0.003806	6.7	7623.2	3452.88	0.58
Resurrection R	6545	29160	22.38	30.51	29.72	31.18	0.003854	7.18	5594.68	2722.59	0.58
Resurrection R	7067	29160	22.72	32.49	32.14	33.73	0.007011	9.28	3955.54	2199.69	0.79
Resurrection R	7482	29160	21.42	35.59	31.89	35.84	0.003391	3.64	7748.24	2372.27	0.27

Resurrection River Alternative 2.2 Model 100-year Flood - HEC-RAS Standard Table 1

Reach	River Station	Total Discharge	Minimum Channel Elevation	Water Surface Elevation	Critical Water Surface Elevation	Energy Gradeline Elevation	Energy Gradeline Slope	Channel Velocity	Flow Area	Top Width	Froude Number
	(ft)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Resurrection R	144	29160	2.29	12.63	10.47	12.79	0.001	3.49	11237.39	8100.84	0.3
Resurrection R	698	29160	2.09	13.44	12.29	13.73	0.002172	6.52	8432.63	7559.62	0.45
Resurrection R	1336	29160	7.81	13.91	8.23	13.95	0.000103	1	21357.56	5470.5	0.1
Resurrection R	1791	29160	7.22	13.9	12.39	14.16	0.004293	3.96	7115.37	2860.79	0.52
Resurrection R	2432	29160	5.18	15.94	13.47	16.13	0.002412	4.12	8654.95	3152.48	0.4
Resurrection R	3094	29160	9.35	17.9	15.23	18.09	0.003787	3.66	8274.8	2480.17	0.38
Resurrection R	3589	29160	12.51	19.59	17.52	19.88	0.004582	5.3	7344.26	2514.5	0.55
Resurrection R	3950	29160	11.1	21.16	19.75	21.43	0.003648	5.07	7384.36	2881.82	0.5
Resurrection R	4460	29160	14.88	22.52	21.1	22.81	0.002919	5.16	7277.65	2886.94	0.49
Resurrection R	4994	29160	15.53	24.25	23.03	24.56	0.003905	5.65	7124.58	2977.52	0.56
Resurrection R	5408	29160	17.98	25.94	24.71	26.27	0.003939	5.24	6854.12	3423.81	0.55
Resurrection R	6068	29160	21.15	28.56	27.98	29.15	0.004568	7.16	6959.14	3297.62	0.63
Resurrection R	6545	29160	22.38	30.55	29.72	31.17	0.003577	6.96	5903.48	2845.62	0.56
Resurrection R	7067	29160	22.72	32.42	32.24	33.72	0.007497	9.49	3837.62	2157.91	0.81
Resurrection R	7482	29160	21.42	35.62	31.89	35.87	0.003323	3.62	7792.32	2374.37	0.27

Resurrection River Alternative 3.0 Model 100-year Flood - HEC-RAS Standard Table 1

Reach	River Station	Total Discharge	Minimum Channel Elevation	Water Surface Elevation	Critical Water Surface Elevation	Energy Gradeline Elevation	Energy Gradeline Slope	Channel Velocity	Flow Area	Top Width	Froude Number
	(ft)	(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Resurrection R	144	29160	2.29	12.63	10.47	12.79	0.001	3.49	11237.39	8100.84	0.3
Resurrection R	698	29160	2.09	13.44	12.29	13.73	0.002172	6.52	8432.63	7559.62	0.45
Resurrection R	1336	29160	7.81	14.16	9.7	14.24	0.000354	1.59	13670.97	4596.04	0.15
Resurrection R	1791	29160	7.22	14.45	12.38	14.63	0.002673	3.44	8639.81	3364.16	0.43
Resurrection R	2432	29160	5.18	15.99	13.47	16.18	0.002335	4.09	8801.9	3212.01	0.4
Resurrection R	3094	29160	9.35	17.91	15.23	18.1	0.003766	3.65	8290.38	2485.93	0.37
Resurrection R	3589	29160	12.51	19.58	17.54	19.87	0.004485	5.28	7303.85	2501.33	0.55
Resurrection R	3950	29160	11.1	21.11	19.69	21.38	0.003521	4.9	7217.75	2832.71	0.49
Resurrection R	4460	29160	14.88	22.45	21.07	22.74	0.002925	5.09	7091.07	2853.5	0.49
Resurrection R	4994	29160	15.53	24.21	23.03	24.53	0.004061	5.72	7018.85	2965.58	0.57
Resurrection R	5408	29160	17.98	25.97	24.75	26.31	0.004089	5.38	6912.41	3454.44	0.56
Resurrection R	6068	29160	21.15	28.6	27.98	29.17	0.004346	7.03	7082.23	3310.56	0.62
Resurrection R	6545	29160	22.38	30.54	29.72	31.17	0.003624	7	5869.84	2832.07	0.56
Resurrection R	7067	29160	22.72	32.43	32.24	33.72	0.007438	9.47	3851.26	2162.53	0.81
Resurrection R	7482	29160	21.42	35.62	31.89	35.86	0.003331	3.62	7787.12	2374.2	0.27

Resurrection River Existing Conditions Model 100-year Flood - HEC-RAS Standard Table 2

Reach	River Station	Energy Gradeline Elevation	Water Surface Elevation	Velocity Head	Friction Loss	Contraction And Expansion Loss	Discharge Left Overbank	Discharge Channel	Discharge Right Overbank	Top Width
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Main	144	12.79	12.63	0.16			4845.73	17997.81	6316.46	8100.84
Main	698	13.73	13.44	0.29	0.9	0.04	16622.92	8518.95	4018.14	7559.62
Main	1336	13.95	13.91	0.03	0.19	0.03	485.52	1296.84	27377.64	5470.5
Main	1791	14.1	13.97	0.13	0.13	0.03	377.74	2841.23	25941.03	3669.35
Main	2432	15.35	15.24	0.11	1.25	0	595.85	3079.65	25484.51	3775.97
Main	3094	17.33	17.12	0.21	1.95	0.03	1467.54	7734.58	19957.88	3243.36
Main	3589	19.52	19.15	0.37	2.14	0.05	2094.13	11241.82	15824.05	2699.78
Main	3950	21.23	20.98	0.25	1.69	0.01	6474.65	8376.83	14308.53	3273.47
Main	4460	22.53	22.24	0.29	1.29	0.01	5146.21	9733.63	14280.17	3322.53
Main	4994	24.28	24	0.29	1.76	0	4127.23	9447.72	15585.04	3339.32
Main	5408	26.07	25.77	0.29	1.78	0	1180.16	12264.79	15715.04	3694.93
Main	6068	28.71	28.31	0.41	2.61	0.03	4554.81	17040.59	7564.61	3725.94
Main	6545	30.95	30.21	0.74	2.14	0.1	3241.72	23284.41	2633.88	3005.11
Main	7067	33.73	32.52	1.22	2.64	0.14	1861.17	26091.15	1207.69	2706.98
Main	7482	35.83	35.58	0.24	2	0.1	2063.33	27089.45	7.22	2492.63

Resurrection River Alt 1.1 Model 100-year Flood - HEC-RAS Standard Table 2

Reach	River Station	Energy Gradeline Elevation	Water Surface Elevation	Velocity Head	Friction Loss	Contraction And Expansion Loss	Discharge Left Overbank	Discharge Channel	Discharge Right Overbank	Top Width
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Main	144	12.79	12.63	0.16			4845.73	17997.81	6316.46	8100.84
Main	698	13.73	13.44	0.29	0.9	0.04	16622.92	8518.95	4018.14	7559.62
Main	1336	16.3	15.47	0.83	2.41	0.16	12422.45	16516.23	221.32	4124.5
Main	1791	17.92	17.58	0.33	1.56	0.05	9609.94	19524.41	25.65	4329.76
Main	2432	19.47	19.1	0.37	1.54	0.01	14940.19	14168.1	51.71	4388.34
Main	3094	21.31	21.16	0.16	1.82	0.02	14249.61	14818.79	91.6	3828.45
Main	3589	22.29	22.02	0.27	0.94	0.03	7716.77	21441.83	1.4	3325.18
Main	3950	23.01	22.74	0.27	0.72	0	14984.05	14129.03	46.93	2745.25
Main	4460	23.96	23.63	0.33	0.94	0.02	10766.81	16895.06	1498.13	2796
Main	4994	25.37	25.02	0.35	1.4	0	7771.4	14365.53	7023.07	2927.56
Main	5408	26.86	26.56	0.3	1.49	0	3155.42	16781.24	9223.34	3866.15
Main	6068	29.22	28.71	0.51	2.3	0.06	6710.14	19921.37	2528.49	3452.88
Main	6545	31.18	30.51	0.67	1.92	0.05	4147.91	23434.85	1577.24	2722.59
Main	7067	33.73	32.49	1.23	2.38	0.17	1834.78	26140	1185.23	2199.69
Main	7482	35.84	35.59	0.24	2.01	0.1	2086.65	27065.87	7.48	2372.27

Resurrection River Alt 2.2 Model 100-year Flood - HEC-RAS Standard Table 2

Reach	River Station	Energy Gradeline Elevation	Water Surface Elevation	Velocity Head	Friction Loss	Contraction And Expansion Loss	Discharge Left Overbank	Discharge Channel	Discharge Right Overbank	Top Width
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Main	144	12.79	12.63	0.16			4845.73	17997.81	6316.46	8100.84
Main	698	13.73	13.44	0.29	0.9	0.04	16622.92	8518.95	4018.14	7559.62
Main	1336	13.95	13.91	0.03	0.19	0.03	485.52	1296.84	27377.64	5470.5
Main	1791	14.16	13.9	0.27	0.14	0.07	510.62	4028.52	24620.86	2860.79
Main	2432	16.13	15.94	0.19	1.96	0.01	1427.12	4745.95	22986.93	3152.48
Main	3094	18.09	17.9	0.19	1.96	0	2538.09	7075.33	19546.57	2480.17
Main	3589	19.88	19.59	0.29	1.76	0.03	2622.34	12525.4	14012.27	2514.5
Main	3950	21.43	21.16	0.27	1.55	0	7578.2	11084.69	10497.11	2881.82
Main	4460	22.81	22.52	0.28	1.38	0	6261.88	11651.85	11246.28	2886.94
Main	4994	24.56	24.25	0.31	1.74	0.01	4787.21	10481.03	13891.76	2977.52
Main	5408	26.27	25.94	0.33	1.71	0.01	1454.42	13361.74	14343.84	3423.81
Main	6068	29.15	28.56	0.59	2.8	0.08	6341.96	20489.9	2328.14	3297.62
Main	6545	31.17	30.55	0.62	2.02	0.01	4193.44	22926.32	2040.24	2845.62
Main	7067	33.72	32.42	1.3	2.34	0.2	1758.28	26286.44	1115.27	2157.91
Main	7482	35.87	35.62	0.24	2.04	0.11	2139.15	27012.79	8.07	2374.37

Resurrection River Alt 3.0 Model 100-year Flood - HEC-RAS Standard Table 2

Reach	River Station	Energy Gradeline Elevation	Water Surface Elevation	Velocity Head	Friction Loss	Contraction And Expansion Loss	Discharge Left Overbank	Discharge Channel	Discharge Right Overbank	Top Width
		(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Main	144	12.79	12.63	0.16			4845.73	17997.81	6316.46	8100.84
Main	698	13.73	13.44	0.29	0.9	0.04	16622.92	8518.95	4018.14	7559.62
Main	1336	14.24	14.16	0.09	0.49	0.02	1145.24	2213.36	25801.4	4596.04
Main	1791	14.63	14.45	0.18	0.36	0.03	805.58	4717.96	23636.46	3364.16
Main	2432	16.18	15.99	0.19	1.56	0	1434.02	4793.25	22932.73	3212.01
Main	3094	18.1	17.91	0.19	1.92	0	2544.37	7064.68	19550.95	2485.93
Main	3589	19.87	19.58	0.29	1.74	0.03	2569.28	12372.07	14218.64	2501.33
Main	3950	21.38	21.11	0.27	1.51	0	7177.16	10446.54	11536.29	2832.71
Main	4460	22.74	22.45	0.29	1.35	0.01	6015.98	11242.69	11901.33	2853.5
Main	4994	24.53	24.21	0.32	1.78	0.01	4750.6	10487.19	13922.21	2965.58
Main	5408	26.31	25.97	0.34	1.78	0	1568.21	13904.29	13687.5	3454.44
Main	6068	29.17	28.6	0.57	2.79	0.07	6449.49	20340.38	2370.13	3310.56
Main	6545	31.17	30.54	0.63	1.98	0.02	4161.53	22972.6	2025.87	2832.07
Main	7067	33.72	32.43	1.29	2.35	0.2	1766.94	26269.58	1123.49	2162.53
Main	7482	35.86	35.62	0.24	2.04	0.1	2132.96	27019.04	8	2374.2

HYDRAULIC MAPPING AND MODELING
Kenneth F. Karle, P.E.
1091 West Chena Hills Drive, Fairbanks, AK 99709

July 6, 2016

Memorandum

To: Royce Conlon, P.E., PDC Inc. Engineers

From: Kenneth Karle, P.E., Hydraulic Mapping and Modeling

Subject: River Behavior Considerations for Channel Excavation

There appears to be continued interest from the public and others in investigating the use of channel diversion through excavation as a potential method to solve the flooding problems at the Seward Airport. This memo provides a brief explanation of the geomorphology of braided rivers and the hydraulic forces involved in bedload transport and deposition, and should provide additional justification, if needed, for the decision to select an alternative that does not include large-scale excavation of a new channel segment in the Resurrection River alluvial fan delta.

Braided River Geomorphology-The upper 8 miles of the Resurrection River takes the form of a meandering channel confined within a narrow meandering canyon. The channel transforms into a braided river as multiple glacially-fed tributaries provide water and sediment input, and ultimately transforms into an alluvial fan delta for approximately three miles before flowing into Resurrection Bay. Salmon Creek and Japanese Creek also provide water and sediment input to the alluvial fan delta.

The alluvial fan delta is braided in nature, and consists of interconnected distributary channels formed in coarse depositional materials. River conditions that are universally attributed to braided rivers include high bank sediment supply upstream, high bank erodibility, little to no vegetation, moderately steep gradients, and flashy runoff conditions which vary from low to high flows frequently (Leopold et al, 1964, and others).

Braided rivers are generally found in steep valleys relative to other types of rivers. A common explanation for braiding states that a river needs to dissipate energy as it moves downstream. Otherwise, velocity would continue to increase, which leads to downcutting and channel erosion. However, since many rivers cannot downcut because they discharge into a water body with fixed elevation, other actions are needed to dissipate energy. By braiding, a river increases its overall length, decreases its slope, and increases the amount of energy dissipated in longer channels and in bends. Equilibrium is maintained between energy gained and energy lost. The fan delta becomes a depositional zone to maintain its grade.

Though commonly referred to as a floodplain, the wide braided gravelly and unvegetated area where the channels, both active and abandoned, and gravel bars are located are not technically floodplains, but rather part of the active fan delta.

Sediment Deposition-The shear stress at the bed τ_o is the force of moving water against the channel bed. Referred to as the tractive force, it determines the power of flow to dislodge and transport sediment particles. The equation for shear stress for steady gradually varied flow is:

$$\tau_o = \gamma R S$$

Where τ_o = bed shear stress
γ = specific weight of water
R = hydraulic radius
S = friction slope

As the slope S decreases, the shear stress decreases, along with the power to dislodge and transport sediment. Sediment in transport will settle out with a shallower slope.

For the 8500 foot reach upstream of the Seward Highway Bridge, the Resurrection River has an average slope of 0.005 feet/feet. The bed slope is relatively consistent; see Figure 1. In natural river systems, slopes are steepest near the headwaters and gradually flatten out near the mouth. This holds true for the Resurrection River as well. Downstream of the Seward Highway/ARRC bridges, the slope flattens out considerably. Resurrection Bay provides a fixed elevation water body (aside from tidal range). Unable to downcut, the river braids, decreases its slope, deposits sediment, and dissipates energy. The fan delta becomes a depositional zone to maintain its grade.

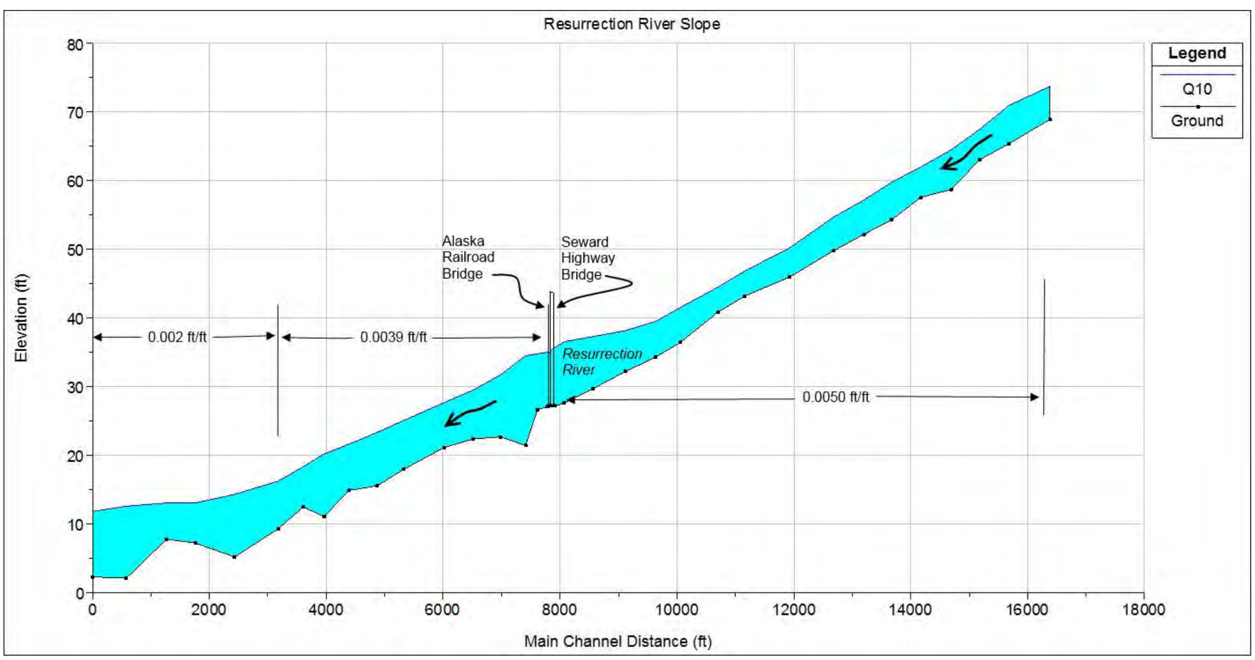


Figure 1. Resurrection River channel slopes.

Though there are several processes that are responsible for braiding, it is important to note the time frame in which these processes can occur. Researchers have noted that "Individual channels and bars in such rivers can evolve, migrate, and switch position within days or hours of competent flow, so that the overall pattern is bewilderingly variable and complex." (Ferguson et al, 1992). Others have noted that though some processes require high water stages, some do not, and braiding can occur at constant discharges.

Resurrection River Bedload Rates and Sediment Deposition-I have been unable to locate estimates of annual bedload rates for the Resurrection River; however, the general consensus is that the bedload rates are high. Multiple reports provide descriptions of high bedload rates, active channel migration, and severe sediment deposition. The Alaska Railroad estimates that the 1995 Resurrection River flood event dumped 60,000 cubic yards of sediment in the ARR docking harbor just off the east end of the river (T. Brooks, personal communication). The Corps of Engineers notes that Seward drainages carry glacial debris that is deposited in the streams and added to the alluvial fans at outlets (COE, 2008). A report by a multi-agency task force formed to pursue a comprehensive solution to flooding in Seward noted that:

> "..streams tributary to Resurrection River drain steep glaciated subbasins and deposit large quantities of coarse bed materials in alluvial fans at their mouths. These deposited materials are subsequently picked up and moved downstream through the Resurrection River valley, particularly during flood flows. Transport of these materials constantly modifies the major stream channels. The river migrates back and forth through many distributaries located in a flood plain ranging up to 1 mile in width."(Task Force, 1998).

A report by the Seward/Bear Creek Flood Service Area notes that streams in the Resurrection Bay watershed carry huge amounts of gravel and debris which:

> "guarantees that they will naturally meander over alluvial fans or through braided channels and definitely refuse to stay in one place." (SBCFSA, 2009).

A series of aerial photographs of the Seward Airport area, stretching from 1950 through 2014, documents the channel migration of the Resurrection River to the southwest across the alluvial fan delta. See Appendix 1 of this memo.

Excavation of active fan deltas has been conducted frequently in Alaska, primarily to utilize the gravel. For example, a long-term gravel excavation program on the Toklat River in Denali National Park and Preserve is unique within the national park system; its success is due to the high bedload and quick replenishment rates that refill the excavated channels within a few years or less (Karle, 2010).

MHW completed a study of river processes along another wide braided river system in Southcentral Alaska for the NRCS in order to assess various options to control bank erosion. The 2004 study, *'Matanuska River Erosion Assessment Design Study Report'* (USDA, 2004) focuses on a study area that encompassed the river floodplain from the Old Glenn Highway Bridge downstream approximately 6 miles to the Bodenburg Butte area. The NRCS report included an extensive study of gravel removal as a bank erosion protection alternative. Channel excavations would be designed to reduce velocities and stresses on banks during high and moderate flow events (USDA, 2004).

The study utilized computer modeling to estimate the effect of channel excavations on flow pattern, hydraulic characteristics, and sediment transport. Excavated trenches were created within the river model and analyzed. The modeled trenches were 10 feet deep, 500 feet wide, and 2500, 3300, and 6500 feet long. The study authors acknowledged that such excavation requires construction practices of a large-scale mining operation. To be effective during moderate floods (2- to 10-year flood), the initial modeling involved the removal of approximately 2.2 million cubic yards of material. The authors noted that additional planning and modeling was needed to adjust the trenches to maximize effectiveness.

The following paragraph from the NRCS report describes a major disadvantage to this alternative. Italics have been added for emphasis.

> "From a geomorphologic perspective, the behavior of the excavated channels is of concern on the Matanuska River, since natural river instability may impact the effectiveness of the trenches to re-direct flows and reduce water levels. Since *braided channels characteristically exhibit irregular and unpredictable morphologic development, there can be no guarantee* that the proposed excavations will remain stable for a significant time period (i.e. multiple freshet seasons) to reduce flood levels and redirect flows, as intended. In addition, *there is a risk that bank erosion could continue* due to flow in the smaller subchannels even if the trenched channels are constructed. If an appreciable amount of the flow remains outside of the excavated channel, bank erosion may continue. In addition, flows through the initially straight excavations will likely erode their banks and eventually result in irregular excavated channel patterns with flow paths deviating from the constructed alignment." NRCS, 2004; p. 3-2.

Summary-Based on the general description of channel excavation for bank erosion control in the NRCS report, and the extensive experience of the authors with gravel excavation on braided rivers, I concur with ADOT&PF's recommendation that channel excavation is not a viable engineering solution to ameliorate or control flooding of the Seward Airport. There is no guarantee that an excavated channel would remain stable, or redirect flows, as intended, for the following reasons:

- Upstream of the Seward Highway Bridge, the Resurrection River, Salmon Creek and Japanese Creek all provide high inputs of sediment to the Resurrection River drainage.
- The slope of the alluvial fan delta downstream of the Seward Highway Bridge is less than the slope of the river upstream, creating a depositional environment.
- High sediment transport in the Resurrection River, even during low to moderate flows, could alter or fill an excavated channel on the alluvial fan delta within days.
- Remaining flow outside of the excavated channel may still cause sediment deposition, bank erosion, and flooding of the runway.

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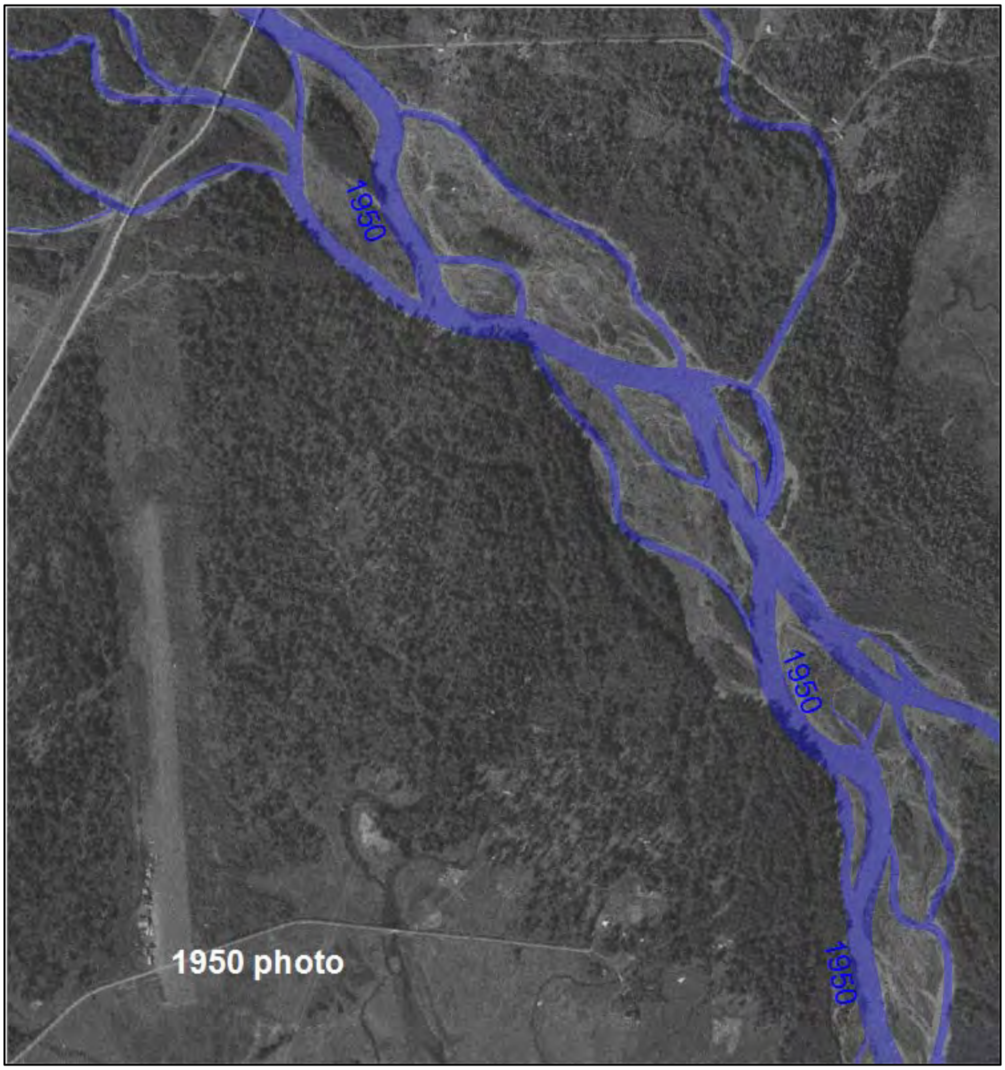
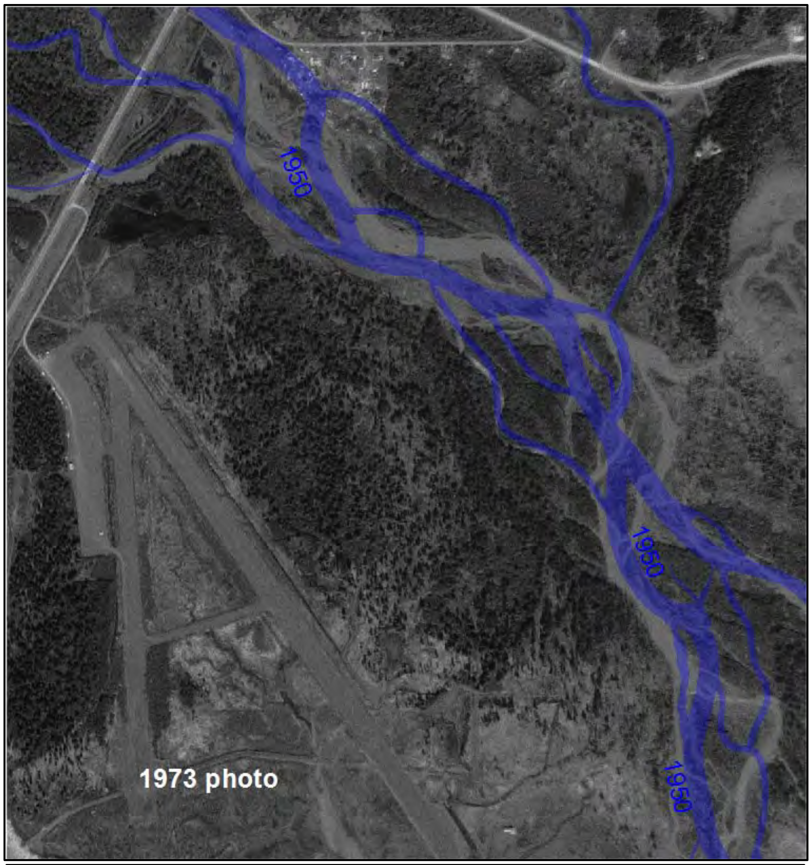
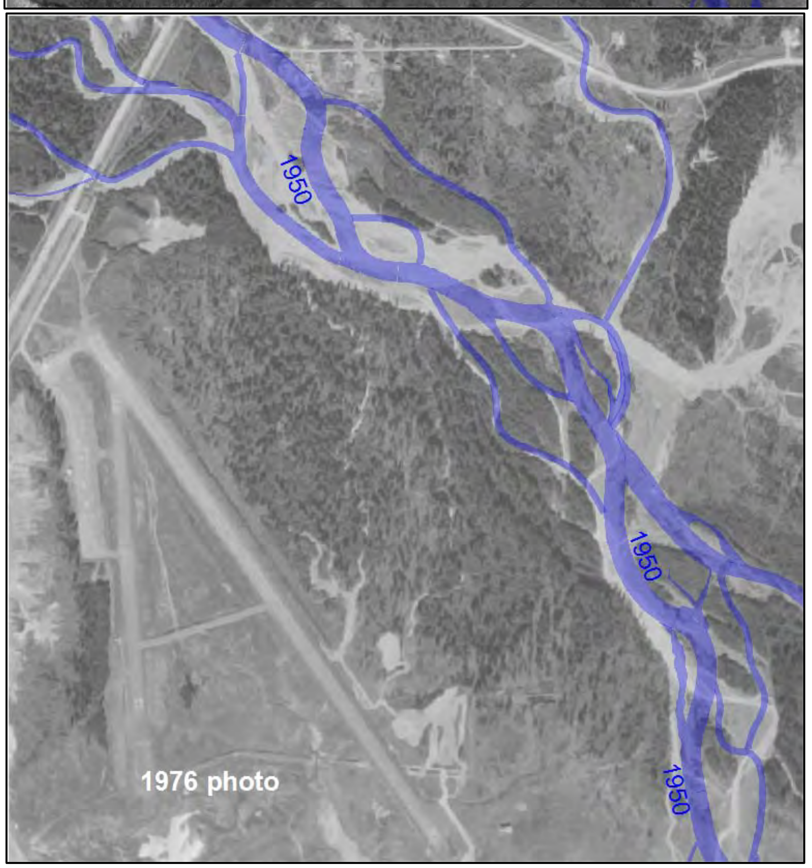
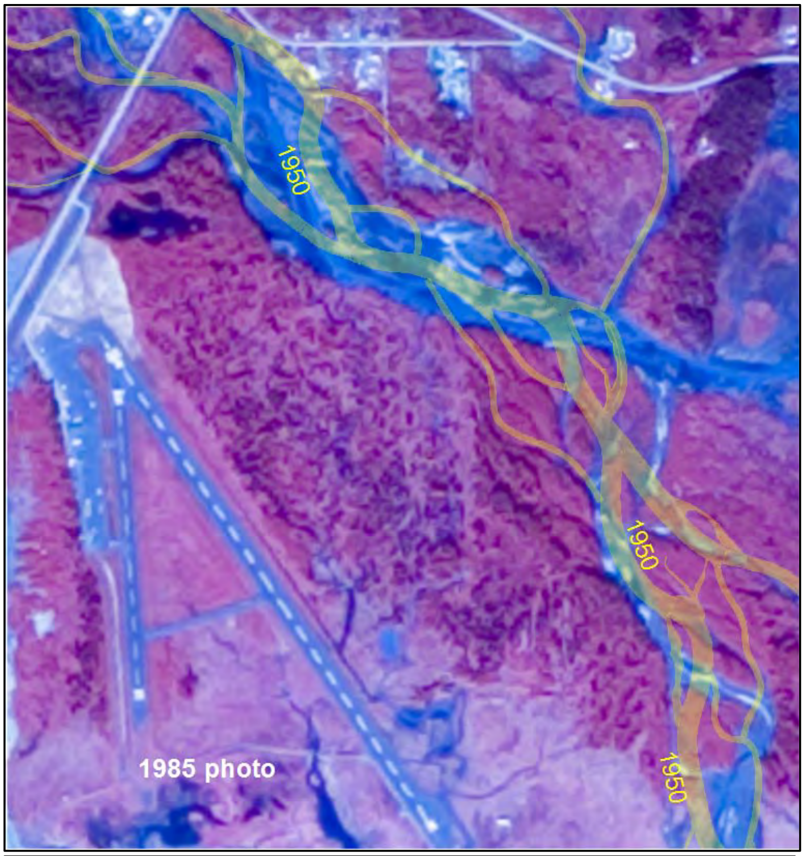
Appendix 1-Resurrection River Channel Locations, 1950 to 2014

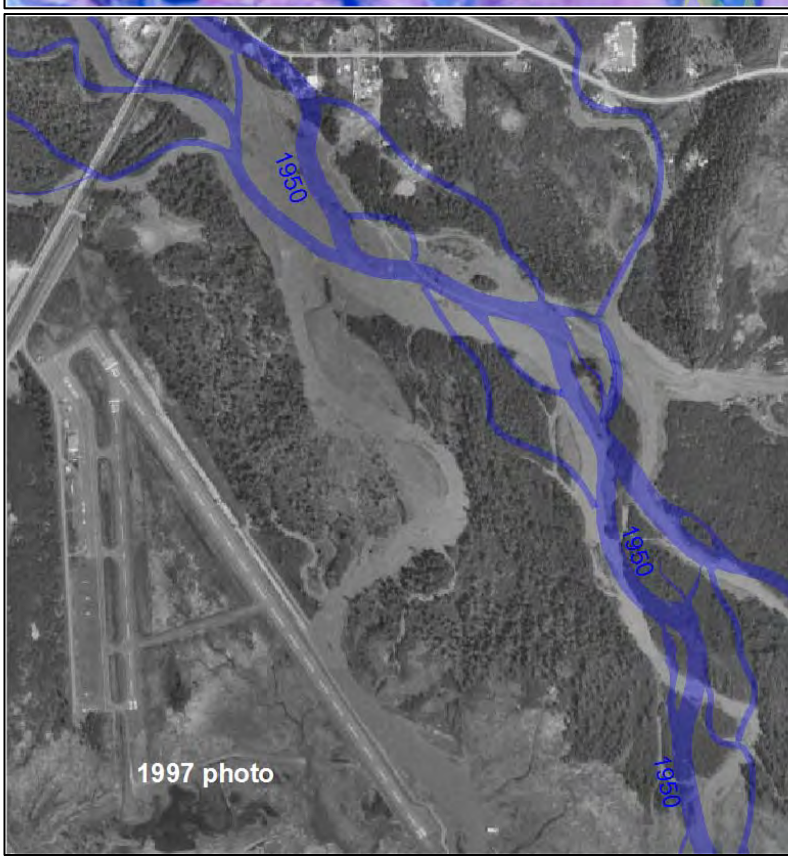
The approximate location of the Resurrection River channel in 1950 is shaded in blue, and overlain on the following aerial images: 1950, 1973, 1976, 1985 (infrared imagery-channel shaded in yellow), 1997, 2011, and 2014.



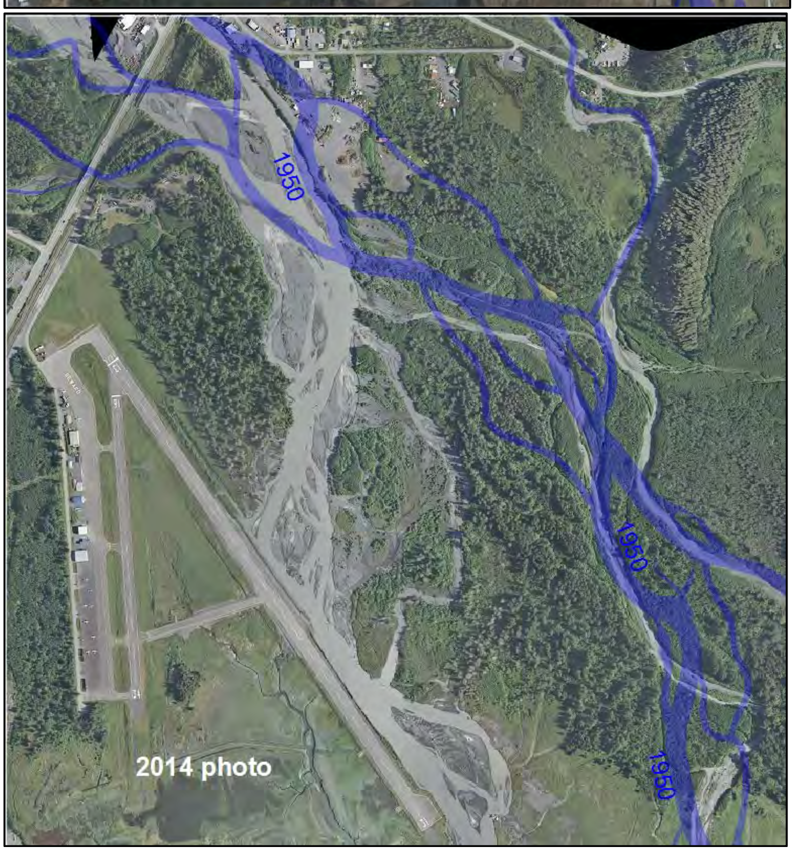

1950
1950
1950
1973 photo


1950
1950
1950
1976 photo


1950
1950
1950
1985 photo


1950
1950
1950
1997 photo


1950
1950
1950
2011 photo


1950
1950
1950
2014 photo

APPENDIX C1

Public Meetings

Table of Contents

Historic Preservation Plan needs public input

Fern Greenbank
LOG Editor

The draft of the Seward Historic Preservation Plan is ready for public comment, something Historic Preservation Commission members say it wants and needs in order to perform its required duties.

"The schedule was set, and we are on schedule," said French. "But I just don't think we have done enough to solicit public comment or see the draft before the next scheduled commission meeting."

The Historic Preservation Plan was actually written by a consultant firm, Nuka Research, and based on public comment solicited in the form of surveys and a public meeting April 22, 2014, which French said was poorly attended. He said he doesn't think the traditional required notice periods work well for a topic like historic preservation. The consultant also solicited input with online surveys and collected approximately 20 completed surveys.

Adopting a plan is a requirement for the city since it became a Certified Local Government. That designation requires the presence of a commission and a comprehensive plan. That designation allows the city to qualify for certain types of grants and expert assistance.

"I think the plan right now is mush," said French. "We may have to ask for an extension from the State Historic Preservation Office and apply for additional funds to gather more public comment."

There are three new members to the commission that have never been involved in a formal meeting or a work session about the plan, said French.

"It needs a concrete direction that people, and the City Council, can buy into," said French. "I still think the community profile reads like a condensed version of Mary Barry's 'Manifest Destiny' oriented community history."

The draft plan notes several challenges specific to Seward as well as opportunities. The draft written by the consultants focuses on the "fragile" nature of downtown Seward. When it comes to consideration of historic zoning downtown, the draft notes the concerns often expressed by business and homeowners that zoning is seen as too much regulation. The draft also points out that people are concerned about the cost of adhering to strict historic preservation guidelines present in formal zoned areas

Based on the public comments, the consultants noted in the draft that local government "expresses little support" for preservation efforts, in part because there are so many funding needs. Another challenge expressed was the conflict between economic and industrial development and preservation.

Because of the obstacles facing historic preservation efforts, the consultants focused the opportunities portion of the plan on education and public awareness in the hope that more information would result in more support for preservation efforts.

French said he thinks the commission has to be more proactive in its approach which starts with a stronger commitment expressed in the plan because it is this plan the commission will use as a roadmap for at least the next decade.

"I think we have a council currently that might be receptive to recommendations made by the commissioners,' said French.

One councilmember that has always been a big proponent of historic preservation and planning is Iris Darling, owner of the Brown and Hawkins Building which is on the National Register of Historic Places.

"I know some people really dislike the idea of an historic zone, because they don't like being told what to do," said Darling. "But honoring the state's history and the city's history is good for the city all the way around. It really is time we had an historic district."

Collecting data about the economic impact of historic preservation is something French wants the commission to consider. For example, programs like Main Street USA, administered by the National Trust for Historic Preservation, provides financial incentives and grants for business owners in historic areas to comply with regulations when repairs or remodeling is needed. Communities have to quaify for Main Street designation first.

French said there is plenty of evidence that historic tourism helps cities with heavy tourism industries during the off seasons and this is something Seward could benefit from.

From the city's perspective, said Assistant City Manager Ron Long, there is no preconceived idea or strong perceptions related to the plan.

"We really are waiting for the Commission to provide us and the City Council with recommendations," said Long. "We don't want to have an influence over public comment or the Commission's important work."

Copies of the draft can be accessed online or viewed the library. This comment period ends Friday, Sept. 5, though commission member John French says that is not long enough.

Public comment can be sent to michelleprior@nukaresearch.com or written comments can be delivered to the Seward Community Library front desk. All comments are due by Friday, Sept 5. The Seward Historic Preservation Commission will review and discuss the draft plan in a work session following their August 27 meeting. The plan can be accessed online at www.cityofseward.us/DocumentCenter/View/1997.

Lowell Point lagoon

From Page 1

quest for proposals gave potential contractors a large window for performance, otherwise the bids would have been much more expensive, he said.

When discussion moved back to the current smell, Councilwoman Iris Darling pressed Leman about emergency measures available to salvage businesses and residents' quality of life right now. The only viable option presented was calcium nitrate, which the city is already using to decrease the smell. Public Works Director WC Casey said he is using the manufacturers dosing schedule but agreed to go back and research more to see if additional nitrate is needed.

Councilman Dale Butts asked Leman who he goes to when he needs advice. Leman's initial response was himself, but did offer up some published authors as references he uses. Leman said he has asked the DEC for help with the air quality issue.

"They more or less said, good luck with that, so I went to the private sector for testing equipment," said Leman.

At one point, Leman said he wasn't aware there was anything wrong with the aerators, but was reminded that the aerators have a leak and air is escaping to places unknown, which causes the smell to increase.

Leman said the smell will get worse when the sludge removal begins and there are no plans currently in place to mitigate that issue. The council asked what other cities do when they experience this problem.

"Ponds are not usually so close to people," said Leman.

So, Councilwoman Christine Terry asked Leman specifically to find out what can be done.

"People are smelling this and having headaches," said Terry. "Is it mass hysteria? Real or perceived we have to do something. There are children at Lowell Point. This isn't new. This happens in other places."

To this remark, Leman said, he had gone out with his daughter Sunday night and didn't smell anything out at Lowell Point.

"We did smell it when we got by the SeaLife Center," said Leman. "I'm not saying it isn't possible, just that I didn't smell it on that night at that time."

Conversation moved to what is actually causing the smell. Leman said to get rid of the smell, you would first have to find out what is making the air smell. It could be a combination of gases such as carbon, ammonia, methane or hydrogen sulfide, he said.

"Can't you test for those gases," asked Councilman Butts? "What is it? Is it harmful? There may be something else. I don't believe this is just hydrogen sulfide."

Leman said it probably wasn't necessary because you don't need to test for carbon dioxide or oxygen and the equipment is currently showing a reading of "non-detect" for hydrogen sulfide, though it was revealed that the testing equipment is not completely outside, rather, it is housed in a unit with the doors open because the equipment installer was worried about rain damage, said Casey.

"What you are likely smelling are sulphur compounds, so you could start there," said Leman.

But, what can be done right now, asked Councilwoman Casagranda.

Casey said he would investigate higher dosing of calcium nitrate and look into aerators.

"We really are doing all we can," said Casey.

The entire work session lasted more than two hours and covered a lot of ground. Seward resident and environmental toxicologist gave Leman a run for his money with a master class in biology as French expressed concern that not enough is known about what is going on in the lagoon aerobically and anerobically.

No specific solutions were offered but the council and residents did have a chance to ask the engineer the city relies on how the lagoon problem got to this point of dysfunction and what can be done to salvage businesses and reduce health risk. Leman said the DEC's decision not to allow the city a bypass waiver to make sludge removal less expensive was a political decision.

Toward the end of the meeting, frustrated Lowell Point resident Lynda Paquette said there was an elephant in the room called "that attorney we don't have yet."

"What I'm hearing is that I pretty much can't take reservations for May or June," said Paquette. She asked the council to consider the cost of speeding up the dredging process versus the loss being sustained by Lowell Point residents.

Another Lowell Point business owner, John Page, told the council he needs some assurance that next summer the smell will be gone because he doesn't know if he can keep his returning staff.

"I do feel some support from the council," said Page. "I know it's not pleasant for any of us."

At this time, Leman and Casey and city management have been asked to negotiate with the contractor in a way that might speed up the process. The results of a seven day air quality testing period should be ready this week and they will be reviewed by council. In addition, the council asked the city manager to put the lagoon issue in every city manager's report for every council meeting.

Seward Airport Improvement Project (#54857)

Public Open-House Meeting

&

Notice of Intent to Conduct Preliminary Engineering Studies

The Alaska Department of Transportation and Public Facilities (DOT&PF), with the Federal Aviation Administration, has begun a project to improve the Seward Airport. The project's primary purpose is to make improvements that will substantially reduce further damage to airport facilities caused by the frequent flooding of the Resurrection River. The proposed project also will likely include runway/taxiway reconstruction, pavement rehabilitation, new airport lighting/electrical enclosure building, new navigational aids, and additional fencing and erosion control/armor. All alternatives identified will be subject to further environmental and engineering study.

Please stop by the public meeting any time during the hours below to learn more, help identify issues and concerns, and speak to a project team member.

Public Open House Meeting
Date: Thursday, September 11, 2014
Hours: 4 pm to 7 pm (stop by any time)
Project Overview Presentation: 15 minutes at 4:15 pm and 6:15 pm
Location: K.M. Rae Marine Education Building (lobby and auditorium)
Address: 201 Railway Avenue, Seward

Written comment may be given at the Open House, submitted via the website (www.dot.state.ak.us/creg/sewardairport/), email (solsticeak@solsticeak.com), or mail (Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, 2607 Fairbanks Street, Suite B, Anchorage, AK 99503) by September 26, 2014. For more information or to join the mailing list, visit www.dot.state.ak.us/creg/sewardairport/.

The DOT&PF complies with Title II of the Americans with Disabilities Act of 1990. Individuals with a hearing impairment can contact DOT&PF at a Telephone Device for the Deaf (TDD) at (907)269-0473. No person shall be excluded from participation in, or be denied benefits of any DOT&PF programs based on race, religion, color, gender, age, marital status, ability, or national origin.

Seward Airport Improvements Project

The Alaska Department of Transportation and Public Facilities (DOT&PF) has initiated preliminary studies and is collecting information to prepare for designing improvements to the Seward Airport. Learn more at an upcoming ***public meeting*** (see right) or on the project website, coming soon: www.dot.state.ak.us/creg/sewardairport/

The project team would like to hear your thoughts, ideas, and comments. Please come to the open house or send written comments (by September 26, 2014, please) to: Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503

Email: solsticeak@solsticeak.com

Seward Airport Improvements Project #54857

OPEN HOUSE PUBLIC MEETING
September 11, 2014

STOP BY any time between 4 and 7 pm

PRESENTATION at 4:15 and 6:15 pm

LOCATION:
K.M. Rae Marine Education Building, Seward Marine Center, 201 Railway Avenue, Seward

Please Come!

Seward Airport
Improvements Project
c/o Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, Alaska 99503

To:

Seward Airport Improvements Project (#54857)

Public Meeting #1 • Open House and Project Presentation • September 11, 2014

Meeting Agenda and Overview

Meeting Purpose

- To present the Seward Airport Improvements Project (including a project overview, existing conditions, issues heard so far, and schedule).
- To gather input from community members and local experts on issues and concerns.

Meeting Format

- **Open House Hours:** 4 pm to 7 pm
  - Please sign in and then visit the information stations (see detail below) in this lobby.
- **Project Overview Presentation**
  - Step into the auditorium at either 4:15 pm or 6:15 pm to listen to a 15 minute project presentation and overview.

Open House Stations

- **Station #1: Welcome and Sign in**
- **Station #2: Process Overview**
  - Begin with a “big picture” view of this project. Learn about the project process, including where we are in this project now, and how this process works to balance big-picture considerations.
- **Station #3: Existing Conditions**
  - Review what we have learned so far related to:
    - **Aviation Activity**
    - **Wind Coverage**
    - **Wetlands**
    - **Land Ownership and Zoning**
    - **Future Plans of Alaska Railroad Corporation (adjacent airport neighbor)**
  - Share your thoughts and ideas on these topics or others with a team member.
- **Station #4: Considerations and Issues**
  - Review an aerial photo highlighting known airport deficiencies.
  - Review federal floodplain mapping in detail to better understand this issue.
  - Share your thoughts with a team member.
- **Station #5: Next Steps**
  - Take a look at the project milestones and project phases to see what is coming next.
- **Station #6: Comment Station**
  - Your written comment is an important part of the process. You’ll find comment forms here.

Thank you for your time and participation!

Visit the project on the web at: www.dot.state.ak.us/creg/sewardairport/

Seward Airport Improvements Project (Project #54857)

Public Meeting #1 • Open House and Project Presentation • September 11, 2014

Voluntary Information Requested by the Civil Rights Office of the Alaska Department of Transportation and Public Facilities *

Thank you for your attendance today. Please sign in (legible print is appreciated)!

Name	Mailing Address	Email Address	Gender (Please Circle)	Race (Please Circle One)
GEORGE PECK	Bx 2244	gpeck@Arctic.net	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Christy Terry	PO Box 588 Swd AK 99664	terryc@akrr.com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Jeff Estes	PO Box 167 Seward	jestes@cityofseward.net	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
RONN HEMSTOCK	Box 2976	RONN@KPBSD.K12.AK	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Carol Griswold	Bx 1342	c-gri2@yahoo.com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Linda & Greg Thrall	25875 Primrose Rd Seward, AK 99664	gthrall@seward.net	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Jean Bardarson	Bx 689 Seward	jeanbardarson@gmail.com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Heidi Zemach	PO Box 1205 Seward, 99664	hzemach@gmail.com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Jean Bardarson, City Mayor, City address			Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
			Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
			Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
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			Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other

* The purpose of requesting this information is to ensure fair and equal representation by the public in all projects and programs administered by the Alaska Department of Transportation and Public Facilities.

Seward Airport Improvements Project (Project #54857)

Public Meeting #1 • Open House and Project Presentation • September 11, 2014

Thank you for your attendance today. Please sign in (legible print is appreciated)!

Voluntary Information Requested by the Civil Rights Office of the Alaska Department of Transportation and Public Facilities *

Name	Mailing Address	Email Address	Gender (Please Circle)	Race (Please Circle One)
Dennis Perry	PO Box 1802, Seward	bearlakepilot@gmail.com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
L&K Kurtz	SEWARD JOURNAL	SEWARDJOURNAL@GMAIL.COM SewardJournal.com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Mike Insalaco	PO Box 3505	mikei@ak.net	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Lucky Wilson	PO Box 685 Seward	AKLUCKYMAN@GMAIL.Com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Louis Bencardino	Box 95 Seward	bencardino1@[illegible].com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Denny Hamilton	Box 7 Seward	sewardair@[illegible]	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Bob Linville	Box 1753	Seward, AK 99664	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Walter Corrigan	Box 770	Seward, AK 99664	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Rhonda Mathis	Box 167	Seward AK 99664	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Stephanie Presley	Box 831	spresley@kpb.us Seward AK 99664	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Willard Dunham	B127	WILNBEV@AK.NET Seward 99664	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Fern Greenbank	PO Box 3304	editor@thesewardphoenixlog.com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Dan Mahalak	PO Box 2646	Dmahay@yahoo.com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
			Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
			Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
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Seward Airport Improvements Project (Project #54857)

Public Meeting #1 • Open House and Project Presentation • September 11, 2014

Voluntary Information Requested by the Civil Rights Office of the Alaska Department of Transportation and Public Facilities *

Thank you for your attendance today. Please sign in (legible print is appreciated)!

Name	Mailing Address	Email Address	Gender (Please Circle)	Race (Please Circle One)
Sean Montgomery	Box 1327 Soldotna AK 99669	sean.montgomery@alaska.gov	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Brooke Andrews	PO Box 1034 Seward AK 99664	akpreek@yahoo.com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Jerry Olson	Box 916 99664	olson steelers 54 @ G-mail. Com	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Donna Glenz	City of Seward, Box 167 99664	dglenz@cityofseward.net	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Kerry Martin	Box 816 Seward AK 99664		Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Cheryl Seese	PO 1971 Seward AK 99664	cseese@kpb.us ~~sheet~~	Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Jim Hunt City Manager	City of Seward PO Box 167 Seward AK		Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
[illegible]	— Seward		Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
[illegible] Leif Olson	Box 583 Seward		Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
Jim Cusack	11724 Seward AK 99664		Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
			Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
			Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
			Male/Female	White/Alaska Native/Native American/Black/Hispanic/Asian/Pacific Islander/Other
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Alaska Department of Transportation & Public Facilities

Seward Airport Improvements

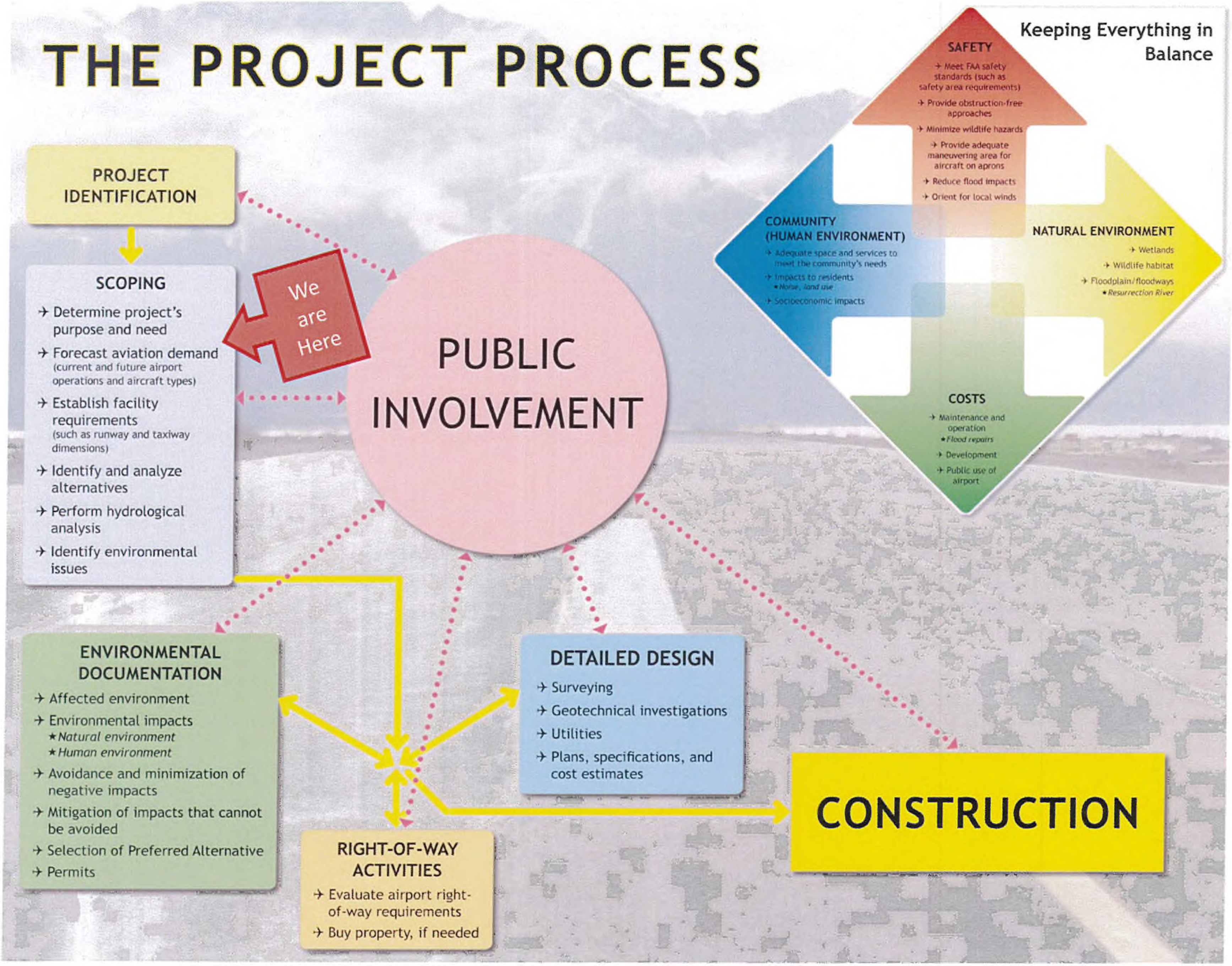
September 11, 2014

Welcome!

- Introductions
- Project process overview
- What we've learned, still gathering data
- Schedule

Project team

- **ADOT&PF**
  - Barbara Beaton, P.E.
    - Project Manager
  - Joy Vaughn, P.E.
    - Consultant Coordinator
- **PDC Engineers**
  - Royce Conlon, P.E.
    - Project Manager
  - Ken Risse, P.E.
    - Project Engineer
  - Patrick Cotter, AICP
    - Project Planner
- **Solstice Alaska**
  - Robin Reich
    - Public Involvement Coordinator/Biologist
  - Carla SlatonBarker
    - Public Involvement Specialist
- **Hydraulics & H Modeling**
  - Ken Karle, P.E.
    - Project Hydrologist
- **Shannon & Wilson**
  - Kyle Brennen, P.E.
    - Geotechnical Engineer



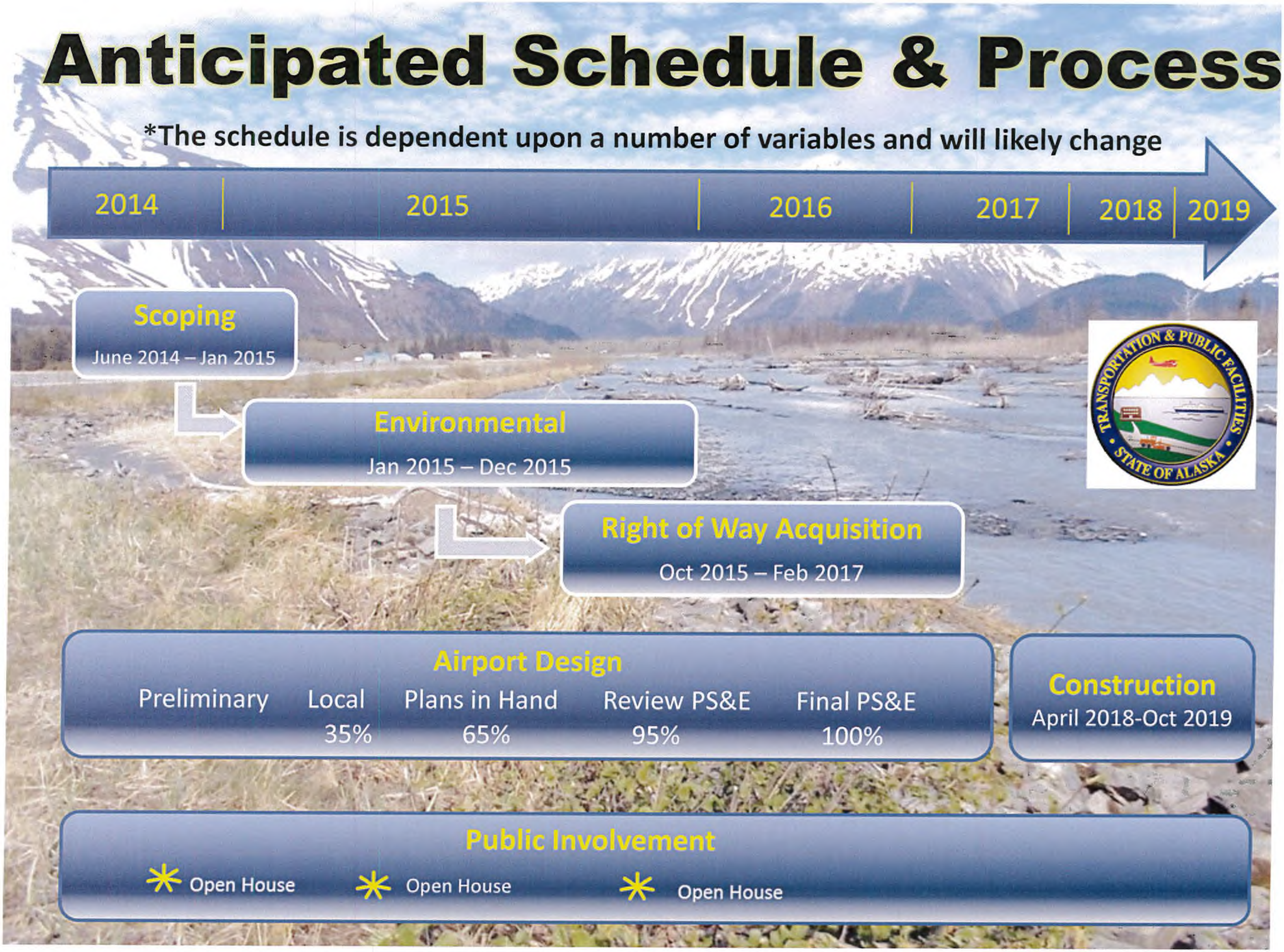
THE PROJECT PROCESS
PROJECT IDENTIFICATION
SCOPING
→ Determine project's purpose and need
→ Forecast aviation demand (current and future airport operations and aircraft types)
→ Establish facility requirements (such as runway and taxiway dimensions)
→ Identify and analyze alternatives
→ Perform hydrological analysis
→ Identify environmental issues
We are Here
PUBLIC INVOLVEMENT
Keeping Everything in Balance
SAFETY
→ Meet FAA safety standards (such as safety area requirements)
→ Provide obstruction-free approaches
→ Minimize wildlife hazards
→ Provide adequate maneuvering area for aircraft on aprons
→ Reduce flood impacts
→ Orient for local winds
COMMUNITY (HUMAN ENVIRONMENT)
→ Adequate space and services to meet the community's needs
→ Impacts to residents
• Noise, land use
→ Socioeconomic impacts
NATURAL ENVIRONMENT
→ Wetlands
→ Wildlife habitat
→ Floodplain/floodways
• Resurrection River
COSTS
→ Maintenance and operation
• Flood repairs
→ Development
→ Public use of airport
ENVIRONMENTAL DOCUMENTATION
→ Affected environment
→ Environmental impacts
★ Natural environment
★ Human environment
→ Avoidance and minimization of negative impacts
→ Mitigation of impacts that cannot be avoided
→ Selection of Preferred Alternative
→ Permits
DETAILED DESIGN
→ Surveying
→ Geotechnical investigations
→ Utilities
→ Plans, specifications, and cost estimates
RIGHT-OF-WAY ACTIVITIES
→ Evaluate airport right-of-way requirements
→ Buy property, if needed
CONSTRUCTION

Public Involvement Elements

- Public Meetings
- Stakeholder advisory group
- Newsletters
- Website w/ notifications of update
- Opportunity for Public Hearing
  (during review period for the Environmental Assessment)

Information Gathering

- Past, Present & Potential Future Aviation Activity
- Community Demographics
- Hydrology w/ potential new Floodplain Mapping
- Wind Data
- Geotechnical Information
- Environmental Conditions
- Adjacent Land Owners/Land Uses


Anticipated Schedule & Process
*The schedule is dependent upon a number of variables and will likely change
2014
2015
2016
2017
2018
2019
Scoping
June 2014 – Jan 2015
Environmental
Jan 2015 – Dec 2015
Right of Way Acquisition
Oct 2015 – Feb 2017
Airport Design
Preliminary
Local 35%
Plans in Hand 65%
Review PS&E 95%
Final PS&E 100%
Construction
April 2018-Oct 2019
Public Involvement
Open House
Open House
Open House
TRANSPORTATION & PUBLIC FACILITIES • STATE OF ALASKA •

Direct your written comments to:

Robin Reich
Public Involvement Lead
929-5960
Solsticeak@solsticeak.com

Website:
www.dot.state.ak.us/creg/sewardairport

MEMORANDUM

Date: September 15, 2014

To: Barbara Beaton, DOT&PF Project Manager

From: Robin Reich and Carla SlatonBarker (Solstice Alaska Consulting) with input and review from Royce Conlon, PDC Project Manager

Subject: Summary of 9/11/2014 Public Open-House Meeting for Seward Airport Improvements Project (#54857)

This document provides a summary of the public meeting held in Seward for the Seward Airport Improvements Project. The project presentation, meeting sign-in sheets, and scanned comment sheets are attached.

Meeting Overview

A public meeting was held September 11, 2014, at the Rae Building in Seward. The purpose of the meeting was to (1) present the Seward Airport Improvements Project (including a project overview, existing conditions, issues heard so far, and schedule) and (2) gather input from community members and local experts on issues and concerns. These purposes were explained at the welcome station verbally and were noted on the meeting agenda.

Meeting Format

The format of the meeting was an open house, meaning that people could come and go during the posted hours (4 pm to 7 pm) and visit information stations staffed by project team members. At 4:15 pm and 6:15 pm Royce Conlon, PDC project manager, provided a 15 minute project overview in the adjacent auditorium. The presentation explained the main topics presented on the open-house station boards. The presentation times were advertised in advance, posted at the meeting sign-in table, and announced during the meeting. Most attendees arrived near the time of the presentations, and most attendees reviewed the open-house information before or after the presentations. The presentation did not include a comment or question period; instead, attendees were asked to bring their questions and comments directly to team members at open-house stations.

Open House Stations/Meeting Information

The presentation slides (attached) provided a high-level overview of the project process, the team, and this phase of work. Stations around the lobby highlighted the information listed below. The goal of station staff was to explain the information (provide clarity) and to encourage people to review and provide comment on issues or concerns.

- Station #1: Welcome and Sign in
- Station #2: Process Overview Graphic

- Station #3: Existing Conditions, related to:
  - Aviation Activity
  - Wind Coverage
  - Wetlands
  - Land Ownership and Zoning
  - Future Plans of Alaska Railroad Corporation (adjacent airport neighbor)
- Station #4: Considerations and Issues
  - Known airport deficiencies
  - Federal floodplain mapping (FIRM map) to show the airport facilities in relative to the flood hazard zones.
- Station #5: Next Steps Schedule Graphic
- Station #6: Comment Station

Attendees

The following list reports information pertaining to attendance:

- 33 people signed in.
- Two people declined signing in.
- Five project team members were in attendance (two from DOT&PF and three from the consultant team).
- Most people's "affiliation" was noted as either pilot, lease holder, media (three local media outlets), City (city manager, planners, mayor in attendance—including some not currently in office/retired), Borough, floodplain interest, or ARRC interest.
- Six people filled out the voluntary information requested by DOT&PF's Civil Rights Office pertaining to gender and race.
- Seven completed comment sheets (attached) were collected at the close of the meeting.
- Many attendees noted that the meeting was very successful in terms of attendance, saying that most public meetings are more sparsely attended.

Meeting Notification

Table 1 provides a list of the mechanisms used to notify the community about the meeting.

Table 1. Notification Mechanisms

Notification Mechanism	Date/Details
Display Advertisement: Seward Phoenix Log	Published 08/21/14, 08/28/14, 09/04/14
Postcard Notice (mailed to 185 people on mailing list)	Mailed 9/5/2014
Email Announcement to City List (pdf of postcard to City)	Emailed to City 9/3/14; City confirmed and sent to City list
Chamber of Commerce Announcement	Emailed to City 9/3/14; forwarded by City to Chamber

Flyers Posted in Town (Posted by City; using postcard design)	Posted the week of 9/3/14
Personal Announcement Calls (to airport lease holders/ pilots who participated in summer pilot survey	Calls made 9/9/2014

Comment Summary and Themes

Five general comment themes were heard during the meeting: (1) comments on this public meeting, (2) comments on project process and communication, (3) comments on technical issues and concerns, (4) general comments, and (5) comments on maps and figures. Individual comments heard by team members or recorded on comment sheets are listed below according to comment theme. Verbatim comment sheets are attached.

Theme 1: Comments on This Public Meeting

- Many noted that the meeting had a really good turnout.
- Several people noted that the meeting was well organized and provided good information.
- Members of the media commented that the community seemed really engaged in the topics and conversations with the project team at the open-house stations.
- Many noted the absence of a question and answer period following the presentation. Not having this opportunity was perceived by some as a “tactic” for managing the group.

Theme 2: Comments on Overall Project Process and Communication

- Some attendees thought that DOT&PF had already defined the project; therefore, many residents wanted to know what was planned. Some said that if a project is underway it meant that those who allocated the funding had a definition of the project.
- Some residents voiced skepticism that DOT&PF really wanted to hear from them. There was a perception that the meeting was a "check the box" meeting rather than a genuine request for information.
- Some expressed that the DOT&PF’s concerns do not align with the community’s concerns (in general terms, this government agency doesn’t care about what happens to them as a community). Attendees wanted DOT&PF to understand “that the community has been through hell and back" [mentioning coal law suit, air quality issues, worry about economy] and that an adversarial relationship and unease developed on other projects impacts the airport project.
- Many voiced the need for honest communication and straight language. There was a request for the project team to understand that the community is filled with intelligent people who care about the community.

Theme 3: Comments on Technical Issues and Concerns
Comments on technical issues and concerns spanned topics like fencing, property ownership, hydrology, airport restrictions, the economy, and airport features. These comments are organized below by topic.

Fencing. Fencing is a sensitive issue. Many voiced not wanting or needing a fence. There is historical use by residents of the airport for non-aviation purposes. Residents see the airport as part of their community and cross the airport to get to the mud flats at the head of Resurrection Bay. One commented that the private property between the two runways was donated to Duck Unlimited. The area is used for hunting. Although this person acknowledged people walking across airport property to with a gun to go hunting wasn't necessarily compatible use it was a community use that is valued.

People also like having direct access to hangars. There was concern over reasons, location, and design/aesthetics of any new fencing.

DOT&PF's Rights as Property Owner. Meeting attendees do not understand DOT&PF's rights, responsibilities, and liabilities as the airport property owner.

- Many voiced frustration/anger at recent clearing of trees and brush.
- Many wanted advance notice of any activities on the airport, such as tree cutting and brush clearing, so they can become mentally and emotionally prepared for changes to their community.
- Many did not understand the reason or value of recent maintenance work involving tree cutting and brush clearing.

Hydrology of the Resurrection River and Request for Study. A common comment theme was the need to know more about the hydrology of Resurrection River related to airport flooding. Specifically, the following ideas and concerns were raised:

- **Dredging.** People know that river dredging occurred in the past and asked why this has not occurred regularly to fix the airport flooding problem. One attendee indicated this grandfather (many years ago) used to do river re-channeling annually to keep the river in the center of the flood plain. He indicated it was fishery issues that caused this practice to be discontinued.

  Some suggested dredging each year, particularly in the area "from the drop off to the deeps to the bridges on Nash Road and Seward Highway." One person suggested placing the dredged material behind the existing rip rap for future uses (such as harbor protection from flooding, runway expansion, and/or reestablishment of the original airport road or an eastside road). Some noted dredging happens in Anchorage and it should be acceptable in Seward.
- **Man-made changes** upstream that have caused the current airport flooding problem. People asked for information to understand the cause/effect relationship between

airport flooding and upstream work, particularly at "the (Seward Highway) Bridges." People want to understand the issue and identify some responsible party in order to determine (a) financial responsibility and (b) if a "man-made" problem makes it easier to receive environmental approval for changing the river alignment.

- **FIRM Map.** One attendee indicated the FIRM map is in the process of being updated. The FEMA had a meeting just days before our meeting to obtain public comment on the new map. This individual indicated he understood the ARRC was planning to go through the CLOMR process for their master plan improvements and he had suggested to them to wait to work from the new map. He suggested we work closely with the ARRC when doing our hydrology work.

Current Airport Weight Restrictions. Within this general comment theme, several points were raised.

- Many commenters focused on wanting the restrictions lifted immediately.
    - Some requested the project consider ways to have an "interim" repair if the restrictions cannot be lifted.
- Others focused comments on the importance of restrictions being lifted in the future since the restrictions negatively impact (a) Seward's economy and industry (see more, below) and (b) Seward's ability to keep residents and visitors safe***.*** Several commented that to be safe, residents and visitors need the airport to be able to accommodate emergency personnel and equipment.
- Many want clarity related to the engineering and safety issue of airplanes versus heavy equipment. The view is that if heavy equipment was used on the runway during the construction of the emergency dike, then a lightweight plane can be allowed. Some one-on-one conversations provided clarity and information (different physics, engineering, and safety parameters); however, this message was not widely distributed.
- Many asked for an update on DOT&PF's recent field review of this issue. The DOT&PF project manager communicated the results (no changes; restrictions will not be lifted during this project or prior to construction). This message was given when asked but not widely distributed.

Airport's Relationship to the Economy. City officials, lease lot holders, pilots, and media representatives commented that improvements are needed more quickly than 2018 or 2019. After seeing the required stages of the project, many asked DOT&PF and the project team to expedite the process. Commenters noted that an improved airport is very important to Seward's economic goals. There is a belief that without airport improvements Seward's planned economic development will be changed and businesses will pull out of Seward. There is an assumption that groups/businesses need an airport without the existing restrictions and that industry is waiting for these improvements.

Related to Airport Features. The meeting provided a good opportunity to speak with airport users. The following ideas and concerns were expressed verbally to team members or included on the comment sheets.

- Upgrade the runways/taxiways/ramp areas.
- Improve navigational aids to enhance safety:
    - WAAS (GPS Wide Area Augmentation System);
    - ADS-B (Aviation Dependent Surveillance-Broadcast) Tower
- Work to get better approach capabilities into SWD; one attendee, a longtime pilot of SWD who had previously had a commercial airtaxi service believes with the new technologies an approach is possible; he had developed one for his own use if needed in an emergency situation.
- Review the property maps; an attendee commented that the land shown on the property boundary on the north side of runway 13/31 doesn't appear correct; the Civil Air Patrol owns a strip of land along that side.
- Do NOT remove a runway because summer and winter winds necessitate two runways.
- Contradiction to the above, another attendee/pilot indicated that an extended Runway 16/34 would be adequate; it provides the needed wind coverage.
- Extend I-6 south for an instrument landing system (ILS) approach.
- Extend a short runway to establish "usable" ILS or GPS approach with a "missed approach" route up the valley; develop for this valley route a new published Non-Precision Instrument (NPI) approach.
- Have a long runway with an IFR approach and a short runway with a GPS approach straight in over the city.
- Do NOT raise taxiways because this would impact an existing hangar (raising the runway is okay).
- Remove the cross taxiway because it is seldom used, but this cross taxiway holds the water back.
- Add space for 20-30 more hangars.
- Build to the original airport plan, including a hangar large enough for large aircraft.
- Add water, fire hydrants, and sewer for safety.
- Construct a float pond (several comments) next to the long runway to bring Seward Airport up to par with other airports, like in Kenai.

Theme 4: General Comments

- Contact the military to get an accurate record of use of the airport by C-130s. A few years ago about 30 of these planes used the airport over a couple of weeks.
- Plan for the future: traffic will increase when the Coastal Village Fleet moves in, when a fixed-base operator has scheduled flights to Anchorage, and with Coast Guard traffic and medical flights.
- Make power more affordable; industry avoids Seward because of this high cost.

Theme 5: Comments on Maps and Figures

- The airport boundary on the “Airport Considerations/Issues” map is wrong—red boundary should be closer to the runway.
- In the future, don’t use red or green lines—these are hard to see and they carry a meaning just in their color (“stop” and “go”).
- The PowerPoint presentation: black letters on dark background and white letters on light background were hard to see. Purple font was hard to see.

###

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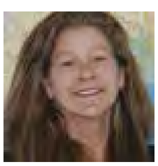

By Fern Greenbank
LOG Editor

Airport improvement process begins

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September 18, 2014 | Vol. 48, No. 57 | View PDF

The Alaska Department of Transportation got the ball rolling last week when it held an informational meeting in Seward about planned improvements for the Seward Airport.

On Thursday, Sept. 11, members of the team dealing with the airport improvements set up work stations with representatives from different areas of engineering and specialists to answer community questions. At least two dozen residents attended the info meeting, moving from one station to another with questions about different phases and aspects of the project.

One of those residents with a lot to lose is Denny Hamilton, owner of Seward Air, which has supplied fuel to small aircraft and large jets for more than two decades.

“I wasn’t impressed,” said Hamilton. “I think they have already made up their minds about what they’re going to do.”

Hamilton’s enthusiasm for the start of the airport improvement process is low because the DOT presentation reported that construction will not begin until 2018 with a likely completion date of 2020.

“I don’t know if I can hang on that long,” said Hamilton.

In her opening presentation, principal civil engineer for the project, Royce Conlon, said she knows people would like to be at the construction phase now, but the process is lengthy and layered.

“This is just the start of the process,” said Conlon. “We need input and feedback from the community before we ever get to a design stage.”

Conlon explained the multi-phased workflow which started with project identification. That was the easy part, she said, because it’s clear the Seward Airport is in trouble and needs help. In 2014, the runway experienced a lot of damage from flooding that is increasingly happening more often with the river re-routing itself over time and flowing across the runways.

In 2013, the weight limit for aircraft was reduced to 12,500 pounds, prohibiting large aircraft from landing. Since then, there have been several instances in which the Seward airport was needed either for Coast Guard related activities or medical emergencies, said Hamilton. The weight restriction has damaged Hamilton’s fuel business significantly and endangers lives that need the services large planes offer.

In light of the plans to develop the Seward Marine Industrial Center and expand the railroad operations, a functioning airport is necessary say all parties concerned. Engineer Joy Vaughn, on hand to answer questions at the DOT information meeting, said she isn’t aware of any group or individual that doesn’t want to see the airport restored to full capacity.

“Because the majority of the funding for airport projects come from the federal government,” said Vaughn, “we have to demonstrate a need and the federal government has very specific guidelines for documenting the need.”

Vaughn said she understands that people think the DOT has predetermined what kind of work is necessary and the call for public input is disingenuous, but she reitered throughout the meeting to multiple community members that the community outreach and public comment really does play a big role in determining the scope of the airport improvements which is then presented in the form of grant applications to the federal government.

The process explained at the information session went from scoping to environmental documentation to right of way issues to detailed design and then finally, construction. The DOT project team are trying to keep everything in balance, said Conlon. Trying to balance safety with community needs, natural environment and costs, is challenging, she said. But, she said at the center of the balancing act is public involvement.

Some members of the community made it known to engineers that because they had negative past experiences with the DOT and transparency, they were skeptical that they would be kept in the loop during the process.

“They went out there and cut down trees without telling anyone it was coming,” said Carol Griswald. “We would at least like to brace ourselves with some notice.”

Griswald wasn’t alone when it came to matters of trust. Shannon McCarthy, public information officer for the project, said large government agency projects often come with a mistrusting public and it’s their job to be transparent and earn the trust of residents affected by the project.

“This first meeting was about listening,” said McCarthy. “We have to listen and hear what people are thinking.”

As the process moves forward, said McCarthy, there will be more public outreach to make sure the agencies are not talking over residents of Seward.

Project Manager Barb Beaton said the website that will be up and running soon will be a great tool for the Department of Transportation.

“It will be an interactive site where people can make comments and ask questions,” said Beaton. “We really are interested in ideas from the people who live there, what they think about issues like wind and flooding and property issues.”

In addition to the website, McCarthy said another tool will be an advisory board made up of city officials, railroad officials and borough officials. That group will then report back to their respective groups, she said.

Two ideas have already been suggested by community members and Beaton said all suggestions will be discussed and considered. Several Seward residents, with decades of experience living near the airport, told DOT project officials how the Resurrection River had changed course slowly over time. The paving of roads and bridge construction upstream, they said, sped up the river’s migration closer and closer to the airport runway.

“If the Ballaine brothers came here right now to settle and build Seward here, they couldn’t,” said Kerry Martin, longtime Seward resident and former city officer. “In 1903 you could, but not now.”

Martin, referring to the increasing flooding experienced by Seward, said he agrees with others who think the least expensive method to salvage the airport runways over the long haul is to re-direct the river using gravel and excavation back to its former course.

Project Manager Beaton said the team has discussed this idea with several residents and she is not ruling it out as an option. The state has hired a hydrologist and his recommendation will be reported to the advisory board and residents for discussion.

“When we are comfortable and think the report is ready for public viewing, we will make it public,” said Beaton.

Hamilton, whose livelihood is on the line, said the timeframe is disheartening. He has suggested a solution that would allow the airport to operate at higher capacity while the Department of Transportation continues the studies required to receive federal funding.

Hamilton said he has spoken with the Federal Aviation Administration and was told the airport might qualify for a Prior Permission Required (PPR) process. Under the PPR program, larger planes could be allowed to land in Seward after they file for permission. Then, DOT engineers would arrive on site and study the runway as it relates to real time.

“I think they can be monitoring aircraft while they are dong their studies,” said Hamilton. This would allow planes over 12,500 pounds to land, and be serviced by companies like Hamiltons.

Project Manager Beaton said she has no knowledge of such a program because that type of issue falls under “operations” at the DOT. She said she would discuss it with the appropriate manager because she does not have the authority to authorize such a program.

Assistant City Manager Ron Long said he also was not aware of the PPR program administered by the FAA.

“I see no reason why that can’t be investigated as a possibility,” said Long. “The DOT is saying that it is open to ideas, and here is an idea.”

Long said the current “airport master plan” is not a binding document. It’s outdated and only useful as a tool for framing a discussion about transportation needs. The DOT and the city are not limited by the master plan, he said. When it comes to the idea of re-routing the river, Long said that so far, the DOT has not ruled that in or out.

“They have had ample opportunity to say yes or no,” said Long. “But I’m not sure if they have really considered that method.”

Because of the additional layers of regulations that apply to working with waterways, the idea may seem like more work and more money, said Long, but that shouldn’t be a deal breaker if re-routing the river is the best method for the situation.

With the runway flooding under scrutiny, said Long, it may be a great opportunity to look at new funding sources because other areas of Seward are threatened by increasing flooding.

The viability of the airport is important to the big picture, said Long. The Seward Marine Industrial Complex and the planned railroad dock expansion are forward thinking projects so it makes sense to envision an airport that will match that vision.

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Flooding isn't Seward Airport project's only concern

September 18, 2014 6:28 pm·1 commentViews: 280

Flooding occurs again over the Seward Airport runway, a year after it flooded before, and repairs were made to restore it to its former condition. Photo by Carol Griswold.

Heidi Zemach for SCN –

The little Seward Airport doesn't seem to get much public traffic. But some of the traffic it does get: Medevac aircraft collecting people with serious health emergencies, Coast Guard helicopters refueling during stopovers, or helicopters used to search and rescue missing boaters or hikers, can be vital to the town. When major flooding undermined the runway last September, and the Federal Aviation Administration shut down the airport runway to all but aircraft weighing under 12,500 pounds, medevac costs to a hospital ran to several thousand dollars. So it's not surprising that 33 residents turned out to attend an open house and Seward Airport Improvements Project presentation at the K.M. Rae Building September 11th, hosted by the Alaska Department of Transportation. They included pilots, public officials, people with businesses and property at, or near the airport, and those involved in flood issues.

Seward airport has experienced a number of floods in recent history, but last year's flood event in late October, in which the runway was overrun by water before a portion of it was physically undermined, swallowed up by the nearby creek turned raging stream, caught everyone's attention. Its subsequent closure until temporary repairs could be done impacted air travel and local access to emergency care for about four months. Recent runway flooding over the past week has clearly demonstrated that more needs to be done.

Flooding sits on top of the list of concerns that DOT feels need to be addressed by a new construction project yet to be determined- but several other key deficiencies with the airport have been identified that will also need to be considered, said Robin Reich, Public Involvement Coordinator with Solstice Alaska. The Seward Airport project picks up where a 2008 master plan identifying project needs left off, and it reevaluates those needs with respect to the recent flooding as well as changes in the Federal Aviation Administration's (FAA) design standards.

Some of the taxiways are considered "nonstandard" to FAA's current design requirements for instance, Reich said. The taxiway intersects the airport in what is considered a non-standard condition. Whether or not those conditions applies to the more rural Seward airport still needs to be evaluated based on the type of activity taking place at the airport, Reich said. Lighting is another concern, especially along the edges of the runway, and need to be repaired. The runway pavement condition is degraded due to old age and flooding. The short runway appears better aligned to wind conditions than the long runway is, and that situation also needs to be evaluated. Portions of the runway protection zone (area's at the ends of the runway such as the roads and railroad tracks) also are not desirable according to FAA guidance. Finally, there's a concern about safety due to trees that have grown up in the approach, and any project designed should address those concerns and ways to mitigate them.

The detailed planning process is expected to take up to four years, with actual construction of a project tentatively scheduled to begin in the spring of 2018 provided that there is adequate state and federal support and funding, Reich said.

The process currently is Scoping (information gathering), which continues through January 2015. That leads to Environmental Jan-December 2015. Then there's Right of Way Acquisition, Oct 2015-Feb 2017, followed by Airport Design and Construction, April 2018-October 2019.

Robin Reich, of Solstice America, shpoints to areas of concern DOT has with the Seward Airport.

The steps that will be undertaken before a decision about a future airport project is made includes reviewing aviation activity, wind coverage, wetlands issues, landownership and zoning, and future plans of the Alaska Railroad Corporation, its adjacent airport neighbor, said DOT Project Manager Royce Conlon. Experts also must review new aerial photos highlighting the latest flood hydrology and known airport deficiencies. They also will review federal floodplain mapping, along with newer maps to better understand why flooding is occurring. There will need to be hydrology studies, and also a detailed Environmental Assessment of whatever project is planned. The EA would take into account how the project would affect the natural and human environments, whether there are any endangered species, affected fisheries or fish habitat, and how to mitigate any impacts. The public can become involved and stay informed via newsletters and a project website. There will be more meetings, open houses, and public hearings during the review period for the EA. A stakeholder advisory group, made up of interested locals also is being formed to assist in the process.

Asked whether DOT plans to completely reconfigure the flow of the stream adjacent to the runway, which many view as an impossible task as water tends to flow wherever it wants to go, Reich would only say that it's too early to tell at this point. There is no plan, she emphasized. That's why all the scoping, the studying, and planning process needs to occur.

For more information, visit the project on the web.

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Author: Heidi Zemach Heidi Zemach is a staff writer for Seward City News.

One Comment

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Emerald Hagy

From: Olivia Cohn <olivia@solsticeak.com>
Sent: Friday, April 8, 2016 2:33 PM
To: 'Jackie Wilde'
Cc: 'Carla SlatonBarker'
Subject: 4/20 Seward Airport Improvements Public Open House Meeting
Attachments: Seward Airport Project Public Meeting 4_20_2016.pdf

Hello Jackie:

Thank you so much for agreeing to distribute the meeting announcement for the April 20th Seward Airport Improvements Project public open house meeting. The announcement text is below, and a PDF of the announcement is attached. Thanks, also, for agreeing to hang the flyer in your office and other locations in the community. If you wouldn't mind letting us know where the announcement is distributed for our records, that would be wonderful.

I have copied my colleague, Carla SlatonBarker, on this email. Next week, I will be traveling in the Lower 48, and Carla is a great point of contact on this project in case you can't reach me.

Thank you for all of your advice.
Olivia

Olivia Cohn
Environmental Planner
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Seward Airport Improvements Project
Project # Z548570000

Public Open House Meeting

The Alaska Department of Transportation and Public Facilities (DOT&PF), with the Federal Aviation Administration (FAA), has undertaken a project to improve the Seward Airport. The purpose of the **Seward Airport Improvements Project** is to reduce the damage the airport is experiencing from recurrent flooding and to correct airport deficiencies based on the airport's forecasted function and FAA design standards.

Public Open House Meeting
Date: Wednesday, April 20, 2016
Hours: 5:00 pm to 7:30 pm (stop by any time)
Location: K.M. Rae Marine Education Building
Address: 125 Third Avenue, Seward, Alaska

Please stop by any time during the open-house hours to:

- Learn about the project's top challenges: Resurrection River hydrology, aviation demand, and funding.

- Learn about existing and forecast airport activity, project alternatives, and each alternative's advantages and disadvantages.
- Provide comments on the alternatives.
- Learn about the project's timeline and next steps.

Written comment may be given at the Open House or submitted via the website (www.dot.state.ak.us/creg/sewardairport/), via email to solsticeak@solsticeak.com, or via mail to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, 2607 Fairbanks Street, Suite B, Anchorage, AK 99503 **by May 13, 2016**. For more information or to join the mailing list, visit www.dot.state.ak.us/creg/sewardairport/.

Seward Airport Improvement Project
Project # Z548570000

Public Open House Meeting

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The DOT&PF complies with Title II of the Americans with Disabilities Act of 1990. Individuals with a hearing impairment can contact DOT&PF at a Telephone Device for the Deaf (TDD) at (907) 269-0473. No person shall be excluded from participation in, or be denied benefits of any DOT&PF program based on race, religion, color, gender, age, marital status, ability, or national origin.

Seward Airport Improvements Project
(Project #Z548570000)

A project to reduce the damage the airport is experiencing from recurrent flooding and to correct airport deficiencies based on the airport's forecasted function and Federal Aviation Administration design standards.

Visit the Project Website:
www.dot.state.ak.us/creg/sewardairport

Attend the upcoming Public Meeting:
see details, other side

DOT&PF operates Federal Programs without regard to race, color, national origin, sex, age, or disability. The full Title VI Nondiscrimination Policy Statement can be found at http://dot.alaska.gov/tvi_statement.shtml.

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Seward Airport Improvements Project
Project #Z548570000

The Alaska Department of Transportation and Public Facilities (DOT&PF), in association with the Federal Aviation Administration (FAA), is proposing to improve the airport in Seward, Alaska. The purpose of the **Seward Airport Improvements Project** is to reduce the damage the airport is experiencing from recurrent flooding and to correct airport deficiencies based on the airport's forecasted function and FAA design standards.

Using input provided during the last public meeting, the project team has developed project alternatives to solve identified issues and needs. The project team invites you to attend a **public meeting** (see right) to:

- Learn about the project's top challenges: Resurrection River hydrology, aviation demand, and funding.
- Learn about existing and forecast airport activity, project alternatives, and each alternative's advantages and disadvantages.
- Provide comments on the alternatives.
- Learn about the project's timeline and next steps.

Public Meeting

We hope you can attend!

WHAT: **OPEN HOUSE PUBLIC MEETING**
April 20, 2016, 5:00 pm to 7:30 pm

It's an Open House, so **STOP BY any time** between 5:00 pm and 7:30 pm

WHERE: **K.M. Rae Marine Education Building**
125 Third Avenue, Seward

Public Comment

The DOT&PF is looking for public comment. Visit the project website, attend the public meeting, or send written comment by ***May 13, 2016*** to:

Robin Reich, Public Involvement Coordinator
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, Alaska 99503
solsticeak@solsticeak.com

Visit the Project Website at:
www.dot.state.ak.us/creg/sewardairport

Meeting Agenda and Overview

Meeting Purpose

- Provide an overview of the Seward Airport Improvements Project (needs and challenges that the project will address, work that has occurred to date, upcoming steps).
- Present the results of key studies: Hydrology Report and Aviation Activity and Facility Requirements Report.
- Present alternatives developed to solve identified issues and needs.
- Present the advantages and disadvantages associated with each alternative.
- Gather input from community members.

Meeting Format

- **Open House Hours:** 5:00 pm to 7:30 pm
  - Please sign in and then visit the information stations (see detail below) in this lobby.

Open House Stations

- **Station #1: Welcome and Sign in**
- **Station #2: Understanding the Challenges**
  - Learn about the top three challenges that form the backdrop for the Seward Airport Improvements Project:
    - Resurrection River Hydrology
    - Airport Demand
    - Funding
- **Station #3: Understanding the Possible Solutions**
  - Learn about the range of alternatives considered to date, including three viable alternatives, and advantages and disadvantages of each.
  - Share your thoughts on alternatives.
  - Learn about the project's next steps.
- **Station #4: Comment Station**
  - Your written comment is an important part of the process. You'll find comment forms here.

Thank you for your time and participation!

Seward Airport Improvements Project

Public Meeting #2 • Open House • April 20, 2016

Thank you for your attendance today. Please sign in (legible print is appreciated)!

Voluntary Information Requested by the Civil Rights Office of the Alaska Department of Transportation and Public Facilities *

Gender (Circle) Race (Circle)

Name	Mailing Address	Email Address	Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
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Al Schafer	Box 610	Seward.	Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
Christy Terry	PO Box 588	Swd	Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
E. Bentler	PO Box 624		Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
Sue McClure	Box 3686 Seward		Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
Michael D. Irving	PO Box 285 Seward	girdwoodcowboy@yahoo	Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
Denny Hamilton	PO #7 Sew		Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
Emily Johnson	P.O. Box 1187		Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
Richard Hocking (Hocking)	PO Box 391	RichardHocking@ alaska.net	Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other

* The purpose of requesting this information is to ensure fair and equal representation by the public in all projects and programs administered by the Alaska Department of Transportation and Public Facilities.

Seward Airport Improvements Project

Public Meeting #2 • Open House • April 20, 2016

Thank you for your attendance today. Please sign in (legible print is appreciated)!

AEES
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Carol Griswold	Bx 1342	c_griz@yahoo.com	Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
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Mike Insalaco	PO Box 3505	mike@ak.net	Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
Ronn Hemstock	Box 2976	~~[illegible]~~.org ronn@kpbsd.org	Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other

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Seward Airport Improvements Project

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Gender (Circle) Race (Circle)

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TASHA DIMARZIO	PO BOX 2676 SEWARD, AK 99664	tjbluebird@yahoo.com	Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
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			Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
			Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
			Male/Female	White/Alaska Native/Native American/ Black/Hispanic/Asian/Pacific Islander/Other
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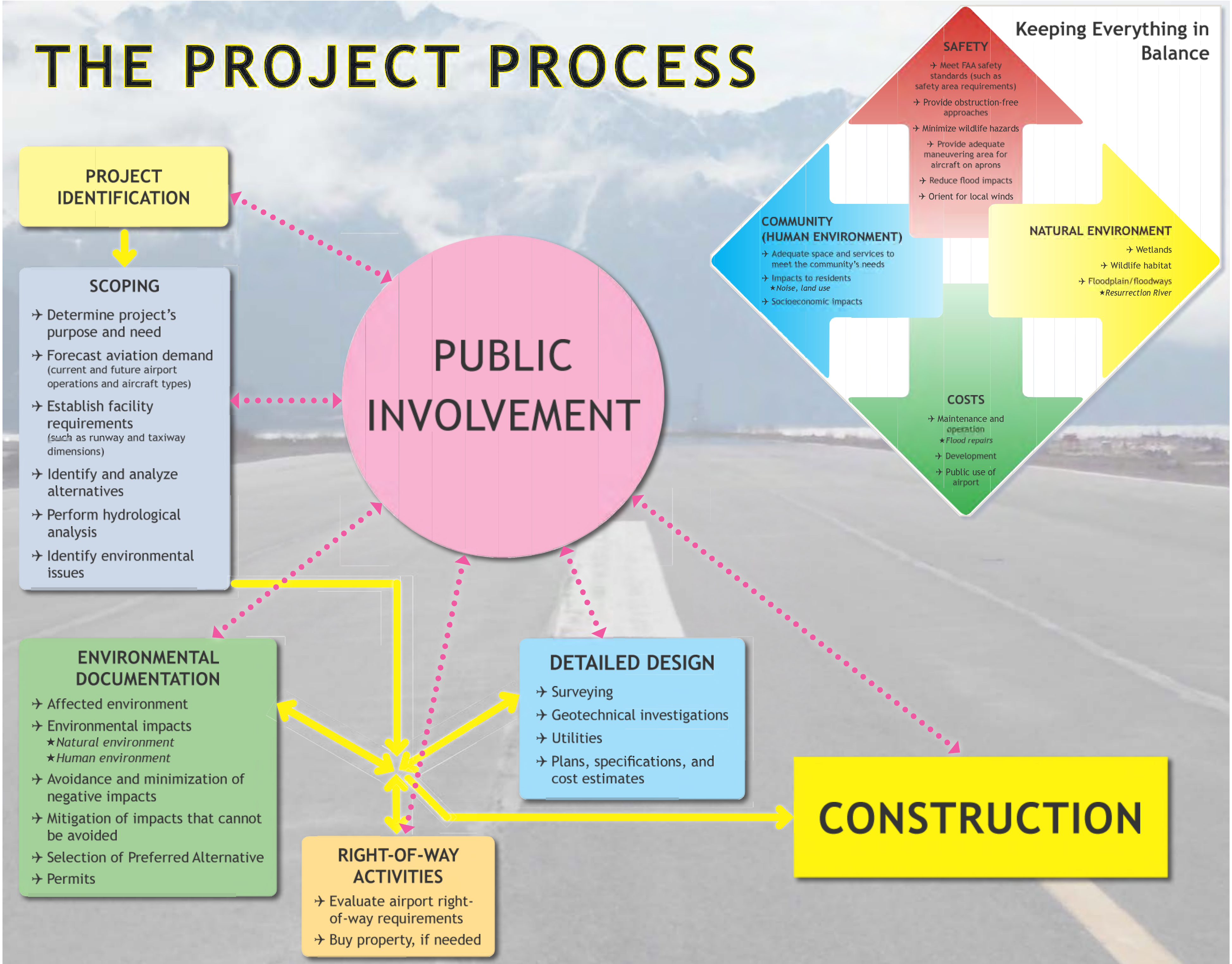

THE PROJECT PROCESS
PROJECT IDENTIFICATION
SCOPING
Determine project's purpose and need
Forecast aviation demand (current and future airport operations and aircraft types)
Establish facility requirements (such as runway and taxiway dimensions)
Identify and analyze alternatives
Perform hydrological analysis
Identify environmental issues
PUBLIC INVOLVEMENT
ENVIRONMENTAL DOCUMENTATION
Affected environment
Environmental impacts
★Natural environment
★Human environment
Avoidance and minimization of negative impacts
Mitigation of impacts that cannot be avoided
Selection of Preferred Alternative
Permits
RIGHT-OF-WAY ACTIVITIES
Evaluate airport right-of-way requirements
Buy property, if needed
DETAILED DESIGN
Surveying
Geotechnical investigations
Utilities
Plans, specifications, and cost estimates
CONSTRUCTION
Keeping Everything in Balance
SAFETY
Meet FAA safety standards (such as safety area requirements)
Provide obstruction-free approaches
Minimize wildlife hazards
Provide adequate maneuvering area for aircraft on aprons
Reduce flood impacts
Orient for local winds
COMMUNITY (HUMAN ENVIRONMENT)
Adequate space and services to meet the community's needs
Impacts to residents
★Noise, land use
Socioeconomic impacts
NATURAL ENVIRONMENT
Wetlands
Wildlife habitat
Floodplain/floodways
★Resurrection River
COSTS
Maintenance and operation
★Flood repairs
Development
Public use of airport

Schedule & Process

*The schedule is dependent upon a number of variables and will likely change

Scoping

Environmental
At least 1 year

Right of Way Acquisition
Up to 2 years

Airport Design

Preliminary	Local	Plans in Hand	Review PS&E	Final PS&E
	35%	65%	95%	100%

Construction
2018 or later
depending on duration of prior phases

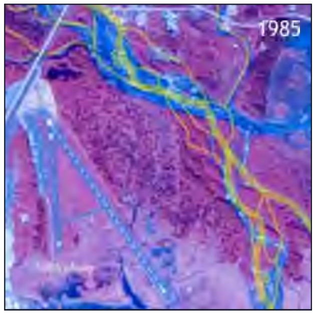
Public Involvement

Challenge: HYDROLOGY

River flooding has caused:

- Extensive erosion that compromises the runway's pavement structure. As floodwaters recede, fines (the binding material or "glue") in the base materials are washed out, leaving voids between the large rocks under the pavement.
- Reduction of pavement strength, resulting in weight restrictions being placed on the main runway.

Why is River Hydrology an Engineering Challenge?



Solutions to river flooding must be cost-effective, long-lasting, and compliant with the requirements to secure environmental permits — a tough set of requirements considering:

River "Flood Zone"

- As you can see from the photos above, the Resurrection River isn't just near the airport—the main runway is located within the river's floodway. No engineering solution can permanently change the fact that the runway and the river compete for the same real estate.

River Type — On the Move and Hard to Control

- The Resurrection River is a braided river, meaning that it constantly moves from channel to channel within the floodplain—as the photos above show. Where any braided river will move over time is always a guess, but this is particularly true for the Resurrection River, which carries a lot of natural sediment (gradually clogging existing channels as it settles out) and meltwater (carving new channels during peak seasonal flows). Attempts to control braided rivers provide only short-term benefits, or else require constant maintenance and demand continual funding.

The Resurrection River has caused recurring damage to Seward Airport.

In 2013 alone, the river overtopped the runway 10 times.

Ways to Address the Challenging Hydrology

Raise, Armor, and Reconstruct Runway 13-31	The project will explore ways to better **protect Runway 13-31** (the existing main runway) from flooding by raising the elevation, adding armor protection, and then reconstructing the runway.	See Alternative 1.1 at Station 3
Close Runway 13-31 and Improve Runway 16-34 Instead	The project will explore ways to **improve Runway 16-34** (the existing crosswind runway) in terms of length, width, elevation, and flood protection/armoring. This idea explores closing the main runway to allow floodwater better access to the existing floodplain.	See Alternative 2.2 and Alternative 3.0 at Station 3
Reroute and/or Dredge the Resurrection River	Rerouting the river via dredging or other in-stream options **is not viable.** These types of solutions require continual maintenance, funding, and permitting. Neither a dedicated funding source nor staff to manage the effort are available from DOT&PF.	Not an option

Seward Airport Today

✈ Runway 13-31 (main runway) 4,249 feet x 100 feet

✈ Runway 16-34 (crosswind runway) 2,289 feet x 75 feet

The project will focus on solutions to meet **near-term needs** of the current based aircraft PLUS medevac aircraft (King Air B200).

- A minimum runway length of **3,300 feet** will serve the existing based aircraft and medevac operations. (See the highlighted "Current Demand & Medevac" column in the table at right for the other minimum dimensions.)

The project will continue to consider a longer, 4,000-foot runway as a future growth scenario to accommodate the potential demand for commuter aircraft such as the Beech 1900 or the Dash-8.

- See the "Growth Scenario & Emergency Preparedness" column in the table at right for other minimum dimensions.

Challenge: AVIATION DEMAND

Ways to Address the Aviation Demand Challenges

Required Runway Dimensional Standards

(highlighted column notes dimensions to meet aviation demand at Seward Airport)

Feature	Current Based Aircraft Group	Current Demand & Medevac (King Air B200) *Recommended for Near-Term Development*	Growth Scenario & Emergency Preparedness (Beech 1900) *Consider for Long-Term Development*	Dimensions of Existing Main Runway (13-31)
Aircraft Approach Category	A	B	B	B
Aircraft Design Group	I	II	II	II
Runway Length	3,300 feet	3,300 feet	4,000/4,700 feet	4,249 feet
Runway Width	60 feet	75 feet	75 feet	100 feet
Visibility Minimums	1 mile	1 mile	1 mile	1 mile
Crosswind Component	10.5 knots	13 knots	16 knots	13 knots
Runway Safety Area	120 ft x 3,780 ft	150 ft x 3,900 ft	150 ft x 5,300 ft	150 ft x 4,749 ft
Object Free Area	400 ft x 3,780 ft	500 ft x 3,900 ft	500 ft x 5,300 ft	500 ft x 4,749 ft
Runway Protection Zone	1,000 ft x 500 ft x 700 ft	1,000 ft x 500 ft x 700 ft	1,700 ft x 500 ft x 1,010 ft	1,000 ft x 500 ft x 700 ft
Part 77 Primary Surface	500 ft x 3,700 ft	500 ft x 3,700 ft	500 ft x 5,100 ft	500 ft x 4,649 ft
Part 77 Approach Slope	20:1 (visual)	20:1 (visual)	20:1 (visual)	20:1 (visual)

Station #3 shows these dimensional standards as Alternatives.

Alternative 2.2 is the alternative recommended for near-term development. It meets FAA criteria for improvements to meet expected aviation demand.

FAA will support development of the airport to meet Aircraft Approach Category B and Aircraft Design Group II (B-II), which is 3,300 feet long by 75 feet wide, with visual approach capabilities. This standard is consistent with the 2008 Airport Master Plan and approved Airport Layout Plan.

Challenge: AVIATION DEMAND

A facility as large as the existing airport isn't needed to accommodate the expected future aviation activity.

That means funding improvements that rebuild the airport to the existing size may not be possible or practical.

Why is Aviation Demand an Engineering Challenge?

Sometimes what we ***want*** to design/fund differs from what we ***can*** design/fund. Improvement funding is determined by aviation demand. Specific challenges related to aviation demand in Seward include:

The number of operations (landings + takeoffs) at Seward Airport is **low** when compared to other airports statewide.

- The Seward Airport forecast estimates the number of operations will grow as shown below.

Operations	Base Year: 2013	+5 Years		+10 Years		+15 Years	
Local GA	2,000	2,127	2,208	2,260	2,438	2,402	2,693
Itinerant GA	4,000	4,252	4,417	4,520	4,877	4,805	5,387
Medevac	200	213	220	228	243	243	268
Air Taxi/Charter	4,500	4,713	4,969	5,085	5,485	5,406	6,056
TOTALS	10,700	11,375	11,814	12,093	13,043	12,856	14,404

Reference: Seward Airport Improvements, Revised DRAFT Aviation Activity & Facility Requirements, July 13, 2015.

- The number of operations is also low when compared to similar airports.

Airport	Annual Operations (2013)
Seward Airport (SWD)	10,700
Kenai Airport (ENA)	38,950
Homer Airport (HOM)	48,085
Dillingham Airport (DLG)	50,823

Aircraft using the airport now and in the future determine improvements.

- FAA can't fund "build it and they will come" improvements. Engineers must design improvements to serve the existing and forecast aircraft fleet mix based on the design aircraft. Below is the historical fleet mix.

Operator	Aircraft	Airport Approach Category	Airport Design Group	Use
LifeMed	King Air B200	B	II	Medevac
LifeFlight	King Air B200	B	II	Medevac
Guardian	King Air B200	B	II	Medevac
Scenic Mountain Air	Cessna 172	A	I	Flightseeing / air taxi
Seward Air	Super Cub PA-18	A	I	Personal
Private	Cessna 172 Super Cub PA-18	A	I	Personal
Private	Cessna 170	A	I	Personal
Grant Aviation	King Air B200	B	II	Air taxi / charter
Homer Air	Cessna C206/207/209/210 Stationair	A	I	Air taxi / charter
Smokey Bay Air	Cessna C206/207/209/210 Stationair	A	I	Air taxi / charter
Iliamna Air Taxi	Pilatus PC-12	A	II	Air taxi / charter
Island Air Service	Cherokee 6	A	I	Air taxi / charter
Alaska Central Express	Beech 1900	B	II	Air taxi / charter
ERA Aviation	Beech 1900	B	II	Air taxi / charter
Frontier Flying Service	Beech 1900	B	II	Air taxi / charter
Warbelows	Cessna 172	A	I	Air taxi / charter
Wright Air Service	Cessna 208 Caravan	A	II	Air taxi / charter
Other: Operators who requested permission to land in 2013	Lear 35 (11 requests) Gulfstream 5 (16 requests) DC-6	C C B	I III III	
Other: U.S. Coast Guard search and rescue activities and exercises	C-130	C	IV	

Reference: Seward Airport Improvements, Revised DRAFT Aviation Activity & Facility Requirements, July 13, 2015. Data from 2007-2013.

Additional Challenges

FAA design guidance requires the selection of a design aircraft, based on operations, to determine the size of facility that can be funded.

- **The design aircraft is the most demanding aircraft** (or family of aircraft) that REGULARLY uses the airport (now or in the future). The size of this aircraft sets the airport's length, width, and other dimensions.
- "Regular use" is defined as 500 operations (landings + takeoffs) per year.
- The most demanding aircraft (largest wingspan and longest runway length needed) currently using Seward Airport is the **King Air B200**, which is used for medical evacuations. While the annual operations of the medevac airport alone don't meet the FAA threshold of 500, the B200 is a part of the "family" of B-II aircraft serving Seward, which taken together do meet the threshold.
- Larger aircraft such as the C-130 and small charter jets do not fly into or out of Seward Airport often enough to meet the FAA's threshold of **regular** use.
- FAA does not fund public airports to support military operations or aircraft.

"Need to Know" Concepts

Aircraft Approach Category is a letter code (A to E) that classifies aircraft based on the speed at which the aircraft approaches a runway for landing. Category A aircraft approach at a slower speed than Category E aircraft; the higher the approach speed, the longer the runway needed.

Aircraft Design Group is a numerical code (I to VI) that groups aircraft by wingspan size. Group I has the smallest wingspan range, while Group VI aircraft has the widest wingspan range. The wider the wingspan range, the wider the runway needed.

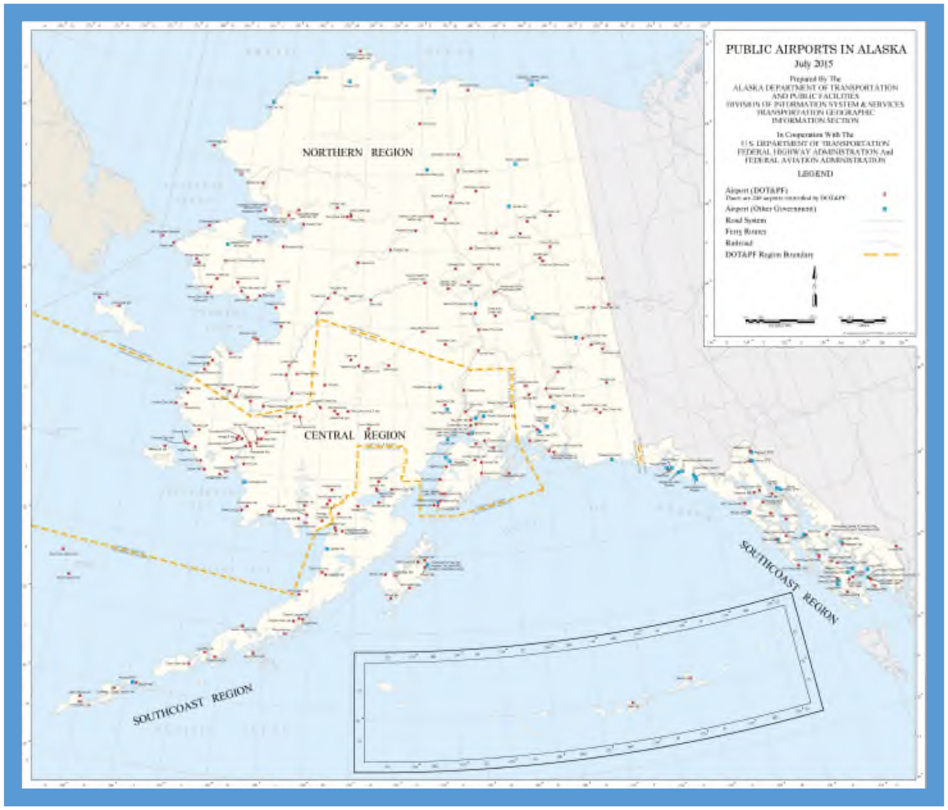
Challenge: FUNDING

> “Since 2007, economic pressures—including high fuel prices, the financial crisis, and the ensuing recession of 2007-2009—contributed to airline restructuring...general aviation activity, which includes all forms of aviation except commercial and military, has also declined over the last decade. **Because many sources of airport funding, including federal support and locally generated revenue, are tied to aviation activity, for many airports these trends mean less funding available** for infrastructure development.”
>
> Statement of Gerald L. Dillingham, Ph.D., Director, Physical Infrastructure Issues
> *Highlights of GAO-14-658T, a testimony before the Subcommittee on Aviation, Committee on Transportation & Infrastructure,House of Representatives*

Challenge Number One

The FAA Airport Improvement Program (AIP) funding is based on a **competitive** scoring system. To receive funding, a project must score well. For the Seward Airport this is a challenge because of:

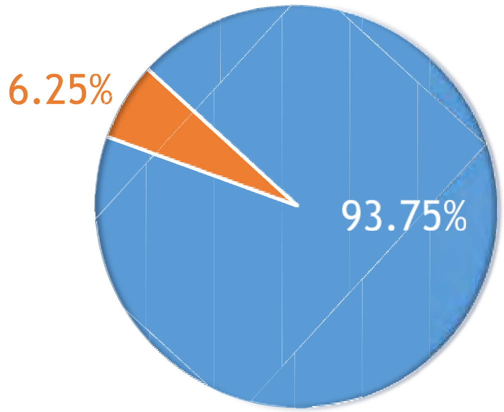
- The Competition!—Alaska has 249 state-owned airports and 20 municipally owned airports, all seeking funding. Many of these airports are the only means of year-round transportation of people, clothing, food, and fuel for their respective communities.
- Alternative Access—Airports with alternative access such as roads, railroads, and marine vessels do not score as high.
- No other funding source is readily available to DOT&PF. State funding through other sources is not likely in the near term due to Alaska’s current fiscal crisis.
- Combining funding sources, although not impossible, proves to be difficult due to timing and commitments of other agencies.



Sources of Funding

Primary: *FAA Airport Improvement Program*

Secondary: *State of Alaska funds*



...And More Challenges...

- The AIP program has about $213 million to spend each year, and this is typically spread over 10 to 15 projects per year.
- The current estimate for the Seward Airport Improvements Project is about $20 million (about 10% of the AIP annual budget).
- Federal/state dollars continue to shrink, while the cost of construction increases.
- Due to budget cuts, future funding is not secure.

Understanding Possible Solutions

Initial Alternatives and Refinement Process

What we've done so far:

01

Collected background data

• • •

Conducted field visit and talked with airport users

• • •

Met with the public

02

Began aviation demand study

• • •

Met with SWG (Seward Airport Working Group: City, Borough, and pilots)

• • •

Completed aviation demand study

• • •

Developed 5 options using current and future use scenarios

• • •

Met with SWG

03

Expanded number of options under consideration to 8 (variations of the initial 5)

• • •

Initiated a hydrologic study

04

Refined alternatives and eliminated some options based on initial hydrologic study results

• • •

Reviewed impacts to adjacent properties and to the environment

05

Completed hydrologic study based on the alternatives most viable for future consideration

• • •

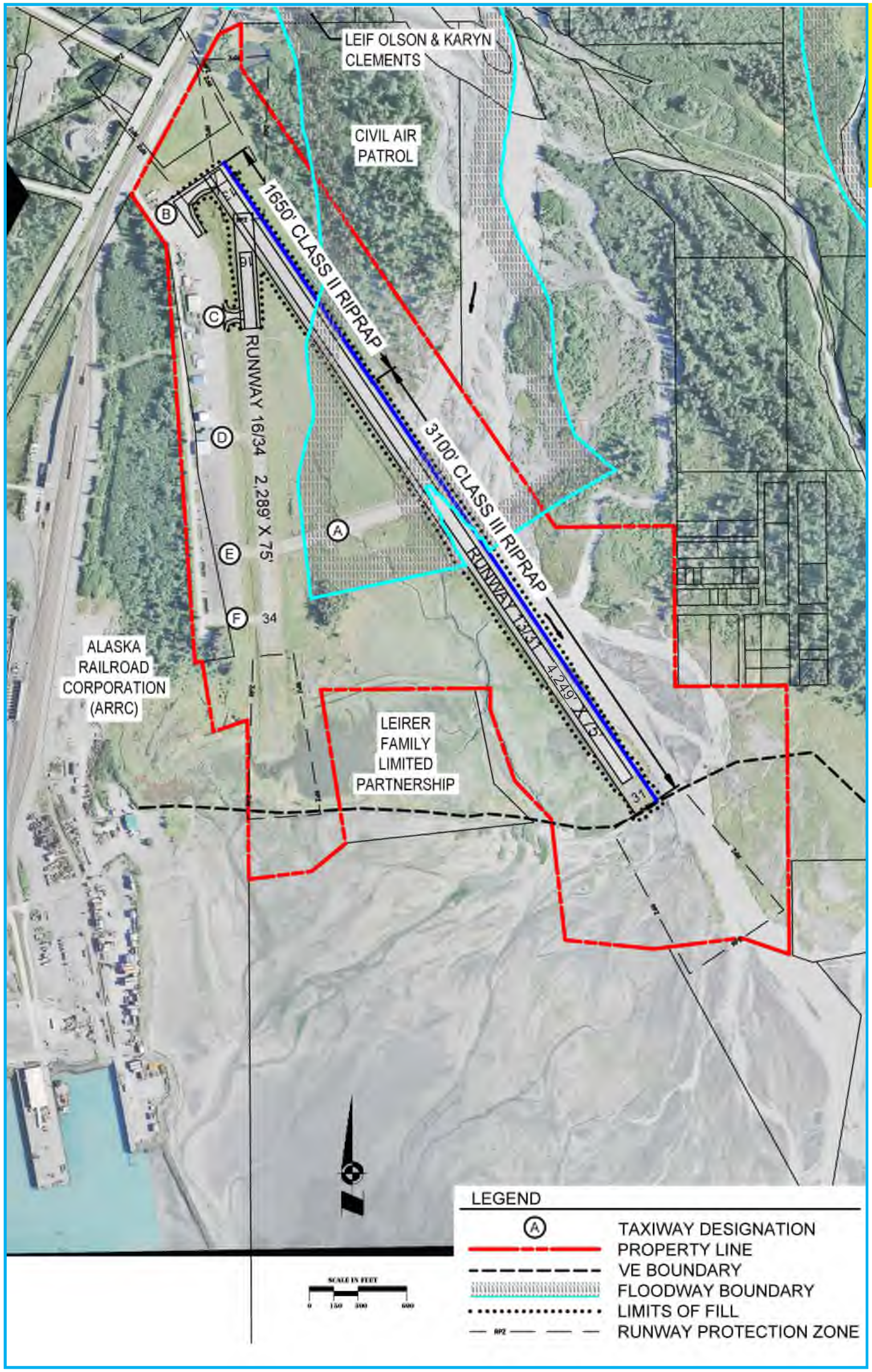
Present challenges and 3 possible solutions

★ WE ARE HERE ★

Today we want to:

Show you the results of this work—our three final alternatives.

Gain additional input on the advantages and disadvantages of these three alternatives.



ALTERNATIVE 1.1

Reconstruct Existing Main Runway (13-31) (4,249 feet x 75 feet)

- Reconstruct and raise Runway 13-31 above the 100-year flood level. Install riprap to protect the embankment.
- Adjust elevations of Runway 16-34 and Taxiways B and C to match new runway elevation. Eliminate Taxiways A, D, and E to comply with new FAA guidance.

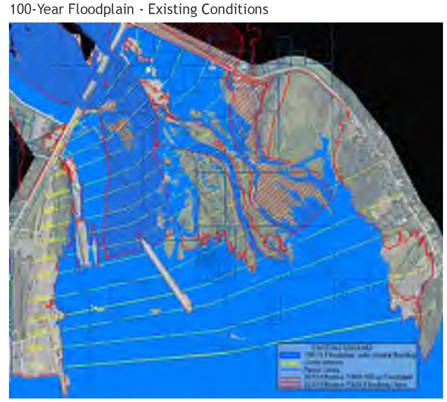
Key Advantage

+ Runway will still accommodate historical jet traffic, although it will be slightly shorter to provide the full required Runway Safety Area.

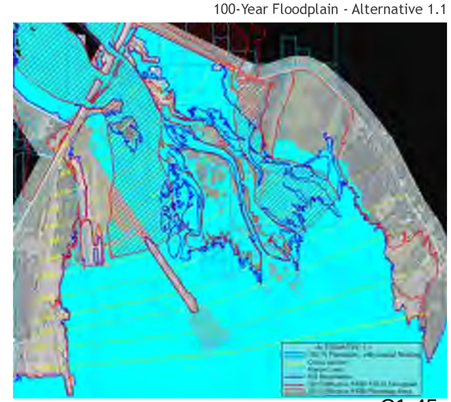
Key Disadvantages

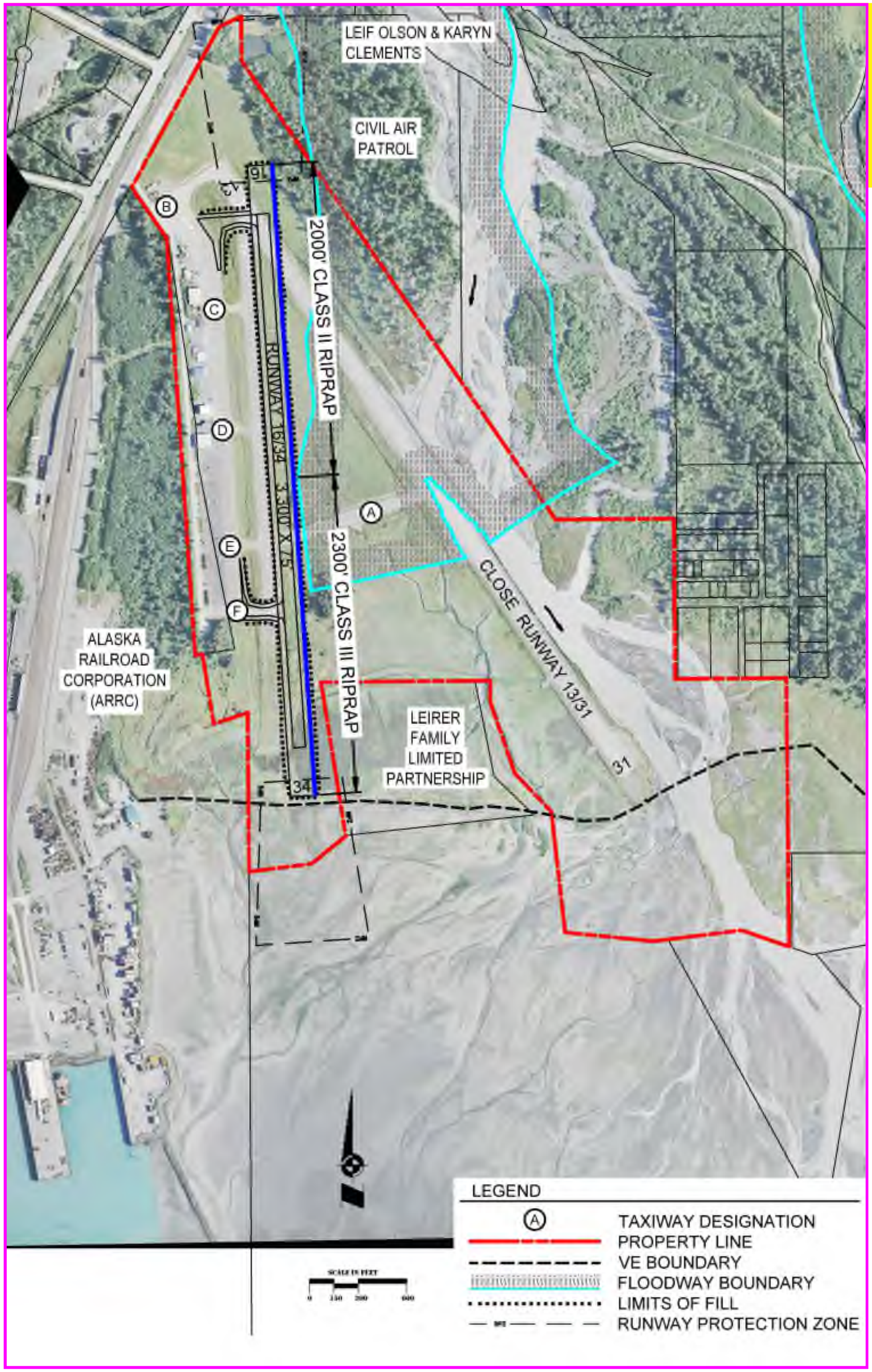
- Creates the greatest flood impacts.
  - Requires armoring and raising the runway by 4 feet on average.
  - The higher runway will redirect more flood water further to the other side of the river, impacting more properties than the other alternatives, thereby lengthening the property acquisition phase.
  - Impacts the Resurrection River floodway, requiring a revision of the FIRM (flood) map. May not be achievable due to the additional impacts to river properties. Requires a public process. The FIRM revision is expected to lengthen the permitting process by about 2 years.
- Most difficult option to permit and construct due to the work required in the river.
- Offset from the apron remains substandard for large aircraft.

100-Year Floodplain - Existing Conditions



100-Year Floodplain - Alternative 1.1





ALTERNATIVE 2.2

Shift Existing Crosswind Runway (16-34) East & Add 1,011 Feet (3,300 feet x 75 feet)

- Close Runway 13-31 and allow floodwater to overtop it.
- Reconstruct and raise Runway 16-34 above the 100-year flood level. Install riprap to protect the embankment.
- Relocate Taxiway B and adjust Taxiway F to match new runway elevation. Eliminate Taxiways A, C, D, and E to comply with new FAA guidance.

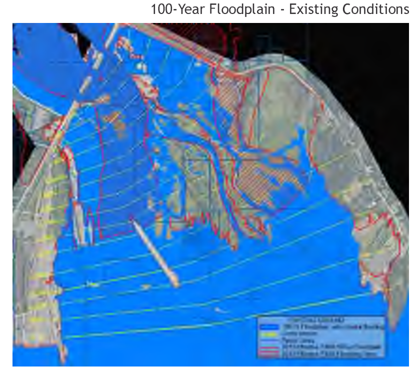
Key Advantages

+ Sufficient for current and predicted aircraft demand. Accommodates the design aircraft.
+ Less susceptible to flood damage than Alternative 1.1, since improvements are located further away from the river threat.
+ Lengthens the runway that is best aligned with the predominant wind direction.
+ Increases the runway offset from the apron to allow larger aircraft to use the apron.
+ Has the least environmental and flood impacts of all alternatives. Impacts the floodplain but not the floodway.
+ Raises the 100-year flood level by less than 1 foot, resulting in minor additional flood impacts to river properties. Fewer properties to be acquired than Alternative 1.1, and consequently, a shorter property acquisition process.
+ Could be phased to extend to a longer runway as future demand warrants.
+ Easiest option to construct.

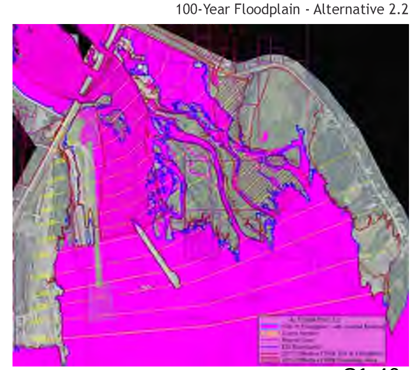
Key Disadvantages

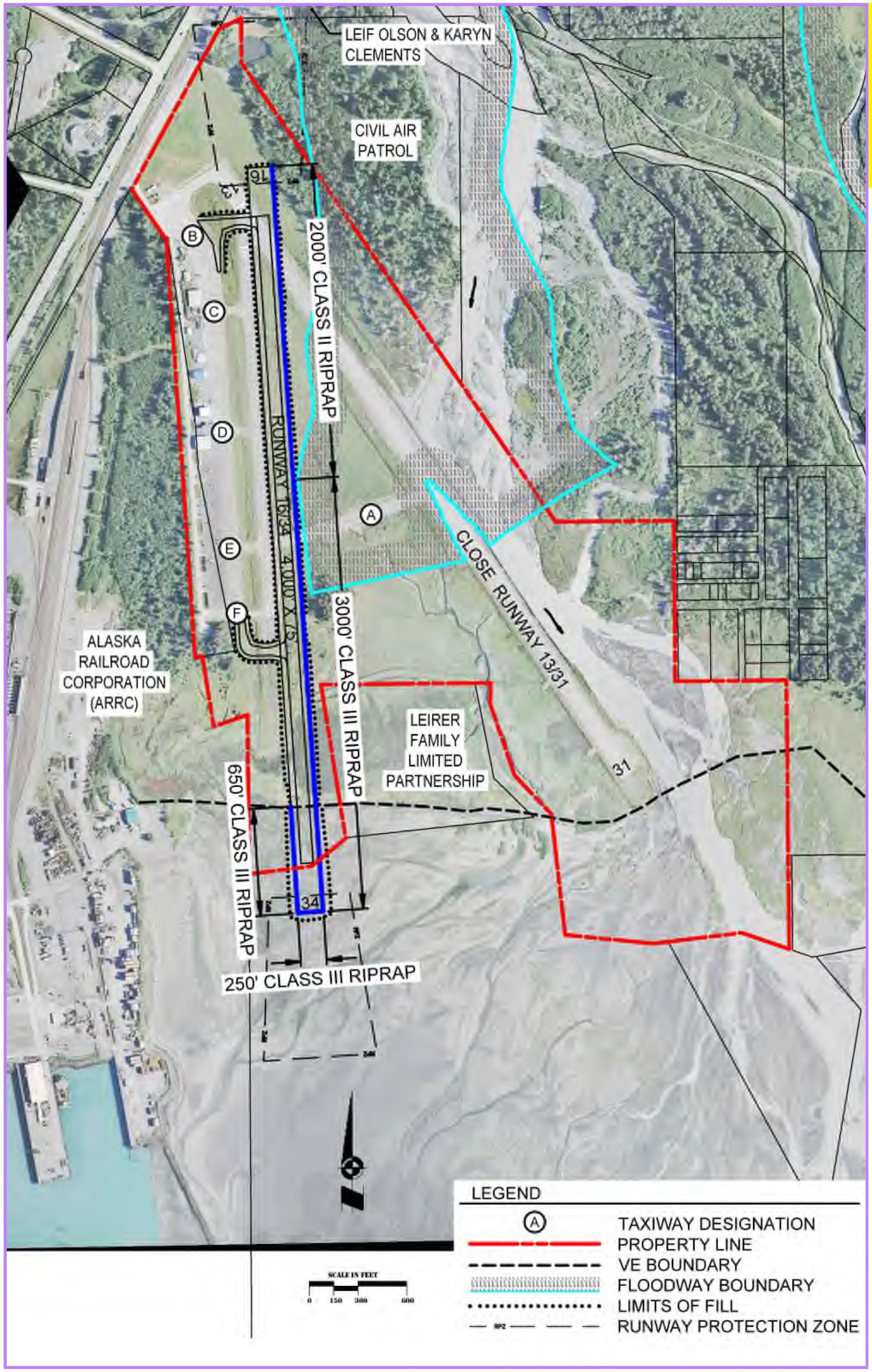
- One runway (13-31) would be eliminated.
- The new, improved Runway 16-34 would be 949 feet shorter than the abandoned runway.

100-Year Floodplain - Existing Conditions



100-Year Floodplain - Alternative 2.2





ALTERNATIVE 3.0

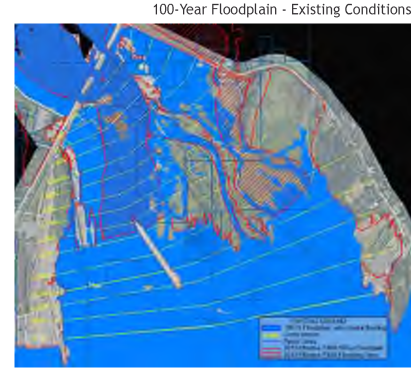
Shift Existing Crosswind Runway 16-34 East & Extend by 1,711 Feet (4,000 feet x 75 feet)

- Close Runway 13-31 and allow floodwater to overtop it
- Reconstruct and raise Runway 16-34 above the 100-year flood level. Install riprap to protect the embankment.
- Relocate Taxiway B and adjust Taxiway F to match new runway elevation. Eliminate Taxiways A, C, D, and E to comply with new FAA guidance.

Key Advantages

+ Less susceptible to flood damage than Alternative 1.1, since improvements are located further away from the river threat.
+ Is longer than Alternative 2.2, which allows for use by commuter aircraft such as the Dash-8.
+ Lengthens the runway that is best aligned with the predominant wind direction.
+ Increases the runway offset from the apron to allow larger aircraft to use the apron.
+ Raises the 100-year flood level by less than 1 foot, resulting in minor additional flood impacts to river properties. Fewer properties to be acquired than Alternative 1.1, and consequently, a shorter property acquisition process.

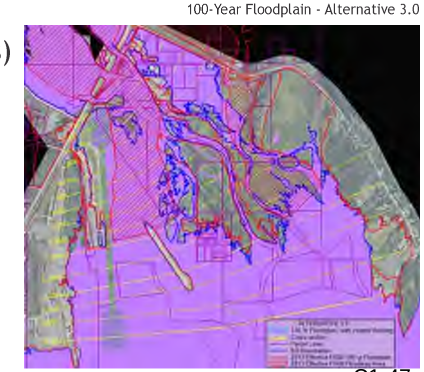
100-Year Floodplain - Existing Conditions



Key Disadvantages

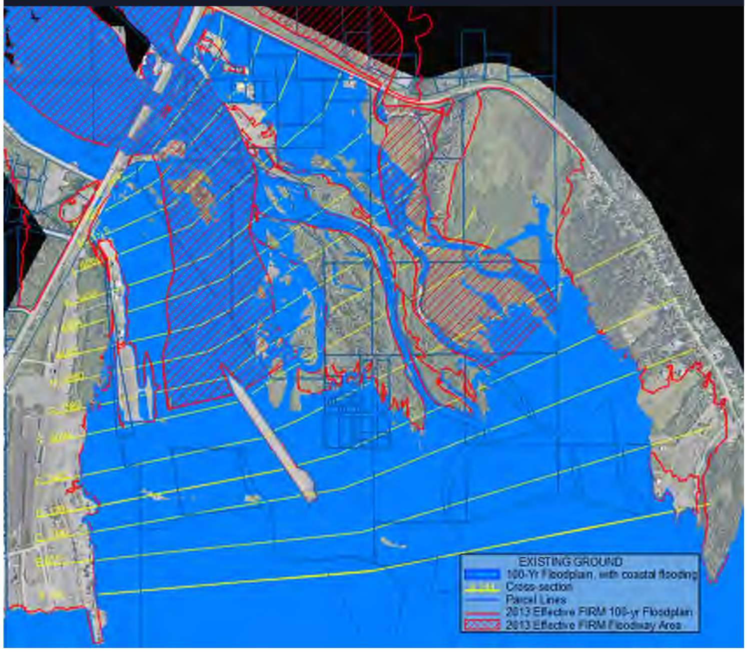
- Requires an alternative funding source. The additional 700 feet of runway length do not qualify for federal funding.
- Impacts the Velocity Zone (tidelands) on the FIRM (flood) map, requiring a revision to the FIRM map. Necessitates additional engineering to provide protection against the Resurrection Bay flood impacts.
- May take longer to obtain permits than for Alternative 2.2 due to tideland impacts, but shorter time than Alternative 1.1.

100-Year Floodplain - Alternative 3.0

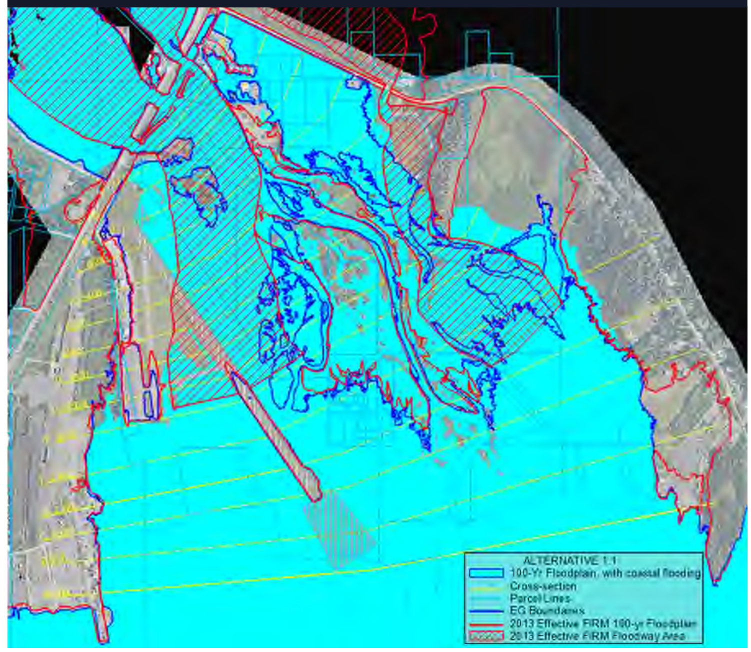


Projected Floodplain Impacts: Changes in the 100-Year Flood

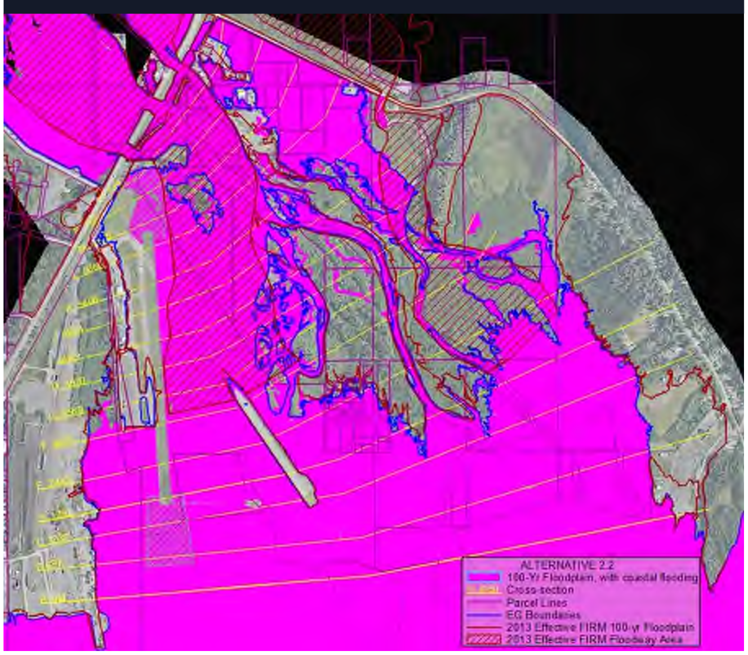
Existing Ground



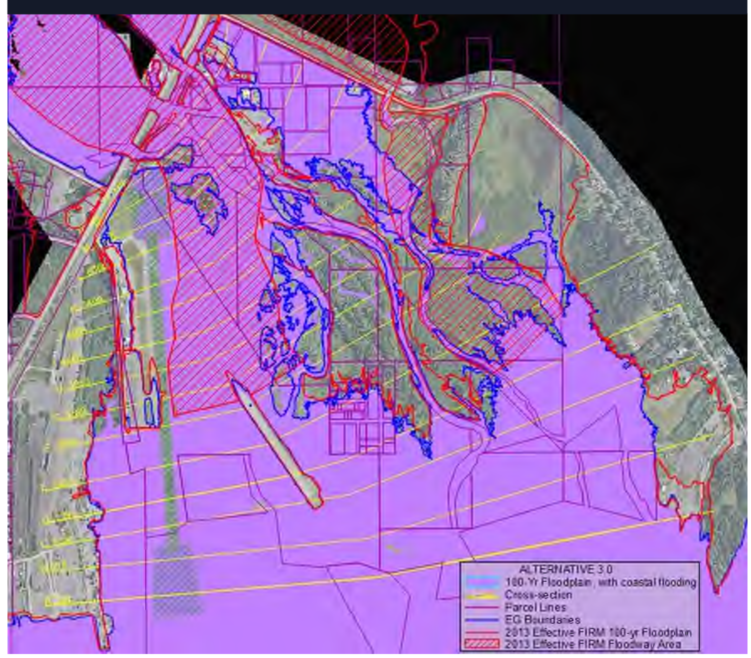
Alternative 1.1



Alternative 2.2



Alternative 3.0

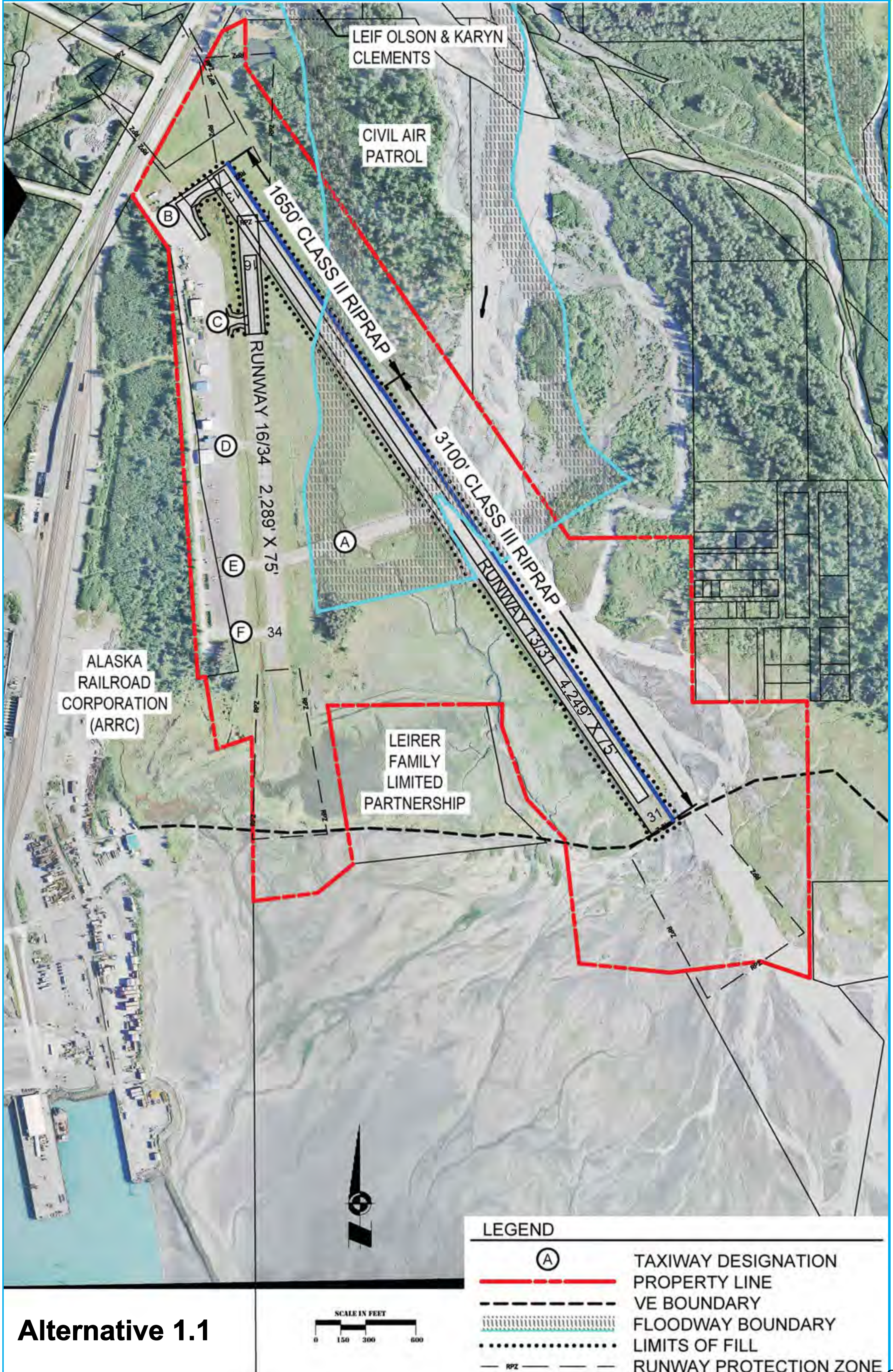


Understanding Possible Solutions
ATTENDEE ACTIVITY

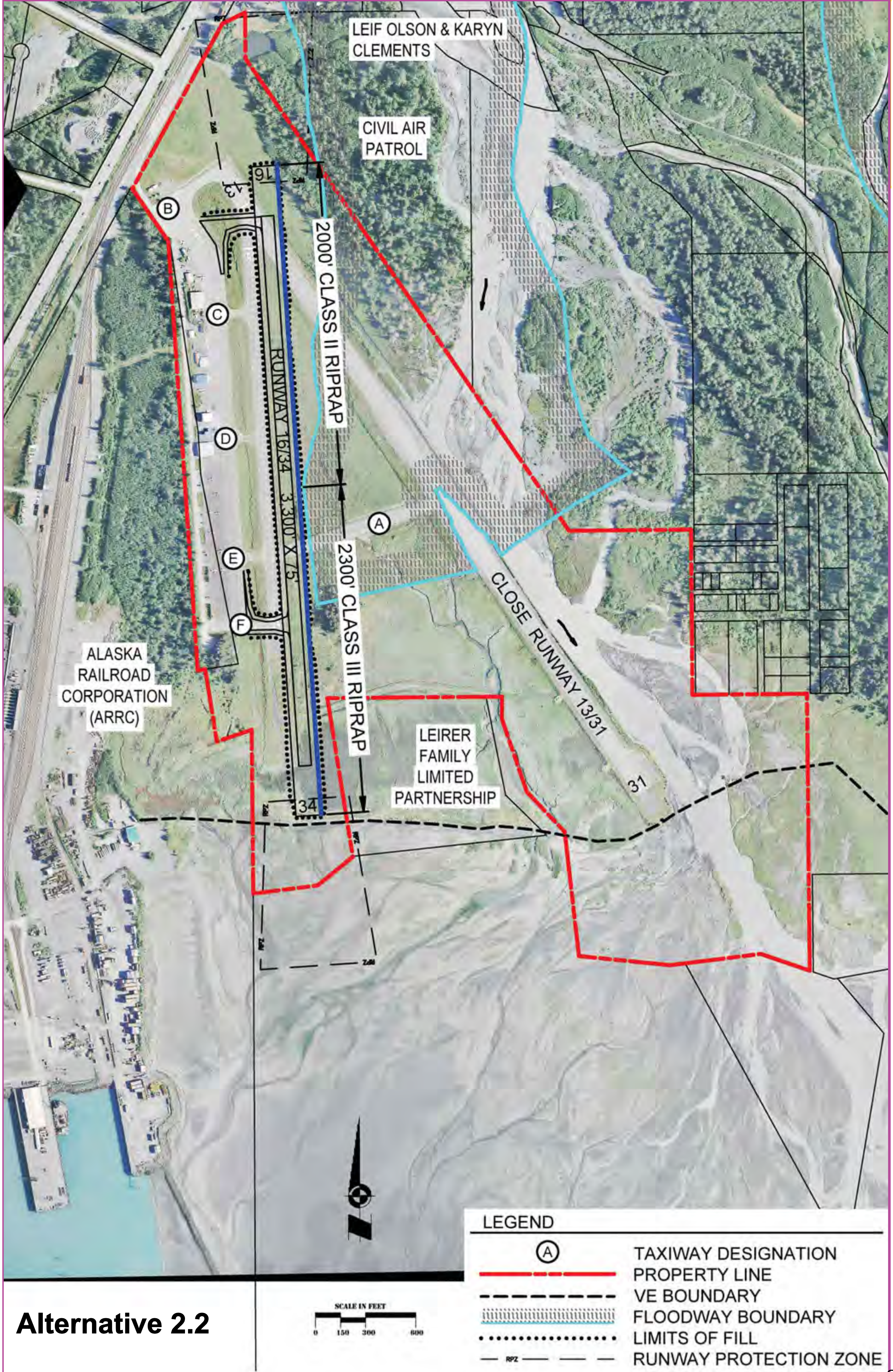
Which aspects of the project are most important to you?

Please place your **YELLOW** sticker in the box next to the criterion you feel is the most important and your **BLUE** sticker by the one you feel is next most important.

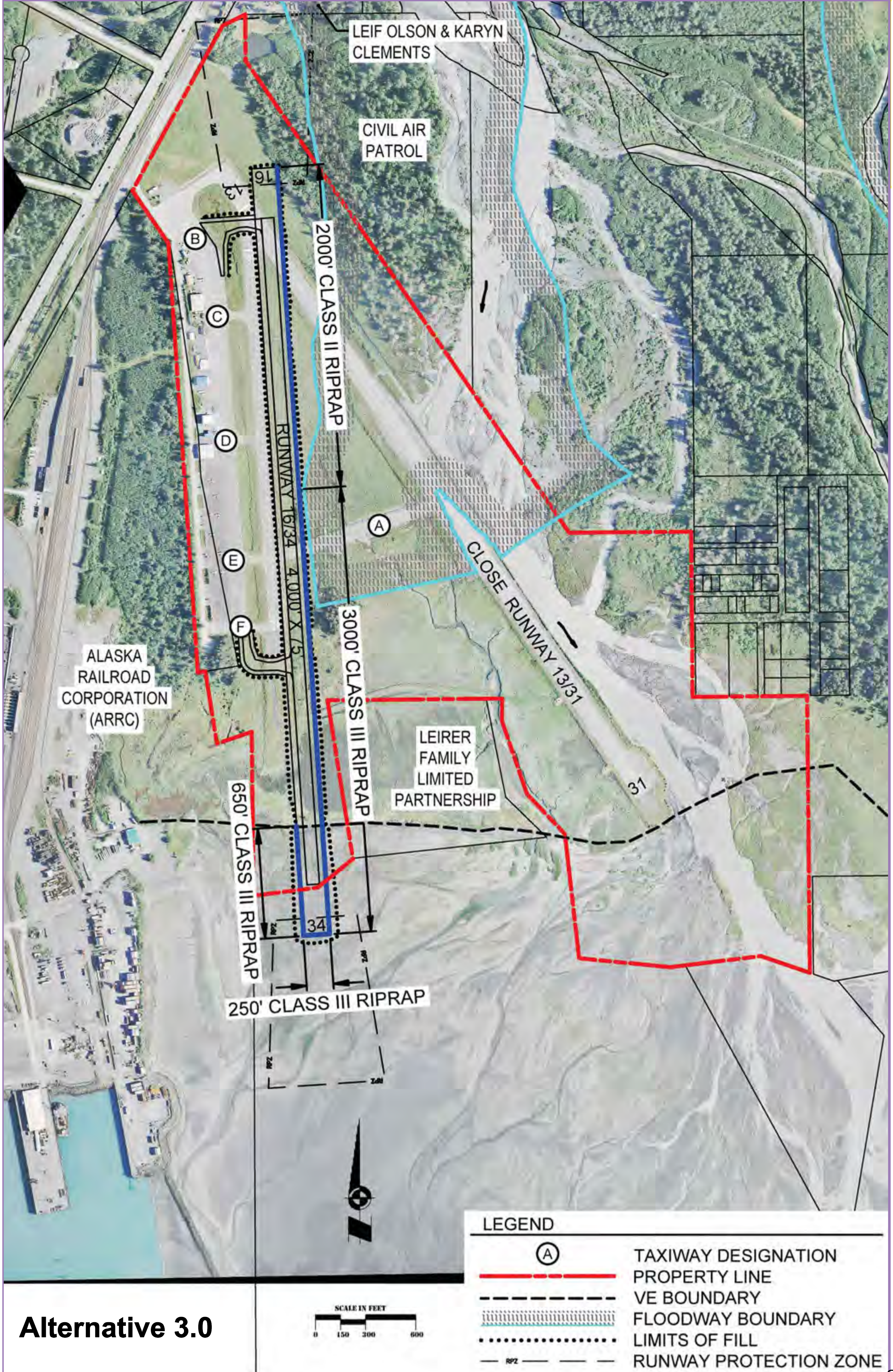
Alternative Evaluation Criteria	
COST • Construction/earthwork cost • Maintenance and operations (M&O) • Right of way—preliminary costs only • Eligibility for FAA funding	
ABILITY TO SERVE THE COMMUNITY'S NEEDS • Medevac • Meets General Aviation (GA) needs • Search and rescue • Economic development	
SAFETY, ENGINEERING, AND USER CONSIDERATIONS *(not covered by Cost)* • Wind coverage • Airspace/Runway Protection Zone (RPZ)/ approach obstructions • User function/runway reliability/level of service (LOS) • Long-term stability/risks • Construction considerations	
ENVIRONMENTAL CONSIDERATIONS • Floodplain/floodway impacts • Fish habitat impacts • Wetlands impacts • Endangered Species Act (ESA)/bald eagle habitat • Human (socioeconomic) impacts—right-of-way impacts, compatible land use, etc.	



Alternative 1.1



Alternative 2.2



Alternative 3.0

MEMORANDUM

Date: April 28, 2016

To: Barbara Beaton, DOT&PF Project Manager

From: Robin Reich and Carla SlatonBarker (Solstice Alaska Consulting) with input and review from Royce Conlon and Angela Smith (PDC)

Subject: Summary of 4/20/2016 Public Open-House Meeting for Seward Airport Improvements Project (#Z548570000)

1.0 Introduction

This document provides a summary of the public meeting held for the Seward Airport Improvements Project on April 20, 2016, in Seward Alaska, at the Rae Building. See Attachments A and B for the project display boards, meeting sign-in sheets, and written comments.

1.1 Meeting Overview

The purpose of the meeting was to (1) present the needs and issues identified through the initial scoping process; (2) present the results of key studies (a Hydrology Report and an Aviation Activity and Facility Requirements Report); (3) present alternatives developed to solve identified issues and needs; (4) present the preliminary list of advantages and disadvantages associated with each alternative; and (5) gather input from community members. These purposes were explained at the welcome station verbally and noted on the meeting agenda.

1.2 Meeting Format

The format of the meeting was an open house, meaning that people could come and go during the posted hours (5:00 pm to 7:30 pm) and visit information stations staffed by project team members.

1.3 Open House Stations/Meeting Information

Informational display boards were created to present project information. Project team members were at stations to help attendees understand information presented and to engage in discussion related to issues or concerns. Attendees were encouraged to write down and submit their comments, but team members noted comment themes and issues for inclusion in this meeting record. The agenda (next page) provides an overview of the meeting format and information presented. Public meeting display boards are included in Attachment A.

Meeting Agenda and Overview

Meeting Purpose

- Provide an overview of the Seward Airport Improvements Project (needs and challenges that the project will address, work that has occurred to date, upcoming steps).
- Present the results of key studies: Hydrology Report and Aviation Activity and Facility Requirements Report.
- Present alternatives developed to solve identified issues and needs.
- Present the advantages and disadvantages associated with each alternative.
- Gather input from community members.

Meeting Format

- **Open House Hours:** 5:00 pm to 7:30 pm
  - Please sign in and then visit the information stations (see detail below) in this lobby.

Open House Stations

- **Station #1: Welcome and Sign in**
- **Station #2: Understanding the Challenges**
  - Learn about the top three challenges that form the backdrop for the Seward Airport Improvements Project:
    - Resurrection River Hydrology
    - Airport Demand
    - Funding
- **Station #3: Understanding the Possible Solutions**
  - Learn about the range of alternatives considered to date, including three viable alternatives, and advantages and disadvantages of each.
  - Share your thoughts on alternatives.
  - Learn about the project's next steps.
- **Station #4: Comment Station**
  - Your written comment is an important part of the process. You'll find comment forms here.

Thank you for your time and participation!

1.4 Attendees

The following list reports information pertaining to attendance:

- Twenty-one members of the public signed in.
- Two people declined signing in.
- Seven project team members were in attendance (two from DOT&PF and five from the consultant team).
- Affiliations noted by attendees included pilot, airport lease holder, media (two local media outlets), City of Seward, Alaska Railroad Corporation (ARRC), residents, and birders.
- Ten people filled out the voluntary information requested by DOT&PF's Civil Rights Office pertaining to gender and race.
- One person completed a comment sheet at the meeting (see Attachment B), another person submitted a comment prior to completing this report, and others took comment sheets with the contact information for submitting comments later.

1.5 Meeting Notification

Table 1 provides a list of the mechanisms used to notify the community about the meeting.

Table 1. Notification Mechanisms

Notification Mechanism	Date/Details
Newspaper Advertisement: *The Seward Journal* (display ad)	April 8, 2016 and April 15, 2016
Newspaper Advertisement: *The Seward City News* (online advertisement)	April 11, 2016 (through April 20, 2016)
Postcard Notice (mailed to project mailing list)	April 7, 2016, received in Seward; to project mailing list (approximately 180 names from 2008 Master Plan project, augmented with attendees at Seward Airport Improvements Project public meeting #1 and others who expressed interest in the project.)
Email Announcement to City List (pdf of postcard to City)	April 8, 2016
Flyers Posted in Town (Posted by City; using postcard design)	April 8, 2016
Website Update: Meeting notification, meeting agenda	April 19, 2016
Email communication with Stakeholder Working Group members (SWG), about the SWG meeting and the public meeting	March 7, 2016; April 14, 2016; April 19, 2016

2.0 Informational Board Highlights

This section summarizes information presented on the informational display boards. These boards formed a foundation for conversations between attendees and project team members and for comments submitted. Section 3.0 presents a summary of comments themes heard at the meeting. Attachment A includes copies of the boards.

2.1 Understanding Challenges: Hydrology

The informational boards noted that flooding of the Resurrection River has caused:

- Extensive erosion
- Reduction of pavement strength

The hydrology board defined a **braided river** and pointed out the challenges of trying to control one. Attempts to control braided rivers provide short-term benefits that require constant maintenance and dedicated funding sources.

Determining solutions to river flooding that are cost effective, long lasting, and able to be permitted is a difficult challenge considering that main runway is in the river flood zone.

Presented information described solutions to the hydrology challenges that were studied, and resulted in three project alternatives presented in subsequent display boards. The project team solicited feedback on the alternatives and their advantages and disadvantages.

Potential Solution	Project Alternatives
Raise, Armor, and Reconstruct Runway 13/31	Alternative 1.1
Close Runway 13/31 and Improve Runway 16/34, instead	Alternatives 2.2 and 3.0
Reroute and/or Dredge the Resurrection River	Not an option

2.2 Understanding Challenges: Aviation Demand

The informational boards on this subject noted that a facility as large as the existing airport is not needed to accommodate the expected future aviation activity. Securing Federal Aviation Administration (FAA) funding to rebuild the airport to the existing size (two runways, one of which is 4,249 feet by 100 feet) is not likely possible. The boards noted that airport demand would be met by a facility designed for Aircraft Approach Category B and Aircraft Design Group II (B-II), defined as a runway 3,300 feet long by 75 feet wide.

The boards noted FAA design guidance requires that the size of the facility be determined by the selection of a design aircraft. The design aircraft is the most demanding aircraft (or family of aircraft) that REGULARLY use the airport. Regular use is defined as 500 operations (landings plus takeoffs) each year. The most demanding aircraft is the King Air B200, which is used for medical evacuations. This aircraft, plus others in this family of aircraft, meet the 500 operations threshold. The board noted that larger aircraft (jets) do not meet the 500 operations threshold.

2.3 Understanding Challenges: Funding

The informational boards noted the following key points: 218 airports compete for Airport Improvement Program (AIP) funding in Alaska; of these, about 20 airports usually get funding from the program; AIP funds have not grown over the years, but the cost of constructing airport improvements has and will continue to grow (the money is not going as far as it used to); this is a competitive process (projects rank higher if they have local or in-kind money to help; projects rank higher if they are off the road system, such as in Rural Alaska, where they depend on the airport for transport of food, medical supplies, etc.).

2.4 Understanding Solutions: Alternatives, Advantages and Disadvantages

Station 3.0 presented information on the alternatives development process that resulted in the three alternatives presented at the meeting. This station also displayed an information board for each of the three alternatives that included a summary of the advantages and disadvantages. See Attachment A for the information and graphics presented on the boards.

Alternative 1.1: Reconstruct the Existing Main Runway (13/31)
Reconstruct and raise Runway 13/31 above the 100-year flood level. Install riprap to protect the embankment. Adjust elevations of Runway 16/34 and Taxiways B and C to match new runway elevation. Eliminate Taxiways A, D, and E to comply with new FAA guidance.

Alternative 2.2: Shift Existing Crosswind Runway (16/34) East and Add 1,011 Feet (3,300 feet x 75 feet). *Close Runway 13/31 and allow floodwater to overtop it. Reconstruct and raise Runway 16/34 above the 100-year flood level. Install riprap to protect the embankment. Relocate Taxiway B and adjust Taxiway F to match new runway elevation. Eliminate Taxiways A, C, D, and E to comply with new FAA guidance.*

Alternative 3.0: Shift Existing Crosswind Runway 16/34 East and Extend by 1,711 Feet (4,000 feet x 75 feet). *Close Runway 13/31 and allow floodwater to overtop it. Reconstruct and raise Runway 16/34 above the 100-year flood level. Install riprap to protect the embankment. Relocate Taxiway B and adjust Taxiway F to match new runway elevation. Eliminate Taxiways A, C, D, and E to comply with new FAA guidance.*

2.5 Attendee Activity: Which Aspects of the Project Are Important to You?

Following the informational boards depicting alternatives, a display board asked attendees to place a YELLOW sticker next to the criterion considered most important and a BLUE sticker in the box next to the criterion considered the next most important. Criteria displayed and results of this activity are in Section 3.0.

3.0 Comment Summary and Themes

Conversations between team members and attendees focused on project findings related to hydrology, aviation demand, and funding.

Comments offered verbally were focused largely on alternatives. The section below organizes comments heard according to each alternative.

COMMENTS REGARDING Alternative 1.1: Reconstruct the Existing Main Runway (13/31)

Public comment themes expressing support for Alternative 1.1:

- The economy of Seward depends on having an airport that can accommodate jets, both scheduled service and unscheduled service. Businesses in Seward (lease holders, businesses whose clients would like to travel via jet) are impacted by any alternative that does not restore the long runway and allow removal of landing restrictions. Alternative 1.1 provides for this need.
- It is important to protect the existing infrastructure—spending money to protect the existing investment makes economic sense from a short-term and long-term perspective. To give Runway 13/31 to the river is to throw money into the river.
- Without maintaining the main runway as a levee, the floodwater will quickly overrun it and flow into the center portion of the airport. Then the river will start eroding the other Runway (16/34). Dieckgraeff Road aka Levee Road, just across the highway from the airport, was designed and constructed in a floodplain to be a protective levee. Similarly, raising the elevation, adding armor protection, and reconstructing Runway 13/31 as a protective levee/runway is a superior alternative to closing Runway 13/31 and improving Runway 16/34.
- Runway 13/31 is needed because 40 to 50 mph winds occur about 50 times each winter that align for a landing or takeoff on Runway 31 but not the relocated runway. Medevac and search-and-rescue operations use and need Runway 13/31 during these conditions.
- Alternative 1.1 is preferred over Alternatives 2.2 and 3.0, because of the bird impacts associated with Alternative 2.2 and 3.0 (see this comment also included under Alternatives 2.2 and 3.0, below). The tidal flats/estuary area adjacent to or within Alternatives 2.2 and 3.0 is important migratory bird staging area during poor weather conditions. Birds, including Arctic Terns and waterfowl, use the area for nesting, and song birds use the uplands surrounding the airport. The tidelands provide important habitat.
- Consider culverts under Runway 13/31 rather than relocating the runway.
- Use a concrete stabilized base on the main runway, as a way to rehabilitate the existing main Runway 13/31.

Public comment themes expressing understanding of Alternative 1.1 disadvantages:

- Conversations acknowledged that this alternative raises the flood level of the river the most, which impacts properties east of the airport.

- Conversations acknowledged that cost is a consideration in selecting the preferred alternative.

COMMENTS REGARDING Alternative 2.2— Shift Existing Crosswind Runway (1634) East and Add 1,011 Feet (3,300 feet x 75 feet)

During the public meeting, team members discussed this alternative as the most viable alternative in terms of design and engineering considerations. It would meet the community's near-term aviation needs for GA and medevac operations.

Public comments themes related to Alternative 2.2:

- Opposition to this alternative because it does not accommodate jets.
- This alternative, which involves closing main Runway 13/31, will allow floodwater to have better access to the existing floodplain. This is not a reasonable or desirable direction; without maintaining the main runway as a levee, the floodwater will quickly overrun it and flow into the center portion of the airport. Then the river will start eroding Runway 16/34 in the same way as it does now. That brings the impact of flood damage very close to the existing infrastructure of hangars, buildings, and Airport Road, resulting in an extremely expensive alternative.
- The Seward Marine Terminal Expansion Planning Project proposes dredging for a boat barge basin between the airport and the ARRC property. These wetlands, with its layers of stable clay and compacted silt, are very important for reducing flood impacts by controlling and filtering both flood waters and high tides. Removal of these stable wetlands, which includes a salmon stream complex, will bring the ocean permanently to the airport property line under Alternatives 2.2 and 3.0. (This comment is included under both Alternative 2.2 and 3.0.)
- Understanding that this alternative meets FAA design criteria, and it is the one that can be funded without needing an additional funding source.
  - Some attendees expressed frustration that more project funding is not available/thought this should be different.
  - Some attendees expressed acceptance of this fact.
- Support of this alternative because it seems to suit Seward (considered by some as a small town that really only needs a small airport, especially considering how good the road is now between Seward and Anchorage.)
- Concern over impacts to tidelands, wetlands, and bird habitat.
- Concern over impacts to ARRC development (this alternative brings the air traffic closer).
- Support for this alternative IF the longer runway comes later.
- Concern that eventual development to Alternative 3.0 and a 4,000-foot runway would not occur, due to unforeseen reasons or permitting/regulatory/funding issues.
- Concern that the community's infrastructure is going backwards under Alternative 2.2, which does not match the economic development approach of the City, ARRC, or other economic development interests.

- Concern that Alternative 2.2 brings airport facilities closer to the ocean, in a time of sea-level rise.

COMMENTS REGARDING Alternative 3.0—Shift Existing Crosswind Runway 16-34 East & Extend by 1,711 Feet (4,000 feet x 75 feet).

Public comments themes related to Alternative 3.0 (some of these comments are also listed under both Alternative 2.2 and 3.0)**:**

- This alternative, which involves closing main Runway 13/31, will allow floodwater to have better access to the existing floodplain. This is not a reasonable or desirable direction; without maintaining the main runway as a levee, the floodwater will quickly overrun it and flow into the center portion of the airport. Then the river will start eroding the other Runway 16/34 in the same way as it does now. That brings the impact of flood damage very close to the existing infrastructure of hangars, buildings, and Airport Road, resulting in an extremely expensive alternative.
- The Seward Marine Terminal Expansion Planning Project proposes dredging for a boat barge basin between the airport and the ARRC property. These wetlands, with its layers of stable clay and compacted silt, are very important for reducing flood impacts by controlling and filtering both flood waters and high tides. Removal of these stable wetlands, which includes a salmon stream complex, will bring the ocean permanently to the airport property line under Alternatives 2.2 and 3.0.
- Concern over impacts to tidelands, wetland, and bird habitat.
- Concern over impacts to Alaska Railroad Corporation development (this alternative brings the air traffic closer).
- Concern that Alternative 3.0 brings airport facilities closer to the ocean, in a time of sea-level rise.

Suggestions for Further Study

- Consider culverts under Runway 13/31 rather than relocating the runway.
- Consider using a concrete stabilized base on the main runway, as a way to rehabilitate the existing main Runway 13/31.
- Complete bird, tideland, habitat, and wetlands impact analysis.
- Complete more cost studies that evaluate flood impact costs, right-of-way costs, socioeconomic costs of no long runway and loss of infrastructure, and tideland/bird/habitat costs across all alternatives, in order to fully understand alternatives' impacts.
- Continue to refine the understanding of each alternative's flooding implications in relationship to the existing airport infrastructure and planned ARRC facilities, including changed flood levels and sediment deposits, and in terms of advancing sea levels and tides.

General

- A question was posed about the project's plans for fencing.

- An idea was posed/request made that a couple of islands near the tidelands be dredged to allow easier access for floatplanes.
- Several attendees requested that an alternative include river dredging.
- Several people noted the importance of the airport for businesses and the Seward economy.

Attendee Activity: Which Aspects of the Project are the Most Important to You?

This display board asked attendees to rank the top two criteria that are most important to use when evaluating alternatives: a YELLOW sticker in the box for the criteria considered most important and a BLUE sticker in the box for the criteria considered the next most important. Attendee responses are noted.

Alternative Evaluation Criteria	
COST • Construction/earthwork cost • Maintenance and operations (M&O) • Right of way—preliminary costs only • Eligibility for FAA funding	NO STICKERS PLACED
ABILITY TO SERVE THE COMMUNITY'S NEEDS • Medevac • Meets general aviation (GA) needs • Search and rescue • Economic development	4 YELLOW STICKERS
SAFETY, ENGINEERING, AND USER CONSIDERATIONS *(not covered by Cost)* • Wind coverage • Airspace/Runway Protection Zone (RPZ)/ approach obstructions • User function/runway reliability/level of service (LOS) • Long-term stability/risks • Construction considerations	3 BLUE STICKERS

ENVIRONMENTAL CONSIDERATIONS • Floodplain/floodway impacts • Fish habitat impacts • Wetlands impacts • Endangered Species Act (ESA)/bald eagle habitat • Human (socioeconomic) impacts—right-of-way impacts, compatible land use, etc.	2 YELLOW STICKERS 3 BLUE STICKERS

###

Subject: Seward Airport Improvements feedback

From: jamie.lynn.auletta@gmail.com

To: solsticeak@solsticeak.com

Thu, 12 May 2016 17:44:36 -0800 (AKDT)

comments2	Seward Airport Improvement Project
name	Jamie
satisfied	do not add to list
comments	This project saddens me very much and I do not see as a necessary thing to be done. I DO NOT support it - the pilots in town didn't even show up to the community meeting, that should speak volumes. Those of us that did show up were very concerned about preserving the environment surrounding the airport and the effects it would have on the birds, especially the migratory birds that depend on the environment surrounding the airport for survival as a stop over point.I do not support the building of a new runway or the extension of the existing runway through the pond out onto the mud flats. The pond is a stop over for many migratory birds and is the only option for some species - and studies have shown that when birds are forced to choose different stop over locations due to habitat loss their survival is compromised. If flooding of the runway is a concern, extending the strip into the mudflats make absolutely no sense at all. Have you seen our storm su! rges?Lets stop destroying the environment that so many of us that live here enjoy - this town just keeps getting more and more industrial and it is a shame. I have no desire for more airport traffic and the continued growth that may follow. I do not buy that this is for medical evacuation reasons or to make maintenance of the runway easier and cheaper - we live in Alaska, it is always going to hard and expensive and the value of the environment and the wildlife it supports, in my opinion, surpasses any 'seen' need for this project.Additionally, you cannot just expect the birds to stop trying to come here - what about bird/plane collisions?Some of the plans require cutting down wooded areas that are home to many bald eagles and various owl species.I do NOT support this project, it is not necessary.
zipcode	
comments1	
email	jamie.lynn.auletta@gmail.com

SEWARD CITY NEWS

read it, write it

Monday, May 2, 2016

CITY OF SEWARD, FEATURED

Planners Grapple With Conflicts Between Resurrection River and Airport

April 28, 2016 11:57 am by Rick Smeriglio Views: 304

Resurrection River in flood stage overtops main runway of Seward airport. Photo courtesy of Seward/Bear Creek Flood Service Area.

By Rick Smeriglio for SCN —

Resurrection River flows to the sea through a broad plain between the mountains. Territorial authorities in 1920 built a gravel landing strip at the extreme downstream end of the floodplain. No other suitable place existed then. Seward has no other place for an airport now. Because the dynamic river will not go away and will not stay put, Alaska DOT&PF has a problem keeping its airport high and dry. As part of their Seward Airport Improvement Project, DOT&PF and the Federal Aviation Administration will consider alternative ways of keeping Resurrection River away from the runways.

Lower Resurrection River tumbles huge loads of gravel downstream while on its journey to the sea. Over time, as gravel builds up toward its downstream end, the streambed rises and forces the river to shift course. Resurrection River has moved hundreds of yards east to west and now sluices against the main runway on the east side of the airport. Heavy autumnal rains swell the river, causing it to escape its banks flowing to lower ground. It has overtopped the runway numerous times over the years, especially in 2013.

DOT&PF hydrologist Paul Janke said, "The problem is that Resurrection River is a braided river which means it is not just one channel; it's numerous channels. There is a tremendous amount of sediment that comes down the river, primarily from Exit Glacier. When the river gets downstream of the Seward Highway, the slope on the river is less than it is upstream so the moving river cannot push all the sediment into the bay. The sediment falls out and it's forcing the river to move. In this case, the water is moving toward the runway … The river has been overtopping the runway more frequently. In 2013, the runway was overtopped ten times. We've had erosion problems. The problem is that the middle third of the runway is a FEMA mapped floodplain meaning that it is the main channel of the river."

Attendees at DOT&PF open house meeting view information about Seward airport project. Photo by R. Smeriglio.

Janke went on to explain that raising the elevation of the runway significantly (seven to 12 feet) above the floodplain would shift water back to the east and cause flooding and erosion to private property in the area. Janke said that would create a liability for DOT&PF. His agency would have to purchase the property. He said that historically, before human development, the river gushed out of the mountains and then slowed as it spread out across the broadest part of the floodplain.

"With human development we have constrained the river. The sediment can't spread out."

Janke did not think that periodic dredging to remove sediment and gravel would work. As a hydrologist, he favored the idea of maximizing the width of the floodway consistent with existing development.

"I don't believe that dredging would last very long. It would be very expensive; it would have to be year after year after year continuously forever just like port of Anchorage. Then you would get a big discharge and it would fill up whatever you dredged and it would be of no value," said Janke.

Royce Conlon, PE, works as a civil engineer for and president of, PDC Inc. Engineers, the firm hired by DOT&PF to design the airport improvements. She serves as the project manager for PDC. She characterized her firm as just in the beginning phases of the project where it does not yet know what to design.

When asked why DOT&PF needed to do anything at all other than maintenance for the airport, Conlon said, "If the river wasn't doing what the river is doing, we probably wouldn't even be here. We were hired by DOT to develop a long-term solution to the flooding that occurred in 2013. The flooding of 2013 raised the bar enough that they realized they needed to have a long-term solution. The cost of maintaining was getting more than they could handle … they were literally dumping money into the river. Our project is to develop a long-term-sustainable facility."

The runway pavement now has a weight restriction of 12,500 pounds whereas previously, C-130 cargo aircraft, which when fully loaded have landing weights of up to 130,000 pounds, touched down in Seward. DOT&PF project manager Barbara Beaton said via e-mail that her agency had no records of the designed weight limits of the main runway as designed in the 1950s. She wrote that, " ... it was obviously built for aircraft heavier than 12,500 pounds."

Conlon said, "The theory is that when the water rose ... it removed the fine materials ... the glue ... from between the larger rocks [in the runway fill] ... We don't have testing before and after ... We know through testing that there is not adequate strength to the pavement to allow heavy loads."

Seward city manager Jim Hunt said of the airport, "There's an old saying in rural areas that if you lose your airport, your town dies ... it's a key economic component ... it's important for emergency response, for the businesses across the bay ... it's especially critical in supporting this side of south central Kenai [peninsula]. A couple of years ago we had multi-state military training and practice. Because of the fact that the airport was closed, it meant that they couldn't bring some of the aircraft that were going to be a key component of the exercise, in ... We're going to do everything we can do to preserve the airport."

In regards to the reduced weight load-limits currently placed on the airport Hunt said, "The impacts are several, but one of the critical effects is the ability of Life Flight and Life Med to come in with their larger planes, the larger twins, their jets. You know, we've had some fairly well known business people out of Seattle who have wanted to bring their private jets in for meetings. For instance, Paul Allen when he had his yacht here. They wanted to fly in some people because they were meeting with the Rasmussen Foundation and they couldn't come in. They couldn't bring their planes in."

Planners for the project have three alternatives under consideration. All alternatives will accommodate aircraft with requirements up to those of a Beechcraft King Air B200 (runway load limit 12,500 pounds, runway length at least 3,300 feet.) Air ambulance services in Anchorage currently use this aircraft. All alternatives call for rebuilding the airport runways to accommodate airplane design group II (wingspan less than 79 feet) and airport approach category B (approach speed less than 121 knots). According to Beaton, data on aircraft use of the airport show than almost all use fits these categories. Beaton said that while the FAA will fund almost 94 percent of the project, it would only support building airports to accommodate existing and reasonably projected growth.

Current alternative 1.1 calls for raising existing runway 13-31 (main runway, east side) in place and armoring it with rip-rap rock to protect it from Resurrection River. Alternative 2.1 calls for closing runway 13-31 and raising runway 16-34 (shorter crosswind-runway, west side) and shifting it eastward while protecting it with rip-rap. Alternative 3.0 does everything that alternative 2.1 does and also extends runway 16-34 to 4,000 feet long.

When asked if the City of Seward could accept a designed load limit of 12,500 pounds and a designed runway rating of BII, Hunt said, "We would want to have the higher rating. We have to have the ability to receive larger planes, cargo, transport ... It would make no sense at all to rebuild and repair it to the standard that it's limited to now."

"Number one, and I didn't see it addressed, [at the open house meeting] the number one issue is the river, maintaining, dredging, moving, the river. Nothing can be done until the river is addressed, in my opinion," Hunt said.

The public comment period for this phase of the project closes May 13, 2016. For additional information go to the project's website at www.state.us/creg/sewardairport

Image courtesy of Alaska DOT&PF.

Image courtesy of Alaska DOT&PF.

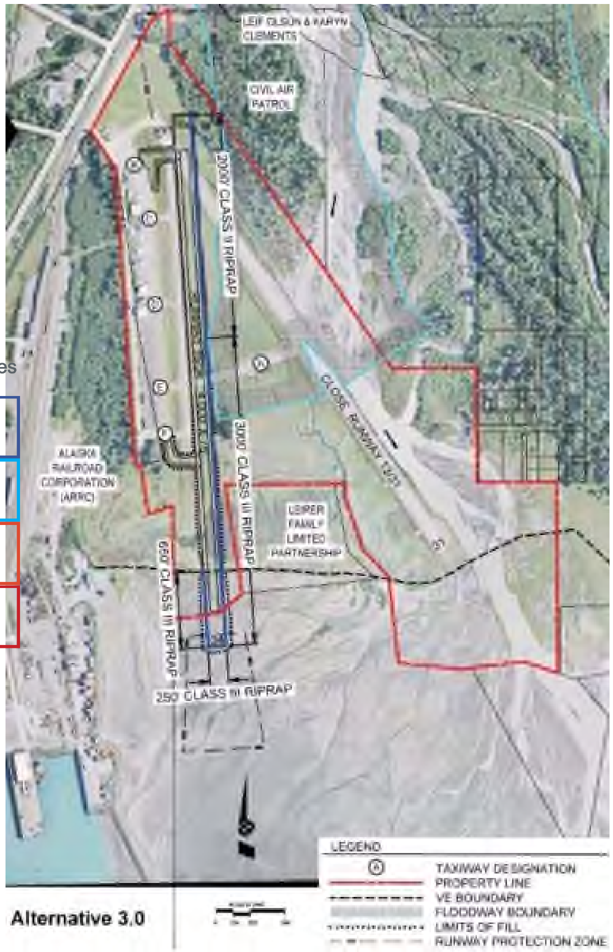


Image courtesy of Alaska DOT&PF

Your Comments

Please share your thoughts and ideas below regarding information presented at this meeting (challenges, solutions, alternatives, advantages or disadvantages of alternatives) or the project in general. Place this sheet in the comment box or submit your thoughts later (by May 13, 2016, please) to the address below.

Name (optional): WALTER CORRIGAN

Address (optional): PO BOX 770 SEWARD 99664

I'VE FLOWN OUT OF SEWARD FOR 23 YEARS, COMMERCIALLY, SEARCH AND RESCUE, AND PRIVATE FLYING. FOR ME AND HOW I FLY NOW, 16/34 WOULD BE JUST FINE. BUT, FOR THOSE THAT FLY UNDER EMERGENCY CONDITIONS (MEDEVAC/SAR/ETC) 13/31 CAN BE ABSOLUTELY NECESSARY, ESPECIALLY IN THE WINTER MONTHS. THERE IS A REASON WHY 13/31 WAS BUILT AND THAT REASON IS NO LESS VALID TODAY. IF I CAN BE OF HELP WITH THIS PROCESS, I AM AVAILABLE. I'M A COMMERCIAL PILOT WITH 2500 HOURS, AND A RETIRED NAVAL FLIGHT OFFICER WITH 5,000 NAVY HOURS.

[signature]

walter.corrigan@gmail.com

Please provide your comment today or send written comment (by May 13, 2016, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com.

Carla SlatonBarker

From: Carla SlatonBarker <slabar@mtaonline.net>
Sent: Thursday, June 2, 2016 11:29 AM
To: 'Carla SlatonBarker'
Subject: FW: Seward Airport Improvements Project: birds

From: Tasha DiMarzio [mailto:tjbluebird@yahoo.com]
Sent: Wednesday, June 1, 2016 5:26 PM
To: slabar@mtaonline.net
Cc: robin@solsticeak.com
Subject: Seward Airport Improvements Project: birds

Hi Carla,
Sorry, I didn't respond to your email sooner. It's not for my lack of caring, I do have sincere interest in this project.
I am currently preparing for my field season so I have been swamped. I leave tomorrow for 2 months and will be on the Yukon Delta National Wildlife Refuge totally out of contact.
For my lack of time, I am going to refer you to Sadie Ulman and fellow birder and Researcher at the Alaska Sealife Center sadieu@alaska sealife.org I have talked to her and she will be more then happy to help you gather any type of data that would be useful to this project.

In the mean time, I quickly look at the data on ebird.org (which is where I enter all of my data) It is open to all the public to look at and gather information.

The first link shows a list of the highest number of each individual species that has been recorded at the airport at one given time.

http://ebird.org/ebird/sightings?listType=high_count&locInfo.regionType=hotspot&locInfo.regionCode=L586881&yr=all&locInfo.parentCode=US-AK&sortBy=taxon_order&o=asc

159 different species have been recorded utilizing the airport pond and mud flats over the years. That is a very high number of species for Alaska that depend on this habitat.

The next link shows the timing and density of the birds that use the airport ponds.

http://ebird.org/ebird/GuideMe?cmd=decisionPage&getLocations=hotspots&hotspots=L586881&yr=all&m=

This year alone since Jan 1, 2016 96 different species have utilized the airport ponds.

During migration Mid March -the end of May many species of migratory birds such as geese, shorebirds and Sandhill Cranes stop at the airport mud flats and ponds to refuel. Especially when there is north winds and rains,they can not continue their migration and are grounded for up to 10-14 days at a time.
Taking away this area that is vital to migrating birds to build an airport could really affect and displace birds making it hazardous for pilots.
This land also hosts the only Arctic Tern nesting colony on the Kenai Peninsula, these are a very fragile species and displacing their colony could be detrimental to their population.

Along with birds both Pink and Chum salmon spawn in the ponds and use the surrounding streams to access the ponds, building or extending a run way would block their spawning access.

You also must take into consideration the work that the Alaska Railroad and their adjacent property changes have planned along with how winter storms and tides will affect the proposed run ways out into the tidal flats.
I do not believe that the community as anything to gain by spending thousands of dollars on new runways. We should just continue to fix the current ones and manage what we have.

Thank you for contacting me and taking birds and other wildlife into consideration in the planning of this project.

Tasha

From: "Carla SlatonBarker" <slabar@mtaonline.net>
Date: May 23, 2016 at 10:26:57 AKDT
To: <tjbluebird@yahoo.com>
Cc: "'Robin Reich'" <robin@solsticeak.com>
Subject: Seward Airport Improvements Project: birds

Hi Tasha,
Thanks for attending the Seward Airport project meeting in April. You mentioned that you have some data related to bird use/bird numbers at the airport. Would it be possible to send that information to us? Thanks!
Carla

Carla SlatonBarker
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, Alaska 99503
907.929.5960

SOLSTICE
alaska consulting inc

Check out our website: www.solsticeak.com

Carla SlatonBarker

From:	rainyday <c_griz@yahoo.com>
Sent:	Wednesday, April 27, 2016 9:08 PM
To:	Carla@solsticeak.com; Robin@solsticeak.com
Subject:	Seward Airport high tide photos
Attachments:	P1040167-Seward-airport-at-high-tide.jpg; P1040171-Seward-Airport-at-high-tide.jpg; Screen Shot 2016-04-27 at 7.42.20 PM.png; P1040171-Seward-Airport-at-high-tide-comments.jpg

Hi Carla and Robin,

Attached are some photos of the Seward Airport taken on March 10, 2016 near the high tide of day of 11.9'. As you know, this is not the highest tide, which can reach 13.7'.

I am very concerned that closing main Runway 13-31 will indeed allow floodwater to have better access to the existing floodplain as stated. This is not a reasonable or desirable direction. I fear that without maintaining the main runway as a levee, the floodwater will quickly overrun it and flow into the center portion of the airport. Then the river will start eroding the other runway 16-34 in the same way as it does now. That brings the impact of flood damage very close to the existing infrastructure of hangars, buildings, and Airport Road, resulting in an extremely expensive alternative.

I understand Dieckgraeff Road aka Levee Road, just across the highway from the airport, was designed and constructed in a flood plain. Similarly, raising the elevation, adding armor protection, and reconstructing Runway 13-31as a protective levee/runway is a superior alternative to closing Runway 13-31 and improving Runway 16-34.

This project must also consider the impending sea level rise in which the high tide shown in my photo may become the normal scenario for a moderate to low tide. The protective beach berm, reduced to an island, may be submerged more frequently, resulting in reduced protection from storm erosion.

The next protective barrier is the former road to the Naval Radio Station. It is submerged at high tides now. Close mowing along this former road reduces the ability of plants to maintain their roots, and thus their function to control erosion. The Airport Plan should include restrictions on mowing along this former road.

Note that the Alaska Railroad Master Plan proposes dredging for a boat barge basin between the airport and the AKRR property. This wetlands, with its layers of stable clay and compacted silt is very important for reducing flood impacts by controlling and filtering both flood waters and high tides. Removal of this stable wetlands, which includes a salmon stream complex, will bring the ocean permanently to the airport property line.

Extending Runway 13-31 will bring it extremely close to this property line, proposed boat barge basin, and ocean impacts. Consider the high costs of construction in wetlands, raising the elevation, and adding protective armoring for this alternative. Consider too, the negative impacts to wildlife and the environment.

Historic photos show the wild glacial Resurrection River created the entire alluvial fan from one side of the bay to the other. Artificial fill has extended development from the AKRR yard to the boat harbor, highway, and Lagoon. Allowing the river to have "better access to the existing floodplain" means utter destruction of all the infrastructure now in this floodplain.

I believe the most cost-effective and viable alternative is to maintain and improve existing Runway 13-31 as a levee/runway, and maintain the rest of the current infrastructure.

Thank you for your consideration,
Carol Griswold
Seward, Alaska

Carla SlatonBarker

From: rainyday <c_griz@yahoo.com>
Sent: Friday, June 3, 2016 12:44 PM
To: Carla SlatonBarker
Subject: Re: Seward Airport high tide photos

Hi Carla,

A recent event, detailed below, has raised my awareness of the regional significance of the Arctic Tern colony just south of runway 13-31. I hope this information will be considered when making decisions on the Seward Airport Master Plan.

Thank you,
Carol Griswold
Seward

June 3, 2016 Tragedy at Arctic Tern colony
Seward, Alaska

On Friday, May 13, while I was away at the Kachemak Shorebird Festival, tragedy struck the Arctic Tern colony at the head of the bay.

Four other birders, however, witnessed the catastrophe as five Alaska Natives methodically harvested every Arctic Tern egg and other wild bird eggs. According to the birders, they walked along the edges of the ponds, waded to the little islands, probed all along the beach ryegrass berm, searched above the high tide line, and hunted through the uplands habitat, gathering eggs.

The terns were frantic, as were the birders, but the “subsistence” eggers did not stop. When all the eggs were gone, the terns gave up and abandoned the colony.

I did not learn about this disaster until May 22nd. After I got back from the festival, I did notice how quiet it was with very few terns flying around. Also there were a number of NORTHERN PINTAILS, NORTHERN SHOVELERS, GREEN-WINGED TEAL, and MALLARDS in pairs. This seemed unusual as normally the momma is incubating or has ducklings in tow. GREATER YELLOWLEGS were scarce, often none seen or heard.

The magnitude of the illegal egging gradually dawned as remnant tern activity dwindled from a few terns parading around with tiny fish, to just a few still fishing in the pond, to just occasional over flights. The persistence of paired ducks revealed which family’s nest was plundered.

On May 24 around 5 pm, I witnessed a very strange sight. A huge flock of about 150 terns flew high above the head of the bay in a wide circle, flashing white and then gray like a flock of sandpipers, flying in synchrony. Not only was this odd in the middle of the nesting season, but the sound! Instead of the usual Top Gun, razzle-dazzle, fearless blast, the terns were mewing, a muted, mournful cry. I felt so sad. It felt like they were saying good-bye and taking one last look around. Unlike the fall farewell, there were no young ones with them, nor would there be.

The Terns cannot start over. After flying 10,000 miles or more from their wintering home on the Antarctic ice pack, they only have so much energy and time for courtship, incubation (3 weeks), and raising their babies (4 weeks to fledge). By taking all the eggs, a whole generation of Terns was senselessly wiped out.

The loss of the protective terns affects the few remaining nesting birds. Without their aggressive vigilance, the remaining birds are at risk. A single eagle flying over generates a response from the 6 remaining MEW GULLS. While they are chasing the eagle, a predator like a Raven or Crow could fly in and take an egg. The whole layered, symbiotic relationships between the birds is gone, and survivors are suffering as much as if their eggs were taken too.

This tremendous loss made me realize the significance of the Arctic Tern colony. It is the only one in Resurrection Bay; as far as I know, there are no Arctic Tern colonies to the south. The next tern colony at Tern Lake, mile 38 Seward Highway, has only 6 pairs. The colony at Potter Marsh south of Anchorage is much diminished.

It would be interesting and important to compile data on the Arctic Tern populations on the Kenai Peninsula and southcentral. If anyone has data, please share it with me at c_griz@yahoo.com.

This colony is also threatened by proposed expansion of the Alaska Railroad including a possible jetty at the edge of their colony, creation of a barge basin by dredging the immediately adjacent wetlands, a possible extension of Port Avenue to connect with Airport Road, among other significant habitat impacts. Visit the Railport Seward expansion plan at < http://www.railportseward.com/about/project-overview>

The Seward Airport is also considering widening and extending the NS runway 13-31 farther south, pointing directly at the tern colony, and placing them in the path of descending and ascending airplanes. The impact of these changes on a regionally significant Arctic Tern colony will be drastic. < http://dot.state.ak.us/creg/sewardairport/>

I filed a report with the US Fish and Wildlife Service and an investigation is underway. Seward is a closed area for subsistence harvest. It is illegal for anyone, including Alaska Natives, to harvest wild bird eggs on the road system in the Kenai Peninsula.

The 2016 Alaska Subsistence Spring/Summer Migratory Bird Harvest Regulation is available on line at
< http://www.fws.gov/alaska/ambcc/Regs/16%20Regs%20Book-3-11-16_web.pdf>

Very sad birder,
Carol Griswold
Seward Sporadic Bird Report Reporter
For a photo, please visit my blog at < http://sporadicbird.blogspot.com/>

From: Carla SlatonBarker <Carla@solsticeak.com>
To: 'rainyday' <c_griz@yahoo.com>
Cc: Robin@solsticeak.com
Sent: Friday, April 29, 2016 8:38 AM
Subject: RE: Seward Airport high tide photos

Hi Carol,
Thanks so much for your comments and the photos (wow, what a view!). We'll share them with the project team and add them to the comment record.
Thanks for taking the time, and it was nice speaking with you in Seward last week.
Carla

Carla SlatonBarker
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, Alaska 99503
907.929.5960

From: rainyday [mailto:c_griz@yahoo.com]
Sent: Wednesday, April 27, 2016 9:08 PM

To: Carla@solsticeak.com; Robin@solsticeak.com
Subject: Seward Airport high tide photos

Hi Carla and Robin,

Attached are some photos of the Seward Airport taken on March 10, 2016 near the high tide of day of 11.9'. As you know, this is not the highest tide, which can reach 13.7'.

I am very concerned that closing main Runway 13-31 will indeed allow floodwater to have better access to the existing floodplain as stated. This is not a reasonable or desirable direction. I fear that without maintaining the main runway as a levee, the floodwater will quickly overrun it and flow into the center portion of the airport. Then the river will start eroding the other runway 16-34 in the same way as it does now. That brings the impact of flood damage very close to the existing infrastructure of hangars, buildings, and Airport Road, resulting in an extremely expensive alternative.

I understand Dieckgraeff Road aka Levee Road, just across the highway from the airport, was designed and constructed in a flood plain. Similarly, raising the elevation, adding armor protection, and reconstructing Runway 13-31as a protective levee/runway is a superior alternative to closing Runway 13-31 and improving Runway 16-34.

This project must also consider the impending sea level rise in which the high tide shown in my photo may become the normal scenario for a moderate to low tide. The protective beach berm, reduced to an island, may be submerged more frequently, resulting in reduced protection from storm erosion.

The next protective barrier is the former road to the Naval Radio Station. It is submerged at high tides now. Close mowing along this former road reduces the ability of plants to maintain their roots, and thus their function to control erosion. The Airport Plan should include restrictions on mowing along this former road.

Note that the Alaska Railroad Master Plan proposes dredging for a boat barge basin between the airport and the AKRR property. This wetlands, with its layers of stable clay and compacted silt is very important for reducing flood impacts by controlling and filtering both flood waters and high tides. Removal of this stable wetlands, which includes a salmon stream complex, will bring the ocean permanently to the airport property line.

Extending Runway 13-31 will bring it extremely close to this property line, proposed boat barge basin, and ocean impacts. Consider the high costs of construction in wetlands, raising the elevation, and adding protective armoring for this alternative. Consider too, the negative impacts to wildlife and the environment.

Historic photos show the wild glacial Resurrection River created the entire alluvial fan from one side of the bay to the other. Artificial fill has extended development from the AKRR yard to the boat harbor, highway, and Lagoon. Allowing the river to have "better access to the existing floodplain" means utter destruction of all the infrastructure now in this floodplain.

I believe the most cost-effective and viable alternative is to maintain and improve existing Runway 13-31 as a levee/runway, and maintain the rest of the current infrastructure.

Thank you for your consideration,
Carol Griswold
Seward, Alaska

Subject: Seward Airport Improvements feedback

From: ej23345@gmail.com

To: solsticeak@solsticeak.com

Thu, 12 May 2016 13:22:21 -0800 (AKDT)

comments2	Seward Airport Improvement Project
name	Emily Johnson
satisfied	do not add to list
comments	Hello,I relocated to Seward a year ago, but in that time I have come to realize the importance of the airport, pond, and the mudflats beyond that for various bird species during different seasons. Spring is an especially important time for birds at the airport for shorebirds, Arctic Terns (they have a nesting colony there), heavy bodied birds such as geese, and many more. Two of the proposals would extend the runways into the pond or mudflats. This would be very detrimental for many bird species that migrate through this area. Though this is not a major stopover site for migrating birds, it is the only stopover site on this fjord before birds can head up through the Resurrection River. If the weather is bad, birds need a place to stop and refuel before they move on when the weather is better. Extending runway 16/34 would eliminate this critical area and birds would be forced to move on without refueling. Often when birds' stopover sites are destroyed! , the birds fly to exhaustion and have to stop in areas where they may not be able to find food. The result of this is often death. The importance of the airport pond and mudflats also lies in the fact that the water is brackish and has little silt. This allows for a greater diversity of food sources, thus a greater diversity of species are able to stop there and forage.Though I do not agree with any of the proposals for runway extensions, if I had to choose I would pick alternative 1.1. Alternative 1.1 does the least damage to this important and diverse habitat.I urge you all to consider not just the impacts on the people of Seward and the surrounding property owners, but also to the wildlife that utilizes this area and what the loss of this wildlife and habitat could mean. The loss of one stopover site for migrating birds may seem small, but the changes in migration patterns and survival rates during migration would be enormous.Thank you for your time and for considering ! my comments.-Emily Johnson
zipcode	28211
comments1	
email	ej23345@gmail.com

Your Comments

Please share your thoughts and ideas below regarding information presented at this meeting (challenges, solutions, alternatives, advantages or disadvantages of alternatives) or the project in general. Place this sheet in the comment box or submit your thoughts later (by May 13, 2016, please) to the address below.

Name (optional): Bob Linville

Address (optional): PO Box 1753, Seward, AK 99664

I support Alternative 1.1. Reasons below:

1. Accommodates existing use by larger aircraft.
2. Cost estimate much less than Alternative 3.
3. Does not impact barge basin expansion by ARRC.
4. Less impact to existing wetlands.
5. Its an existing facility that provides the longest runway of any alternative and does not require extension into Resurrection Bay storm impact zone.
6. Properties as shown as impacted across from current river channel are already flooded and unused.
7. Our whole valley is a flood zone to some degree. We need to hold the line and not lose more ground.

Please provide your comment today or send written comment (by May 13, 2016, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com

Subject: interest in the Seward Airport Improvements Project

From: laura.noland@cardno.com

To: solsticeak@solsticeak.com

Tue, 05 Jan 2016 15:56:13 -0900 (AKST)

email	laura.noland@cardno.com

Your Comments

The Seward Airport Improvements Project is just getting underway. The project team is gathering information about the Seward Airport, including needs, issues, and concerns. Your comments, questions, and issues are an important part of the process. Please share your thoughts and ideas below and place this sheet in the comment box. You can also submit your thoughts later (by September 26, 2014, please) to the address below.

Name (optional): Jim Hunt (occupation: City Manager Seward)

Address (optional): P.O. Box 3094

Beyond the fact the Resurrection/Salmon Rivers need major dredging: The key factor for erosion against and under the runway is the rivers migration/braiding to the west and as gravel and silt deposits filled the original bed. I don't believe any work should be done until the river's threat is mitigated. It also has caused issues for the Alaska Rail Road dock and future barge development area. I have large photographs (aerial) of the river's deposits over the area at my disposal. Thank you,

Jim

Please provide your comment today or send written comment (by September 26, 2014, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com.

* Emailed on 9/26/14 to Solstice Alaska Consulting

September 26, 2014

Robin Reich
Public Involvement Coordinator
Solstice Alaska Consulting, Inc.
2607 Fairbanks St, Ste B
Anchorage, AK 99503

Re: Seward Airport Improvements Project Comments

Dear Ms Reich:

I attended the public meeting held here in Seward at the Ray Building two weeks ago. As a local resident of Seward and a very frequent user of the wetlands and beach just to the south of the Seward Airport, I was greatly disturbed to learn that no provision for public access to this area was contemplated at this early stage of the project. I came away with the understanding that the beach/wetlands area will be fenced off with no gate to be included for public access. Is this correct? If so, I would like to be informed of the reasoning behind the need for public exclusion. This area has been consistently and heavily used by locals for many decades without any airport conflicts whatsoever. The actual runway/taxiway/tiedown/hangar area can be fenced and held to limited access to protect all airport operations if this is a federal requirement, as I recall hearing at the meeting. But somewhere in the vicinity of the current parking area at the end of the airport road there either needs to be a gate for public access to the beach/wetland area to the south or the fencing needs be designed such that public access is maintained. Public access to trails and wetlands exists in equally close proximity in many other Alaskan towns including Anchorage and Seward's need for the same is not at all uncommon. Seward is unique in that due to the Alaska Railroad, the only way to get to this beautiful area right close to town is either through airport or railroad property. As such, and in cooperation with the railroad if necessary, please begin discussions as to how our current access can be preserved as you go forward with this plan.

I look forward participating in this planning process as the design moves forward to completion. Thank you for the opportunity to comment at this time.

Sincerely,

Robert G Linville
PO Box1753
Seward, AK 99664
907-224-3252
linville@ak.net

Your Comments

The Seward Airport Improvements Project is just getting underway. The project team is gathering information about the Seward Airport, including needs, issues, and concerns. Your comments, questions, and issues are an important part of the process. Please share your thoughts and ideas below and place this sheet in the comment box. You can also submit your thoughts later (by September 26, 2014, please) to the address below.

Name (optional): Lucky H. Wilson

Address (optional): PO Box 685 Seward, AK 99664

My hanger is at 2102 Airport Rd. It is a Commerical Company BLD. The original plan was to supply a hanger large enough for large A/C, the current situation has destroyed that. My belief is to bring the current A/P up to pare with all other A/P in Ak, we need a float pond next to the long Runway like Kenai has, a long Runway with an IFR Approach & the short runway a GPS approach straight in over the bay. When the Alaska Village Fleet moves in the traffic will increase, an FBO with flts to Anc. (scheduled flts), the increase in Coast Guard TRAFFIC & Medical Flts make these items mandatory. Thank you, Lucky Wilson

Please provide your comment today or send written comment (by September 26, 2014, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com.

Your Comments

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Name (optional): Dennis Perry

Address (optional): PO Box 1802, Seward 99664

- Please make power availability more affordable. Industry avoids Seward because of it.
- Extend short runway to establish "usable" ILS or GPS approach with "missed approach" route up the valley
- Establish a float pond for float plane.

Please provide your comment today or send written comment (by September 26, 2014, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com.

Your Comments

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Name (optional): Peggy

Address (optional):

I live in Seward & have for the past 20 years-
We need to be able to have planes that can deliver
emergency equipment - personnel etc — We can't
support the huge number of visitors we have in the
summer months without knowing there is back up
help available - We don't need an international air port
but we do need something - and sooner than 2019!
Please consider an "interim" fix of the current
situation — We appreciate all your efforts and
thank you! Give us a chance to make Seward a
"Safe" place to live! :) Thanks!

Please provide your comment today or send written comment (by September 26, 2014, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com.

Your Comments

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Name (optional): WALTER CORRIGAN

Address (optional): PO BOX 770, SEWARD, AK

IN ADDITION TO THE UPGRADES TO THE RUNWAYS / TAXIWAYS / RAMP AREAS, IT WOULD BE GOOD TO HAVE SUFFICIENT SPACE FOR 20-30 T-HANGARS FOR RESIDENT AIRCRAFT. SUCH SPACE COULD BE LEASED BY THE STATE TO ENTITIES WHO WOULD BUILD AND MANAGE THEM. IMPROVEMENTS TO THE NAVIGATIONAL AIDS THAT I WOULD LIKE TO SEE WOULD BE:

1. WAAS (GPS WIDE-AREA AUGMENTATION SYSTEM)
2. ADS-B (AUTOMATIC DEPENDENT SURVEILLANCE-BROADCAST) TOWER.

BOTH WOULD ENHANCE SAFETY AS WOULD CITY WATER (WITH FIRE HYDRANTS) AND SEWAR ON THE PROPERTY

Please provide your comment today or send written comment (by September 26, 2014, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com.

Your Comments

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Name (optional): Pilot

Address (optional):

~~[illegible]~~

- Extend 1-6 South for ILS approach
- Do not raise taxi ways because I don't very important want my hangar in a hole. Okay to raise runway just not taxi way!!!
- Dredge the mouth of river every year
- The cross taxi way holds the water back. Needs to be removed. It is seldom used. This was a poor plan to build the cross taxi way and a waste of funds.

Please provide your comment today or send written comment (by September 26, 2014, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com.

Your Comments

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Name (optional): RONN HEMSTOCK

Address (optional): BOX 2976 SWD

DONT WANT ANY PLAN THAT REMOVES A RUNWAY

WINTER WINDS NESSITATE 31

AND SUMMER WINDS 16

A FLOAT POND WOULD BE A BIG IMPROVEMENT

Please provide your comment today or send written comment (by September 26, 2014, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com.

Your Comments

The Seward Airport Improvements Project is just getting underway. The project team is gathering information about the Seward Airport, including needs, issues, and concerns. Your comments, questions, and issues are an important part of the process. Please share your thoughts and ideas below and place this sheet in the comment box. You can also submit your thoughts later (by September 26, 2014, please) to the address below.

Name (optional): Jeff

Address (optional):

1) The Resurrection River needs to be dredged from the drop off to the deeps to the Bridges on Nash Rd and Seward Hwy.
2) The materials dredged need to be prudently placed behind riprap in a plan allowing For Future uses, Harbor protection from Flood filling, and Runway expansion. Reestablish the original airport Rd. and possibly an eastside road. Dredging Happens in Anchorage every Few years and there are Smaller Units are available for Upstream dredging,

Please provide your comment today or send written comment (by September 26, 2014, please) to Robin Reich, Public Involvement Coordinator, Solstice Alaska Consulting, Inc., 2607 Fairbanks Street, Suite B, Anchorage, Alaska 99503 or via email to solsticeak@solsticeak.com.

12 Sept 2014

Dear Mr Robin Reich,

Ref "Seward Airport Improvements Project #54857", could you send me a paper with sort of an overview of the project. I don't want anything in great detail, just an overview, I have land near the end of the runway.

Your consideration will be appreciated.

Trask

Ace F Trask
CAPT, USN (RET)

Ace F Trask
PO Box 564
Sequim WA 98382-0564

APPENDIX C2

Stakeholder Working Group Meetings

Table of Contents

Robin Reich

From: Robin Reich <robin@solsticeak.com>
Sent: Thursday, October 9, 2014 12:05 PM
To: 'alaskaba@live.com'
Cc: Beaton, Barbara J (DOT) (barbara.beaton@alaska.gov); Royce Conlon (RoyceConlon@pdceng.com); carla@solsticeak.com
Subject: Seward Airport Improvements Project: Stakeholder Working Group
Attachments: SWGWelcomePacketAnderson.pdf

Mr. Anderson-

Attached to this email is a letter from the Alaska Department of Transportation and Public Facilities formally inviting you to become a member of the Seward Airport Improvements Project Stakeholder Working Group. (A hard copy of the letter has been mailed.) Please feel free to call or email if you have questions. We look forward to seeing you soon.

Thank you.

Robin Reich
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, AK 99503
907.929.5960
907.903.0597 (mobile)

www.solsticeak.com

Robin Reich

From: Robin Reich <robin@solsticeak.com>
Sent: Thursday, October 9, 2014 12:12 PM
To: 'mike.edelmann@faa.gov'
Cc: Beaton, Barbara J (DOT) (barbara.beaton@alaska.gov); Royce Conlon (RoyceConlon@pdceng.com); carla@solsticeak.com
Subject: Seward Airport Improvements Project: Stakeholder Working Group
Attachments: SWGWelcomePacketEdelmann.pdf

Mr. Edelmann-

As requested by Barb Beaton at Alaska Department of Transportation and Public Facilities, I am emailing you a formal invitation to become a member of the Seward Airport Improvements Project Stakeholder Working Group. (A hard copy of the letter has been mailed.) Please feel free to call or email Barb if you have questions. We look forward to seeing you soon.

Thank you.

Robin Reich
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, AK 99503
907.929.5960
907.903.0597 (mobile)

SOLSTICE
alaska consulting inc

www.solsticeak.com

Robin Reich

From: Robin Reich <robin@solsticeak.com>
Sent: Thursday, October 9, 2014 12:30 PM
To: 'jhunt@cityofseward.net'
Cc: Beaton, Barbara J (DOT) (barbara.beaton@alaska.gov); Royce Conlon (RoyceConlon@pdceng.com); carla@solsticeak.com
Subject: Seward Airport Improvements Project: Stakeholder Working Group
Attachments: SWGWelcomePacketHunt.pdf

Mr. Hunt-

Attached to this email is a letter from the Alaska Department of Transportation and Public Facilities formally inviting you to delegate two people to become members of the Seward Airport Improvements Project Stakeholder Working Group. The Department requests that the City's representatives be one person from the planning department and another person who is an elected official (or a designee of elected officials). (A hard copy of the letter has been mailed.) Please feel free to call or email if you have questions. We look forward to seeing the City's representatives soon.

Thank you.

Robin Reich
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, AK 99503
907.929.5960
907.903.0597 (mobile)

www.solsticeak.com

Robin Reich

From: Robin Reich <robin@solsticeak.com>
Sent: Thursday, October 9, 2014 12:16 PM
To: 'kubitzj@akrr.com'
Cc: Beaton, Barbara J (DOT) (barbara.beaton@alaska.gov); Royce Conlon (RoyceConlon@pdceng.com); carla@solsticeak.com
Subject: Seward Airport Improvements Project: Stakeholder Working Group
Attachments: SWGWelcomePacketKubitz.pdf

Mr. Kubitz -

Attached to this email is a letter from the Alaska Department of Transportation and Public Facilities formally inviting you or your designee to become a member of the Seward Airport Improvements Project Stakeholder Working Group. (A hard copy of the letter has been mailed.) Please feel free to call or email if you have questions. We look forward to seeing you soon.

Thank you.

Robin Reich
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, AK 99503
907.929.5960
907.903.0597 (mobile)

www.solsticeak.com

Robin Reich

From: Robin Reich <robin@solsticeak.com>
Sent: Thursday, October 9, 2014 12:18 PM
To: 'dmahalak@borough.kenai.ak.us'
Cc: Beaton, Barbara J (DOT) (barbara.beaton@alaska.gov); Royce Conlon (RoyceConlon@pdceng.com); carla@solsticeak.com
Subject: Seward Airport Improvements Project: Stakeholder Working Group
Attachments: SWGWelcomePacketMahalak.pdf

Mr. Mahalak-

Attached to this email is a letter from the Alaska Department of Transportation and Public Facilities formally inviting you to become a member of the Seward Airport Improvements Project Stakeholder Working Group. (A hard copy of the letter has been mailed.) Please feel free to call or email if you have questions. We look forward to seeing you soon.

Thank you.

Robin Reich
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, AK 99503
907.929.5960
907.903.0597 (mobile)

SOLSTICE alaska consulting inc

www.solsticeak.com

Robin Reich

From: Robin Reich <robin@solsticeak.com>
Sent: Thursday, October 9, 2014 12:22 PM
To: 'sean.montgomery@alaska.gov'
Cc: Beaton, Barbara J (DOT) (barbara.beaton@alaska.gov); Royce Conlon (RoyceConlon@pdceng.com); carla@solsticeak.com
Subject: Seward Airport Improvements Project: Stakeholder Working Group
Attachments: SWGWelcomePacketMontgomery.pdf

Mr. Montgomery-

As requested by Barb Beaton at Alaska Department of Transportation and Public Facilities, I am emailing you a formal invitation to become a member of the Seward Airport Improvements Project Stakeholder Working Group. (A hard copy of the letter has been mailed.) Please feel free to call or email Barb if you have questions. We look forward to seeing you soon.

Thank you.

Robin Reich
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, AK 99503
907.929.5960
907.903.0597 (mobile)

www.solsticeak.com

Robin Reich

From:	Robin Reich <robin@solsticeak.com>
Sent:	Thursday, October 9, 2014 12:20 PM
To:	'bearlakepilot@gmail.com'; 'iscream4me@gmail.com'
Cc:	Beaton, Barbara J (DOT) (barbara.beaton@alaska.gov); Royce Conlon (RoyceConlon@pdceng.com); carla@solsticeak.com
Subject:	Seward Airport Improvements Project: Stakeholder Working Group
Attachments:	SWGWelcomePacketPerry.pdf

Mr. Perry-

Attached to this email is a letter from the Alaska Department of Transportation and Public Facilities formally inviting you to become a member of the Seward Airport Improvements Project Stakeholder Working Group. (A hard copy of the letter has been mailed.) Please feel free to call or email if you have questions. We look forward to seeing you soon.

Thank you.

Robin Reich
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, AK 99503
907.929.5960
907.903.0597 (mobile)

www.solsticeak.com

THE STATE *of* ALASKA

GOVERNOR SEAN PARNELL

Department of Transportation and Public Facilities

DESIGN & ENGINEERING SERVICES
Central Region Aviation Design

PO Box 196900
Anchorage, Alaska 99519-6900
Phone: 907.269.0617
Toll Free: 800.770.5263
TDD: 907.269.0473
TTY: 800.770.8973
Fax: 907.243-4409.

October 8, 2014

Alaska Wing Civil Air Patrol
Brandon Anderson
PO Box 6014
Elmendorf AFB, AK 99506

Subject: Seward Airport Improvements Project: Stakeholder Working Group

Dear Mr. Anderson:

The Alaska Department of Transportation and Public Facilities (DOT&PF), in association with the Federal Aviation Administration (FAA), is proposing to improve the Seward Airport. The project's primary purpose is to make improvements that will substantially reduce further damage to airport facilities caused by the frequent flooding of the Resurrection River. The proposed project will also include runway/taxiway reconstruction, pavement rehabilitation, new airport lighting and an electrical enclosure building, new navigational aids, additional fencing, and erosion control/armor protection.

To maintain regular communication between the project team and key members of the public, we are forming a Stakeholder Working Group (SWG). On behalf of the DOT&PF, I would like to formally invite you to become a member of the SWG.

To help you get acquainted with the purpose of the Stakeholder Working Group, enclosed are a Stakeholder Working Group Roles sheet and a group membership list. Once the group is formed we will provide a more detailed schedule of SWG meetings. In general, we anticipate monthly communication in these forms: in-person meetings in Seward, teleconference meetings, or individual data-gathering conversations by phone or in person.

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We appreciate your participation in your role as active listener, thoughtful commentator, and personal bridge between the project and your organization, neighbors, co-workers, family, and

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Sincerely,

Barbara J. Beaton, P.E.
Project Manager, DOT&PF

cc: Royce Conlon, P.E., Project Manager, PDC Inc. Engineers
Robin Reich and Carla SlatonBarker, Solstice Alaska Consulting

Enclosures: Stakeholder Working Group Roles, Stakeholder Working Group Membership List

Roles of the Stakeholder Working Group

What is the Seward Airport Improvements Project Stakeholder Working Group?

- The Stakeholder Working Group is comprised of people who meet regularly to discuss the project.
- People selected to serve on the working group reflect a cross section of potential issues and constraints that this project will need to address—from airport use, to funding, to environmental considerations. A diversity of viewpoints will ensure full discussion of project issues and needs.
- The working group will receive briefings and detailed information to allow discussion based on best available information.
- The working group will provide a sounding board for ideas and strategies to solve problems.
- Working group input is important and can affect the project outcome.

What is the role of the participant in the Stakeholder Working Group?

- Attend meetings to understand the full breadth of the problems to be solved.
- Be an active listener—listening to the project team and to other working group participants.
- Ask lots of questions to gain an understanding of the process, the airport, and any considerations presented.
- Share ideas based on your individual knowledge and experience. Your role in the community, as an airport user, agency representative, elected official, or resident will be reflected in your preferences and opinions.
- Discuss the project with neighbors, co-workers, friends, and business associates and share insights from these conversations with the project team.

What is the role of the Project Team in the Stakeholder Working Group?

- Inform the working group about the process.
- Inform the working group about the project area—airport operations, airport standards, and funding, as well as environmental considerations like floodplains, fish habitat, and wetlands.
- Provide technical expertise to help the working group understand various strategies to solve problems.
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Who will make the final decisions for the study?

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Seward Airport Improvements Project
Stakeholder Working Group (SWG) Membership

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Fax: 907.243-4409

October 8, 2014

Mike Edelmann
Federal Aviation Administration, Alaska Region (AAL-618)
222 W. 7th Ave, M/S #14
Anchorage, AK 99513-7587

Subject: Seward Airport Improvements Project: Stakeholder Working Group

Dear Mr. Edelmann:

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October 8, 2014

City of Seward
Jim Hunt
PO Box 167
Seward, AK 99664

Subject: Seward Airport Improvements Project: Stakeholder Working Group

Dear Mr. Hunt:

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To maintain regular communication between the project team and key members of the public, we are forming a Stakeholder Working Group (SWG). On behalf of the DOT&PF, I would like to formally invite the City of Seward's participation on the SWG and ask that you designate two people to become members of the group: one person from the planning department and another person who is an elected official (or their designee).

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Roles of the Stakeholder Working Group

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October 8, 2014

Jim Kubitz
Alaska Railroad Corporation
PO Box 107500
Anchorage, AK 99510-7500

Subject: Seward Airport Improvements Project: Stakeholder Working Group

Dear Mr. Kubitz:

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October 8, 2014

Kenai Peninsula Borough
Dan Mahalak
PO Box 2646
Seward, AK 99664

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Sincerely,

Barbara J. Beaton, P.E.
Project Manager, DOT&PF

cc: Royce Conlon, P.E., Project Manager, PDC Inc. Engineers
Robin Reich and Carla SlatonBarker, Solstice Alaska Consulting

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GOVERNOR SEAN PARNELL

Department of Transportation
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DESIGN & ENGINEERING SERVICES
Central Region Aviation Design

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Toll Free: 800.770.5263
TDD: 907.269.0473
TTY: 800.770.8973
Fax: 907.243-4409.

October 8, 2014

DOT&PF Maintenance
Sean Montgomery
PO Box 1327
Soldotna, AK 99669

Subject: Seward Airport Improvements Project: Stakeholder Working Group

Dear Mr. Montgomery:

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Meeting Agenda and Overview

Meeting #1 Objectives (Our Work Today)

- Form and clarify the work of Stakeholder Working Group (SWG).
- Establish consensus on problem and project needs.
- Present the draft "Aviation Activity & Facility Requirements" technical memorandum (provided in advance) and ensure that SWG members understand findings and have an opportunity to provide input.
- Learn from and incorporate SWG information and perspectives into project documents.

Meeting #1 Goals (Meeting's End Result)

- SWG understanding of the project, the process, and SWG role.
- SWG agreement with the draft "Aviation Activity & Facility Requirements" report (support for the methodology and findings) OR with specific action items to resolve document deficiencies.
- SWG introduction to project options and constraints.

Meeting Agenda (Topic and Timeline)

Part 1: Getting Started (11:30 am to 12:00 pm)

- Welcome, Introductions, Role of the SWG, Meeting Overview (Carla SlatonBarker, Solstice Alaska Consulting)
- Problem & Needs, Project Process, and SWG Input (Royce Conlon, P.E., PDC Inc. Engineers)

Part 2: Understanding the Draft "Aviation Activity & Facility Requirements" Report (12:00 to 12:30 pm)

- Draft Report Overview (Royce Conlon)
  - Why understanding the aviation activity is important
  - Steps, research, contacts, current forecasts, findings—do we have any gaps?
  - Facility requirements
- Constraints Discussed (Royce Conlon)
  - Funding constraints: What does FAA need to consider the different facility requirements scenarios?

SHORT BREAK

Part 3: Visualizing Options and Constraints (12:35 to 1:15 pm)

- Actions and Options -- Discussion of What This All Means (Royce Conlon)
  - Floodplain constraints
  - Alaska Railroad plans
  - Design Options

Part 4: Next Steps and Needed Actions (1:15-1:30)

- Project Schedule and Milestones (Royce Conlon)

Adjourn (1:30) *Thank you for your time and participation!*

Visit the project on the web at: www.dot.state.ak.us/creg/sewardairport/

EXECUTIVE SUMMARY
Draft "Aviation Activity & Facility Requirements" Technical Memorandum

The draft "Aviation Activity & Facility Requirements" technical memorandum is a foundational planning document for the Seward Airport Improvements Project. It reports current and expected future aviation activity at the Seward Airport (SWD) in terms of type of aircraft and number of flights (operations). A design aircraft is selected by comparing this information with federal airport design guidance. The design aircraft corresponds to a runway design code, which determines the airport's dimensional requirements (runway width, length, offset from parked aircraft, etc.).

The draft technical memorandum reports that existing SWD air traffic activity includes single and twin-engine general aviation (GA) aircraft, medevac aircraft, military aircraft, and helicopters. The most demanding aircraft in steady use (largest wingspan and longest required runway length) is the King Air B200, which is used for medical evacuations. Existing airport facilities include two runways: Runway 13/31 (the main runway) is 4,533 feet long by 100 feet wide. Runway 16/34 (the crosswind runway) is 2,289 feet long by 75 feet wide.

The technical memorandum also reports expected future aircraft operations. In estimating the number of operations for each aircraft type, the technical memorandum considers many factors influencing Seward's future. The technical memorandum reports that there will be a modest increase to aviation activity at SWD as a result of the factors considered. This projection of a "modest increase" results in the following conclusions that are reported in the technical memorandum:

- The aircraft based at Seward are similar in design characteristics and could be served by an airport designed to the standards for Aircraft Design Group (ADG) I, Approach Category A, with a runway length of 3,300 feet (see table below, Scenario 1).

- Seward has a demonstrated special need for the medevac aircraft (Beech B-200) used by three of the air ambulance companies serving Seward. If the Beech 200 is used as the critical design aircraft, the airport design standards increase to ADG II. See Scenario 2 in the table below.

- Pilots and local officials expressed the desire for a runway that can accommodate small charter jets for tourism, emergency preparedness, and search and rescue aircraft such as the Coast Guard C-130, and for potential scheduled air service. Scenario 3 in the table represents the facility dimensions required to meet this desire.

Runway Dimensional Standards for Various Scenarios

Feature	Current Based Aircraft Group (Scenario 1)	Current Demand & Medevac (Beech 200) (Scenario 2)	Growth Scenario & Emergency Preparedness (Beech 1900) (Scenario 3)	Existing (R/W 13/31)
Approach Category	A	B	B	B
ADG	I	II	II	II
Runway Length	3,300 feet	3,300 feet	4,000/4,700 feet *	4,533 feet
Runway Width	60 feet	75 feet	75 feet	100 feet

* The FAA runway length guidance is changing. If the design aircraft is over 12,500 pounds but less than 60,000 pounds, the current guidance calls for a 4,700' runway length to meet the needs of a group of aircraft in that weight range. The new guidance (draft) calls for runway lengths to be determined using the airplane manufacturer's airport planning manuals. The runway length of 4000' is sufficient for the Beech 1900, if it is selected as the design aircraft.

Because project funding is being provided predominately (93.75%) by the federal government through the Federal Aviation Administration (FAA), the key to the viability of any of these scenarios is the adherence with federal guidance and the availability of federal funding. Federally funded projects require that the critical design aircraft (the most demanding aircraft) have at least 500 or more annual operations at the airport during the established planning period. According to the technical memorandum, this stipulation could affect SWD in the following ways:

- The C-130 and small charter jets are not anticipated to meet the federal threshold of regular use. These aircraft, however, have used Seward in the past and owners continue to desire the ability to land. Anecdotal information indicates that up to 20 small charter jets per year have landed at Seward in the past.

- Although medevac aircraft provide a critical service to the community, they also do not meet the FAA threshold of 500. Medevac aircraft can and do operate on runways throughout Alaska that have been designed for smaller aircraft.

Additional data or information (beyond what is reported in this technical memorandum) is needed to consider use of federal funds for any scenario involving a runway length greater than 3,300 feet.

###

Transforming Challenges into Solutions

PDC INC. ENGINEERS

TECHNICAL MEMORANDUM

For:	Barbara Beaton, Aviation Project Manager Alaska Department of Transportation and Public Facilities	**Date**	November 12, 2014
Client #/PDC #	54857/14075FB	**Prepared by**	Ken Risse, PE; Patrick Cotter, AICP; Royce Conlon, PE
Project Name	Seward Airport Improvements	**Reviewed by**	Royce Conlon, PE
Subject	***Draft Aviation Activity & Facility Requirements***		

This technical memorandum presents the aviation demand forecast effort and resulting facility requirements. The facility requirements set the stage for development of design alternatives by establishing the runway design code, which determines the airport's dimensional requirements (runway width, length, offset from parked aircraft, etc.).

This technical memo represents an interim review document. Once reviewed and coordinated with DOT&PF, it will be incorporated into the scoping report.

In this memorandum we translate the aviation forecasts into facility requirements by comparing future facility needs to the airport's existing inventory of facilities, reviewing FAA design criteria to ensure the airport meets safety and operational standards, and considering the need to maintain and improve aviation service for the community of Seward.

This document is focused on key elements of the airport that will drive the alternative development and evaluation process, with brief discussion of other secondary facility elements. A more comprehensive analysis will be presented in the scoping report.

Aviation Activity

Forecasts of future levels of aviation activity are the basis for making decisions in airport planning and development. A comprehensive forecast includes elements of socioeconomics, demographics, geography, and external factors. Recent interest in Seward by the fishing and marine industries has sparked anticipation of growing industrial development in the community.

The methodology used in this analysis is based on the process recommended in FAA AC 150/5070-6B, *Airport Master Plans*, and in the supplemental FAA publication, *Forecasting Aviation Activity by Airport*. These documents provide national guidance for the development of airport master plans and have been used since enactment of the Airport and Air/Ways Development Act of 1970.

Recommended steps include:

- Step 1 – Identify aviation activity measures
- Step 2 – Collect and review previous airport forecasts
- Step 3 – Gather data
- Step 4 – Select forecast methods
- Step 5 – Apply forecast methods and evaluate results
- Step 6 – Compare forecast with Terminal Area Forecast (TAF)

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Step 1 – Identify Aviation Activity Parameters and Measures to Forecast

The level and type of aviation activity anticipated at an airport, as well as the nature of the planning to be done, determine the factors to be forecast. Generally, the most important activities for airfield planning are **aircraft operations** and the **fleet mix**, since these define the runway and taxiway requirements. Plans for general aviation airports require forecasts of aircraft operations and based aircraft to define runway, taxiway, and aircraft parking requirements.

Practical considerations dictate the level of detail and effort that should go into an airport planning forecast. Air traffic activity at Seward comprises single and twin-engine GA aircraft, medevac aircraft, military aircraft, and helicopters. Because this project centers on runway improvements, the forecast for Seward Airport will focus on:

- Aircraft operations
- Based aircraft
- Fleet mix

Step 2 – Collect and Review Previous Airport Forecasts

Relevant forecasts of aviation activity at Seward are summarized below.

Seward Airport Master Plan (2008)

In 2008, the DOT&PF updated the Seward Airport Master Plan. This update forecasted aircraft operations and passenger enplanements as summarized in the following table. An annual growth rate of 1.2% was used to forecast future operations, enplanements, and cargo.

Table 1 - 2008 Seward Airport Master Plan Aviation Forecast, Moderate Growth Scenario

	2003 (Base)	2008	2013	2018	2023
Enplanements	3,746	3,976	4,221	4,480	4,755
Commercial Operations	2,912	3,091	3,281	3,483	3,697
GA Operations	2,475	2,627	2,789	2,960	3,142
Military Operations	75	—	—	—	—
Cargo (lbs)	4,000	4,416	4,876	5,383	5,944

Alaska Aviation System Plan (2008)

The Alaska Aviation System Plan (AASP) is a component of DOT&PF's Statewide Transportation Plan. Most recently updated in 2008, the AASP contains forecasts of enplanements, cargo, operations, and based aircraft for 2015, 2020, and 2030.

Table 2 - Alaska Aviation System Plan Forecast, Seward Airport

Seward	2008 (Base)	2015	2020	2030
Enplanements	22	23	25	29
Cargo	None	None	None	None
Critical Aircraft	Cessna 185			
Aircraft Operations				
Commercial	4,500	4,136	4,318	4,576
GA	6,000	5,932	6,211	7,133
Military	10	10	10	10
Total Operations	**10,510**	**10,178**	**10,539**	**11,719**
Based Aircraft				
Single engine	28	29	29	31
Multi-engine	0	0	0	0
Helicopter	0	0	0	0

FAA Terminal Area Forecast (TAF)

The FAA TAF for Seward Airport is summarized in Table 3. The TAF includes passenger enplanements, aircraft operations, and based aircraft.

Table 3 - FAA Terminal Area Forecast (2013) Seward Airport

Passenger Enplanements			Itinerant Aircraft Operations				Local GA Ops	Total Ops
Air Carrier	Commuter/ Air Taxi	Total	Air Carrier	Commuter/ Air Taxi	GA	Military		
0	9	9	0	4,500	4,000	10	2,000	10,510

The unusually low number of commuter/air taxi enplanements compared to the number of operations is likely due to the lack of scheduled commercial service to SWD. This means enplanements are not recorded in the T-100 database, which may account for the low number.

National Plan of Integrated Airport Systems (NPIAS)

The NPIAS presents a five-year forecast of enplaned passengers and based aircraft. The current NPIAS forecast for Seward (for the years 2013-2017, using 2011 as the base year) is presented in Table 4.

Table 4 - NPIAS Forecast Year 2017

Enplanements	8
Based Aircraft	25

Step 3 – Gather Data

The FAA requires master plan forecasts to incorporate the number of aircraft operations for various categories of aircraft. Passenger enplanement, cargo, mail, and freight data are also recommended, and the governing Advisory Circular (AC) specifies that population, employment rates, and socio-economic factors be included, as any of these can also affect the forecast.

Air traffic operations at Seward Airport are not recorded on site because there is no air traffic control tower. Historical air traffic data for Seward were collected from FAA's Airport Master Record Form 5010, the FAA TAF, the NPIAS, the USDOT Bureau of Transportation Statistics, and the AASP.

Data also came from interviews with airport users, potential airport users, medevac providers, and Seward-based industry.

Aviation activity at Seward is predominantly unscheduled general aviation and air taxi flights, with occasional medevac and military use. Scheduled passenger service was discontinued in 2002.

Passengers

Passenger traffic at Seward Airport (SWD) has remained low over the past decade. The USDOT T-100 database shows fewer than 30 passengers per year since 2004 (see Table 5).

Table 5 – Historic SWD Passenger Enplanements, 2004-2013

Year	Passengers
2004	20
2005	1
2006	7
2007	26
2008	22
2009	18
2010	9
2011	22
2012	8
2013	0

Freight and Mail

The USDOT T-100 data show no history of freight or mail passing through SWD.

Based Aircraft

The FAA Airport Master Record Form 5010 lists 25 single-engine aircraft based at SWD. This number concurs with previous forecasting efforts and interviews with airport users.

Aircraft Operations

There are two primary sources of aircraft operations for Seward Airport: the FAA's Form 5010, *Airport Master Record*, and the FAA Terminal Area Forecast. These data are presented in the table below.

Table 6 - Aircraft Operations

Source	Air Carrier	Air Taxi	GA Local	GA Itinerant	Military
Form 5010	0	4,500	2,000	4,000	10
TAF	0	4,500	2,000	4,000	10

Fleet Mix Table 7 lists the types and Aircraft Design Group (ADG) of aircraft that landed at SWD at least once during 2013.

Table 7 - Current (2013) Fleet Mix Using Seward Airport

Operator	Aircraft	ADG	Use
LifeMed	A-Star helicopter King Air B200	 II	Medevac
LifeFlight	King Air B200	II	Medevac
Guardian	King Air B200	II	Medevac
Scenic Mountain Air	Cessna 172	I	Flight seeing/air taxi
Seward Air	Super Cub PA-18	I	Personal
Private	Cessna 172 Super Cub PA-18	I I	Personal
Private	Cessna 170	I	Personal

US DOT T-100 data was acquired and reviewed (see attachment). This data documents use of the following aircraft between 2007 and 2012: Beech 1900 and 200, Cessna 172 Skyhawk, 208 Caravan, C206/207/209/210 Stationair; Pilatus PC-12; and Piper PA-32 (Cherokee 6). No flights for Seward were listed in the 2013 data.

The air carriers reporting the operations include Alaska Central Express, Era Aviation, Frontier Flying Service, Grant Aviation, Homer Air, Iliamna Air Service, Island Air Service, Smokey Bay Air, Warbelow Air Ventures, and Wright Air Service.

In addition to the above fleet mix, the U.S. Coast Guard uses SWD for search and rescue activities and also for pilot training for short field landings with the C-130 (an ADG IV aircraft). Helicopters used include the H-60 and H-65.

The Kenai Peninsula Aviation Superintendent provided a list of large aircraft that requested permission to land at Seward in 2013.

- Lear 35 (ADG C-I): 11 requests
- King Air 200 (ADG B-II): 16 requests
- Gulfstream 5(ADG C-III):4 requests
- DC-6 (ADG B-III): As needed

Step 4 – Select Forecast Methods

While there are several acceptable techniques and procedures for forecasting aviation activity at a specific airport, most forecasts utilize basic statistical techniques such as linear regression, exponential smoothing, or share analysis. To determine which method is most appropriate, it is important to look at factors affecting aviation demand. The following discussion is an overview of the factors affecting aviation demand at Seward and the forecast method applied.

Economic Activity An analysis of socioeconomic activity is usually helpful in developing a forecast of aviation demand. Projected increases in population or economic activity can lead to increased use of an airport.

The following section highlights major factors of socioeconomic growth in Seward. These include:

- Population forecasts
- Possible relocation of Coastal Villages Region Fund CDQ Fleet to Seward
- Vigor Industrial's purchase of Seward Drydock
- Tourism

Population

The population of Seward has grown steadily over the past 14 years (see Figure 1) to a current population of 2,754. The compound annual growth rate over this time period is 1.23%, which is higher than the Alaska Department of Labor and Workforce Development's projected growth for the Kenai Peninsula Borough of 0.5% (Alaska Department of Labor and Workforce Development, 2014).

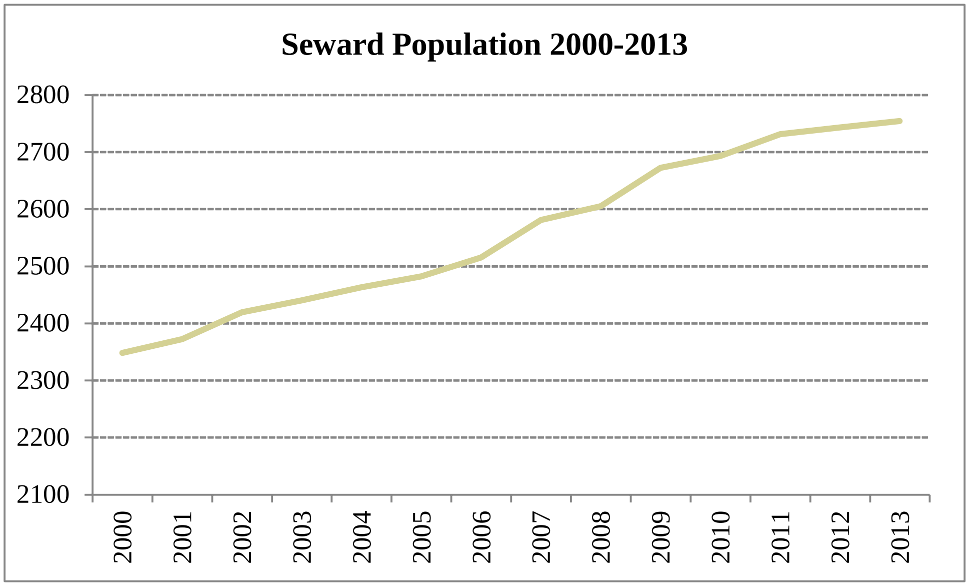


Figure 1 - Historic Seward Population, 2000-2013

Coastal Villages Region Fund CDQ Fleet

The Coastal Villages Region Fund (CVRF) represents 20 western Alaska communities in the Community Development Quota (CDQ) fishery. The CDQ's purpose is to:

- Provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area
- Support economic development in western Alaska
- Alleviate poverty and provide economic and social benefits for residents of western Alaska
- Achieve sustainable and diversified local economies in western Alaska

The City of Seward has been actively trying to homeport the CDQ fleet in Seward rather than Seattle. The CVRF has partnered with Seward to develop the Seward Marine Industrial Center (SMIC) support facilities. The SMIC will increase the available moorage, warehousing space, and upland areas to accommodate the CDQ fleet.

If the CVRF decides to homeport in Seward, the airport could see increased activity during spring deployment of the CDQ fleet when crews return to Seward. This could result in approximately 500 enplanements twice a year if crews flew into and out of Seward.

Vigor Industrial

In early 2014, Vigor Industrial announced the purchase of Seward Ship's Drydock. According to the press release, "the purchase will bring the strength of Vigor's physical, financial and human capital to bear on the yard, which will empower the yard to land more projects and larger-scale projects, translating to more work and sustainable employment for Alaska residents. In addition, Vigor will leverage its existing strong public/private partnerships in Alaska to maximize opportunities for the Seward yard."

If Vigor is able to bring additional work to Seward, there will likely be an increase in the shipment of supplies to Seward. However, due to the nature of industrial marine manufacturing, most supplies will likely be shipped via barge. This is not likely to increase the air transport operations at Seward Airport.

Tourism

Tourism is a major component of the economy of Seward. Cruise ships, railroad, and personal vehicles all bring tourists to the community. Attractions include Kenai Fjords National Park, the Alaska Sealife Center, Mount Marathon Race, and Exit Glacier. Tourist activities include flightseeing, sportfishing, hiking, wildlife cruises, and sled dog demonstrations.

Four cruise lines will serve Seward in 2015: Holland America, Celebrity, Regent, and Royal Caribbean. Cruise ships in port can nearly double the population of the community. Many cruisers embark or disembark a cruise in Seward with connections to/from Anchorage, Denali, and Fairbanks via buses or the Alaska Railroad. No increase from the current use is expected.

Flightseeing activities generally consist of small fixed-wing aircraft tours of the surrounding mountains, glaciers, and ocean. Typical aircraft are Cessna 172 or similar. No increase in tourism-related air traffic is anticipated.

Alaska Railroad (ARRC) Facility Improvements

The ARRC is planning a substantial investment and improvements in the port and rail facilities adjacent to the airport. During a coordination meeting, ARRC staff indicated that if the airport had regularly scheduled flights, ARRC would prefer to have its crews and management teams who occasionally commute to/from SWD fly versus traveling by rail or highway. Travel time and safety were the primary reasons cited. The specific number of enplanements this would equate to is undetermined.

Gas Line Construction

Seward experienced significant activity during the construction of the Trans-Alaska Pipeline in the 1970s. Most of the pipe was shipped through the port of Seward. During a project coordination meeting, ARRC staff predicted that if a new gas pipeline were constructed through Alaska, activity through the combined port/rail terminal would increase. This would also likely increase activity at the Seward Airport. This construction impact would be transitory, however. Short-term effects such as this normally do not drive long-term investment in airport facilities, especially if other (albeit less efficient) modes of transportation can meet the demand.

Medevac Operations

The term "medevac" is an abbreviation for medical evacuation. This and other terms referring to a type of medical emergency response are used interchangeably in the United States. Other terms include "helicopter emergency medical service" and "air ambulance." The value of air access to remote locations or in the event of an emergency is not generally recognized until it occurs and it is difficult to place an economic value on such capabilities. Oftentimes, the primary means of reaching a community immediately after a major act of nature such as a flood, earthquake, wildfire, or landslide is via air transport.

Both fixed wing and helicopters are used in medical emergency response situations. Patients are flown by fixed wing aircraft for many different reasons. These can range from the stable patient involved in an accident or with a long-term medical condition wishing to relocate closer to family for rehabilitative care, to the critical heart failure patient requiring intensive care transfer to receive a transplant. The fixed wing environment differs from the rotary wing environment primarily in that fixed wing aircraft travel farther, faster, and higher. The fixed wing aircraft is primarily a facility-to-facility transport and typically is used for long distance air transport and includes a range of multi-engine turboprop and small jet aircraft specially equipped and staffed to respond to patient needs while en route. Rotary wing service is typically engaged for moving a patient from an accident or incident scene to a trauma center and for air transport of stable patients and are also suitably staffed and equipped for these missions.

Not all medevac transport is associated with an emergency situation. Many involve medically appropriate, hospital-to-hospital transport on a scheduled basis. Therefore, medevac service providers are actively engaged in both emergency response and critical care transport.

Air transportation of patients between Seward and Anchorage is fairly common. Although Seward is connected to Anchorage via the highway system, the local volunteer ambulance service does not have enough staff to transport patients to Anchorage. Therefore, fixed-wing aircraft and helicopters are used for medevac transport.

Three medevac operators currently provide service to Seward: LifeFlight, LifeMed, and Guardian. LifeMed and Guardian are the most common medevac operators at SWD, with approximately 300 annual operations combined.

Table 8 - Medevac Operations at SWD

Medevac Operator	Aircraft	Estimated Annual Operations
LifeMed	King Air B200[1]	60
LifeMed	A-Star Helicopter	140
Guardian	King Air B200	100
LifeFlight	King Air B200	40

LifeMed and Guardian also utilize Lear Jets for medevacs. Those aircraft require 5,000 feet of runway length and are therefore not used at SWD. Discussions with medevac operators, however, did indicate that Lear Jets based in Anchorage would be utilized for approximately half of the medevacs if the runway were longer and the instrument approach were better.

[1] The King Air B200 is a fixed-wing aircraft

Commuter Travel

Seward has not had scheduled air service since 2002. Recent contact with Alaska Airlines and RAVN Alaska, the two air operators most likely to offer commuter service, indicate they have no plans (within the foreseeable future) to offer scheduled service. When asked what would trigger the addition of SWD to their schedule, RAVN replied demand and a better approach to ensure they could offer reliable service.

RAVN does provide charter service to SWD, generally in support of the cruise ship industry. Also, RAVN provides scheduled service to Kenai Municipal Airport. A brief analysis was conducted to compare and contrast Seward with Homer and Kenai to evaluate potential for future air service to SWD.

Table 9 – Comparison with Homer and Kenai

Community	Airport	Population	Distance/Drive Time	Commercial Flights
Seward (+ Moose Pass)	SWD	5,775	127 miles/2.5 hours	0
Kenai (+ surrounding contributing communities)	ENA	33,489	157 miles/3.25 hours	10 daily
Homer (+ surrounding area)	HOM	8,408	224 miles/4.5 hours	5 daily

The anticipated economic growth in Seward improves the probability of an air carrier resuming service to Seward. Improved approach procedures with lower minimums could also increase the likelihood of scheduled air service; however FAA flight standards indicates an improved approach is very unlikely because of the terrain. Initially, carriers would most likely serve Seward with small aircraft, but if reliable air transportation is available, demand may increase over the next 20 years to make service with the larger commuter aircraft currently flying into Kenai and Homer a feasible option, at least seasonally. Kenai is presently served on a regular basis by the Beech 1900 (B-II) and Dash 8 (C-III) aircraft, and Homer is served by the Beech 1900.

Emergency Preparedness

A larger runway supports emergency preparedness. Although Seward is connected to other communities by rail, road and the marine highway, the airport provides essential access during emergency or disaster situations in when other access (single rail line and single highway) may be vulnerable. Reportedly, during the 1964 earthquake, the airport was minimally damaged but remained the only connection with the rest of Alaska for an extended period of time because the railroad, the Seward Highway, and the port facilities were completely destroyed (Seward Airport Master Plan, Phase II, Hydrology Report, by Skip Barber, July 25, 2006).

The U.S. Coast Guard (USCG) has landed C-130s at Seward in the past and would continue to use this aircraft at Seward if the pavement strength allowed it to land. The C-130 is an ADG IV aircraft used for support of search and rescue and for medical evacuation of mass casualties. The C-130 is not forecast to meet the threshold of regular use (500 annual operations), but it is extremely useful during emergencies such as avalanches, earthquakes, or flooding that disrupt road access to Seward. The USCG indicated that with a runway length of 4,500 feet they can normally operate at about 120,000 lbs., allowing enough fuel and gear to respond to most situations. The H-60 helicopters could also be used for mass casualty response, but the C-130 can respond more quickly; additionally, if the H-60 needed fuel, the C-130 could provide it. (e-mail, 8/14/2014, LT Robert Hornick, C-130 Assistant Operations Officer)

Forecast Method

Because DOT&PF is evaluating runway length and pavement strength, the most critical element to forecast at Seward Airport is the number of operations for each aircraft type. This will dictate the length of runway needed and how strong the pavement needs to be.

The most demanding aircraft (largest wingspan and longest required runway length) currently using the airport regularly is the **King Air B200**, which is used for medical evacuations. While the annual operations do not meet the FAA threshold of 500, they provide a critical service to the community.

Medevac operations can be expected to increase as the population increases. The population of Seward has historically grown at 1.23%. The population of the entire Kenai Peninsula Borough is forecast to grow at 0.5% annually. Seward has the potential to grow faster than the rest of the KPB if the economic factors discussed above begin to materialize (Vigor Industrial, CDQ fleet). Therefore, an annual growth rate in aircraft operations of 1.0% is selected for this forecast.

Step 5 – Apply Forecast Methods and Evaluate Results

With a 1% annual growth rate, SWD will see modest growth in aircraft operations (Table 10), with general aviation continuing to be the dominant type of operation.

Table 10 - Forecast Operations at SWD

Operations	Base Year 2013	+5 Years	+10 Years	+15 Years
Local GA	2,000	2,102	2,209	2,322
Itinerant GA	4,000	4,204	4,418	4,644
Medevac	200	210	220	230
Air Taxi	4,500	4,729	4,970	5,224

Step 6 – Compare Forecast with TAF

The base year data used in this forecast are consistent with the TAF. The TAF shows no change in aircraft operations at SWD throughout the planning period. Table 11 summarizes the differences between this forecast and the TAF.

Table 11 - Forecast - TAF Comparison

	2018			2023			2028		
	Forecast	**TAF**	***Difference***	**Forecast**	**TAF**	***Difference***	**Forecast**	**TAF**	***Difference***
Local GA	2102	2000	***102***	2209	2000	***209***	2322	2000	***322***
Itinerant GA	4204	4000	***204***	4418	4000	***418***	4644	4000	***644***
Air Taxi	4729	4500	***229***	4970	4500	***470***	5224	4500	***724***

Facility Requirements

The facility requirements depend on the critical design aircraft or group of aircraft. Federally funded projects require that critical design aircraft have at least 500 or more annual at the airport during the established planning period of at least five years. Under unusual circumstances, adjustments may be made to the 500 total annual operations threshold after considering the circumstances of a particular airport. Two examples cited in AC 150/5325-4B are airports with demonstrated seasonal traffic variations, or airports situated in isolated or remote areas that have special needs.

Wind Coverage

Wind conditions affect aircraft in varying degrees. Generally, the smaller the aircraft, the more it is affected by wind, particularly crosswinds, which are often a contributing factor in small aircraft accidents. The FAA provides the following guidance on maximum crosswind components for small to medium-sized aircraft.

Table 12 – Allowable Crosswind Components by Aircraft Design Group

Aircraft Design Group	Allowable Crosswind Component
ADG I Cessna 170, 185, 206	10.5 knots
ADG II Beech 200, 1900; Cessna 208, Grand Caravan	13 knots
ADG-III DC-6, Dash 8, 737	16 knots

Wind coverage is the percent of time crosswind components are below an acceptable velocity. A runway oriented to provide the greatest wind coverage with the minimum crosswind components is preferred. The desirable wind coverage for an airport is 95%. A second (crosswind) runway is recommended when the primary runway orientation provides less than 95% wind coverage.

Based on the current wind data available for Seward, a single runway oriented between 156 and 204 degrees north azimuth provides 95% or greater wind coverage (for ADG I aircraft).

- Runway 16/34 is oriented at 183 degrees, providing 98.6% wind coverage for ADG I aircraft.
- Runway 13/31 is oriented at 146 degrees, providing 91.1% coverage for ADG I aircraft and 96.0% coverage for ADG II aircraft.

Aircraft Use at Seward

The based aircraft at Seward are similar in design characteristics and could be served by an airport designed to the standards for ADG I, Approach Category A, with a runway length of 3,300 feet or less for small (under 12,500 lb.) aircraft. Although the A-I small aircraft design standards could have been used for the existing fleet, the A-I design standards were selected to allow for occasional operations of large aircraft. In addition, the Alaska Aviation Preconstruction Manual identifies a minimum runway length of 3,300’ for community class airports such as SWD. This is the minimum runway under consideration.

Seward has a demonstrated special need for the medevac aircraft (Beech B-200) used by three of the air ambulance companies serving Seward. If the Beech 200 is used as the critical design aircraft, the airport design standards increase to ADG II. US DOT T-100 statistics indicated other ADG II aircraft using Seward Airport in the past 5 years include the Beech 1900, Cessna 208 Caravan, and Pilatus PC-12.

Pilots and local officials expressed the desire for a runway that can accommodate small charter jets for tourism, emergency preparedness and search and rescue aircraft such as the Coast Guard C-130, and potential scheduled air service.

The C-130 and small charter jets are not forecast to meet the threshold of regular use, but have used Seward in the past and continue to desire the ability to land. Anecdotal information indicates that up to 20 small charter jets per year have landed at Seward in the past.

Airfield Requirements

Runways

Given the modest number of operations and slight growth anticipated in Seward, a greater growth factor in the forecast of operations would not show an increase great enough to warrant substantial changes in the facility requirements (such as a second runway or parallel taxiway). A single runway can handle between 62,000 and 131,000 operations annually based on VFR conditions and calculations with taxiway at midpoint and airport open for operation 8 to 12 hours per day, 5 to 7 days per week. This is significantly more operations than projected. Parallel taxiway systems to help improve runway capacity and minimize user delays are typically not warranted until annual operations approach 20,000.

Facility requirements are listed in the table below for three potential groups and compared with the larger of the two existing runways.

Table 13 – Runway Dimensional Standards for Various Scenarios

Feature	Current Based Aircraft Group	Current Demand & Medevac (Beech 200)	Growth Scenario & Emergency Preparedness (Beech 1900)	Existing R/W 13/31
Approach Category	A	B	B	B
ADG	I	II	II	II
Runway Length	3,300' (Note 1)	3,300' (Note 1)	4,000'/4,700' (Note 2)	4,533'
Runway Width	60'	75'	75' (Note 3)	100'
Visibility Minimums	1 mile	1 mile	1 mile	1 mile
Crosswind Component	10.5 knots	13 knots	16 knots	13 knots
Runway Safety Area	120' x 3,780'	150' x 3,900'	150' x 5,300'	150' x 4,749'
Object Free Area	400' x 3,780'	500' x 3,900'	500' x 5,300'	500' x 4,749'
RPZ	1,000' x 500' x 700'	1,000' x 500' x 700'	1,700' x 500' x 1,010'	1,000' x 500' x 700'
Part 77 Primary Surface	500' x 3,700'	500' x 3,700'	500' x 5,100'	500' x 4,649'
Part 77 Approach Slope	20:1 (Visual)	20:1 (Visual) (Note 4)	20:1 (Visual) (Note 4)	20:1 (Visual)

1. Minimum runway length for community airports per Alaska Aviation Preconstruction Manual exceeds FAA AC 150/5325-4B (2,750 feet for 95% of fleet or 3,250 feet for 100% of fleet) and Beech 200 published takeoff and landing distances.

2. The 4,700-foot runway length is based on FAA AC 150/5325-4B for aircraft over 12,500 lbs. but less than 60,000 lbs. (75% of fleet at 60% useful load). The FAA is circulating a Draft AC 150/5325-4C, which recommends using manufacturer's airport planning manuals for all large airplanes (over 12,500 lbs.). The Beech 1900D specification and performance sheet lists a takeoff length of 3,737 feet. Discussions with the primary air carrier in Alaska using this aircraft indicated a need for a 4,000-foot runway to accommodate it. A 4,000-foot runway option is being considered, which would accommodate the Beech 1900 and other large aircraft such as the Dash 8 and Sherpa.

3. Runway width may be increased to 100' to provide for larger emergency response aircraft such as the C-130.

4. By definition, a non-precision instrument (NPI) approach runway means a straight-in approach is planned or has been approved (Part 77.2). SWD's approach is currently a circling approach (RNAV [GPS]-A). Review of the FAA flight standards and local topography indicates a straight-in approach is not viable at Seward due to the mountainous terrain on all sides.

Taxiways / Taxilanes

Taxiways should be upgraded to meet the current standards. Major changes to taxiway standards have been made in the revisions to AC 150/5300-13 and AC 150/5300-13A since the design of the current airport. It will be critical to establish the design aircraft to be used for taxiway geometry, as taxiway design requirements are no longer established solely by the airplane design group, but also depend on the wheelbase and distance between the cockpit and main gear of the design aircraft. Current guidance indicates the taxiway intersections with runways should avoid the middle one third of the runway length. ¶401.b(5)(d) defines as a "high energy" intersection that should be avoided. "By limiting runway crossings to the outer thirds of the runway, the portion of the runway where a pilot can least maneuver to avoid a collision is kept clear." Taxiways A and D currently conflict with this guidance.

Further, taxiways providing direct access from the aircraft parking areas to a runway should be avoided (¶401.b(5)(g) and ¶503.). Taxiways C, D, E, and F currently conflict with this guidance. Future layouts should consider correcting this deficiency.

The key dimensional standards that need to be considered in developing the layout of Group II facility improvements are listed in the table below.

Table 14 – Taxiway and Taxilane Design Dimensions Based on Aircraft Design Group II (per AC 150/5300-13A; Table 4-1)

Feature	Near Term & Ultimate – B-II (Beech 200 & Beech 1900)	Existing
Runway to Taxilane Separation	240'	184' (Note 1)
Taxiway Safety Area	79'	79'
Taxiway OFA	131'	131'
Taxilane OFA	115'	131'
Taxilane Centerline to Fixed or Movable Object	57.5'	
Taxilane Wing Tip Clearance	18'	

1. Separation distance shown on 2008 ALP between Runway 16/34 CL and GA apron taxilane (A-I small requires 150 feet, A-I large requires 225’).

To meet the dimensional standards above and preserve the existing BRL and GA apron size, a runway parallel to the apron (Runway 16/35) would need to have a runway-to-BRL separation of 394.5 feet; the existing Runway 16/35 is separated from the BRL by only 300 feet. Additional separation may be needed to correct the layout deficiency of taxiways that provide direct access from the runway to aircraft parking areas.

Navigational Aids and Airfield Lighting

One set of VASI lights is installed on RUNWAY 31. The previous master plan indicated the VASI should be replaced with PAPIs on both ends of all runways. This is not feasible at Seward, because of the terrain on the north end of the airport. Only the south end can achieve the PAPI Obstacle Clearance Surface which extends 4 miles out from the end of the runway.

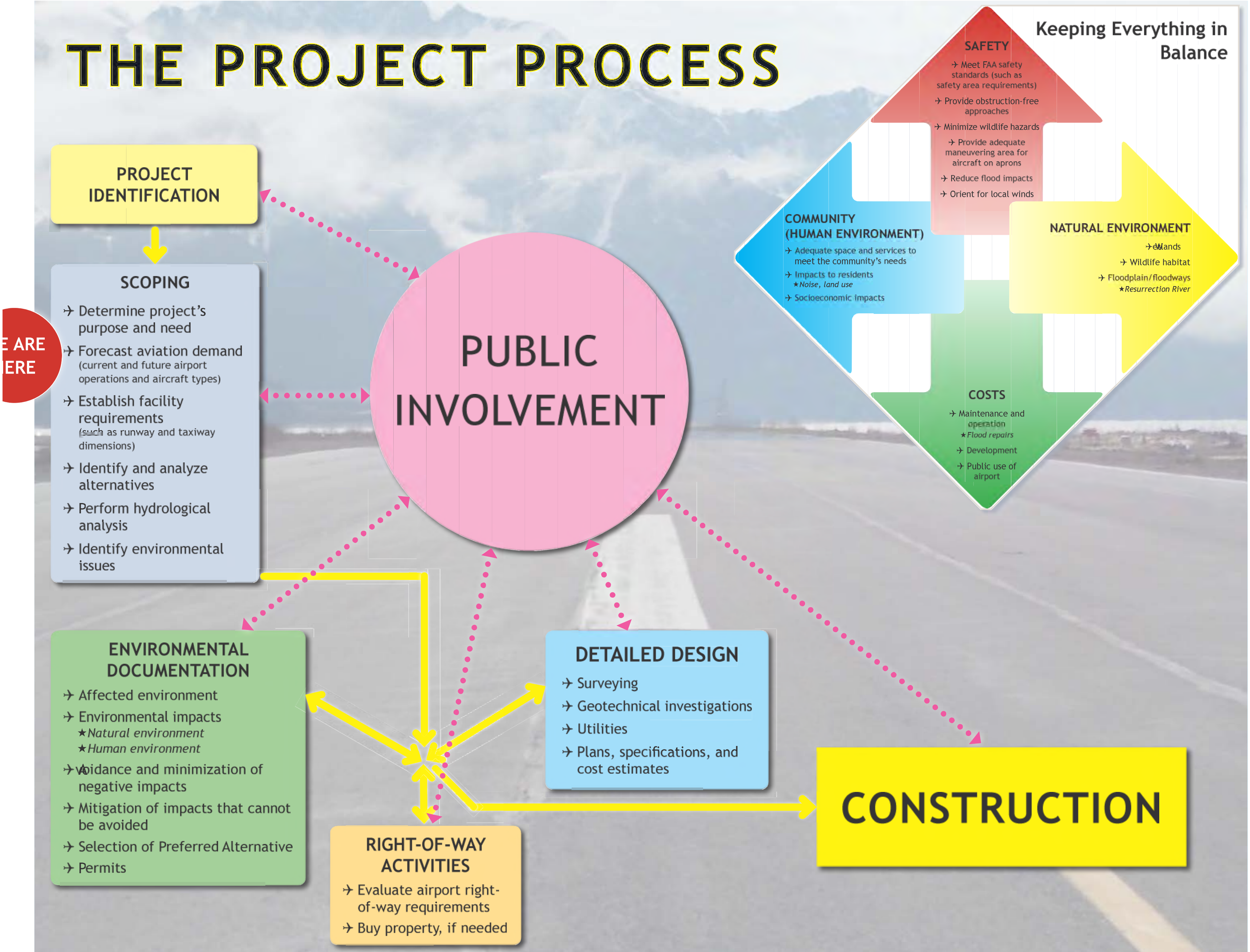
The airfield lighting system is old and should be upgraded and expanded to include taxiways and all runways.

During any paving project, the runway and taxiway markings should be replaced with markings that meet current guidance. Seward Airport runways will continue to be marked as visual runways. SWD currently has a published GPS approach for Category A and B aircraft, but it is rarely used because of the high minimum descent altitude (2,660 feet). This published approach is not a straight-in approach, so the runway is not considered an NPI runway. There are no instrument approaches for Category C and D aircraft.

Other Facility Requirements

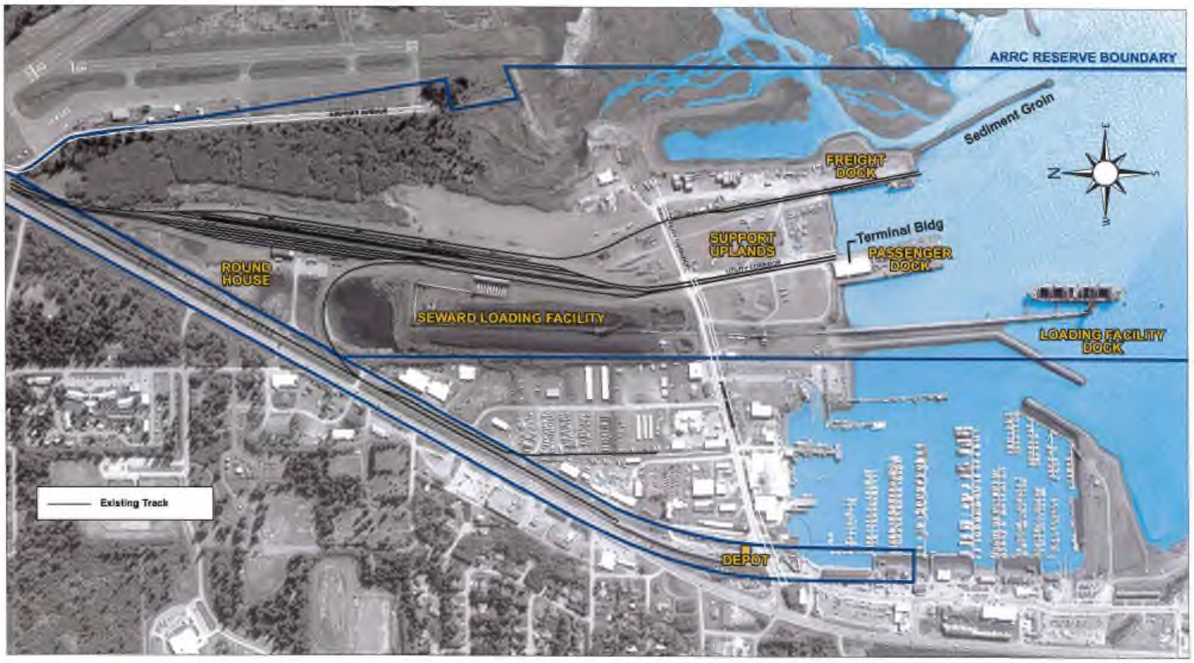
A new sand storage building is needed. The existing building is in poor condition.

The airport access road, Seward Highway, and the Alaska Railroad are all within the RPZ of Runway 13/31, and a small portion of the RPZ of Runway 16/34 overlaps the access road. Although prior to FAA’s *Interim Guidance on Land Uses within a Runway Protection Zone* (9/27/2012) these transportation uses were acceptable, they are not encouraged. Additionally, due to their proximity to the end of Runway 13/31, these transportation features create an obstruction to that approach. Correction of these non-standard conditions should be considered to the extent practicable.

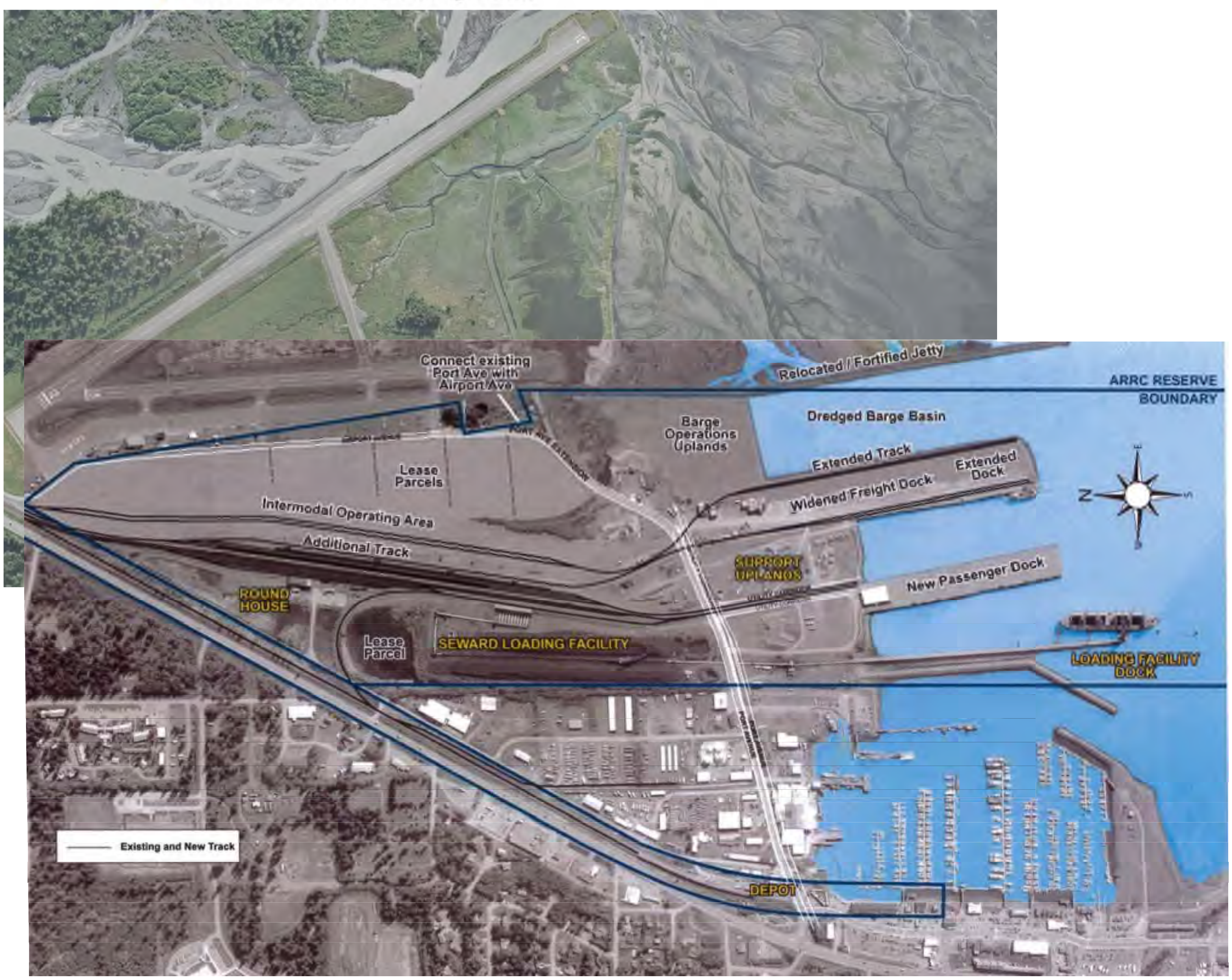


THE PROJECT PROCESS
PROJECT IDENTIFICATION
SCOPING
✈ Determine project's purpose and need
✈ Forecast aviation demand (current and future airport operations and aircraft types)
✈ Establish facility requirements (such as runway and taxiway dimensions)
✈ Identify and analyze alternatives
✈ Perform hydrological analysis
✈ Identify environmental issues
E ARE
ERE
PUBLIC INVOLVEMENT
ENVIRONMENTAL DOCUMENTATION
✈ Affected environment
✈ Environmental impacts
★Natural environment
★Human environment
✈ Avoidance and minimization of negative impacts
✈ Mitigation of impacts that cannot be avoided
✈ Selection of Preferred Alternative
✈ Permits
RIGHT-OF-WAY ACTIVITIES
✈ Evaluate airport right-of-way requirements
✈ Buy property, if needed
DETAILED DESIGN
✈ Surveying
✈ Geotechnical investigations
✈ Utilities
✈ Plans, specifications, and cost estimates
CONSTRUCTION
Keeping Everything in Balance
SAFETY
✈ Meet FAA safety standards (such as safety area requirements)
✈ Provide obstruction-free approaches
✈ Minimize wildlife hazards
✈ Provide adequate maneuvering area for aircraft on aprons
✈ Reduce flood impacts
✈ Orient for local winds
COMMUNITY (HUMAN ENVIRONMENT)
✈ Adequate space and services to meet the community's needs
✈ Impacts to residents
★Noise, land use
✈ Socioeconomic impacts
NATURAL ENVIRONMENT
✈ Wetlands
✈ Wildlife habitat
✈ Floodplain/floodways
★Resurrection River
COSTS
✈ Maintenance and operation
★Flood repairs
✈ Development
✈ Public use of airport

ARRC Seward Terminal Reserve: Existing Facilities

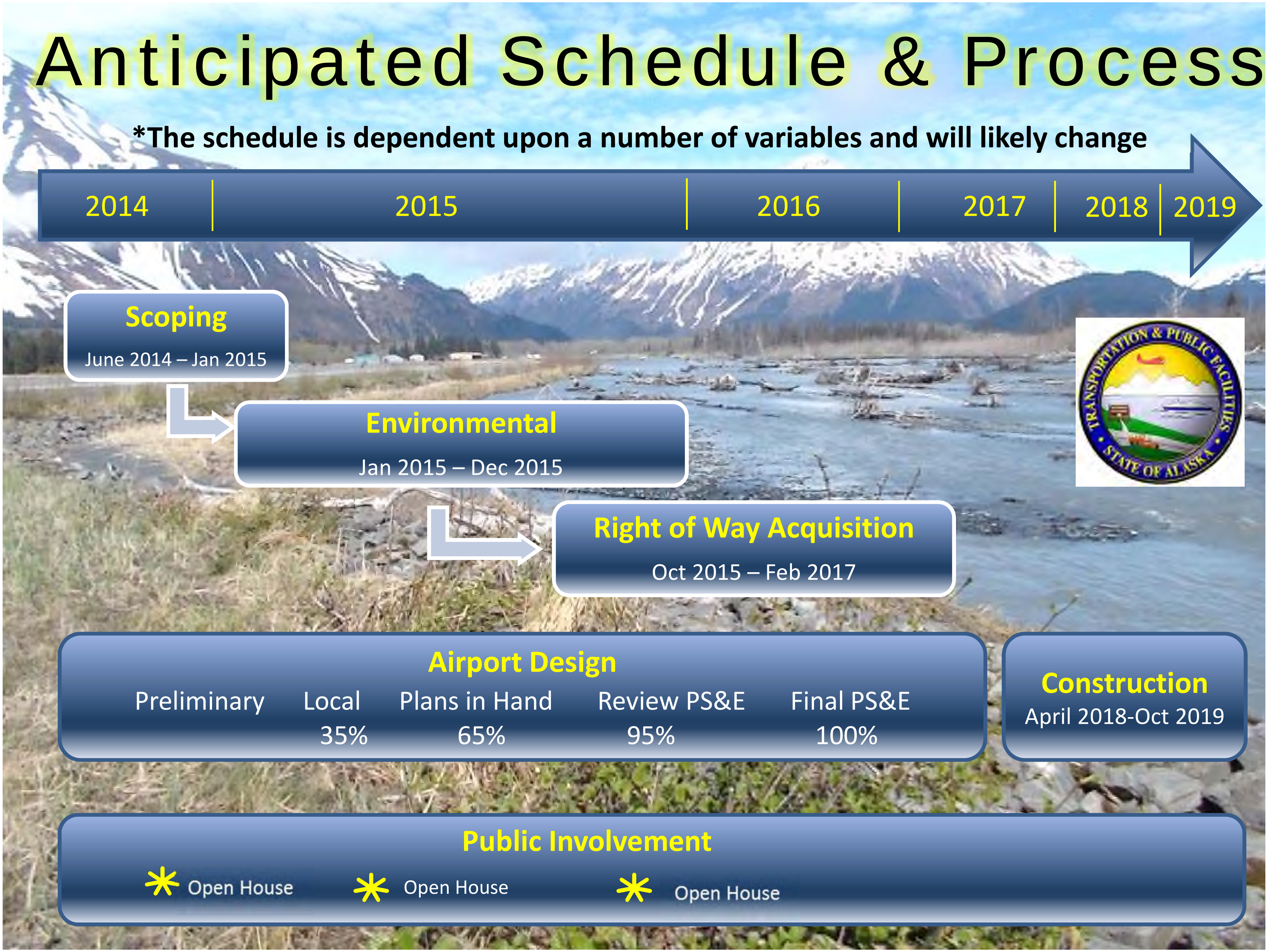


- Seward Reserve 328 acres
- Seward Loading Facility (coal and gravel)
- Passenger Dock, Terminal and Supporting Uplands
- Freight Dock and Supporting Uplands
- Seward Yard and Operating Tracks



ARRC Seward Master Plan: Future Development


RUNWAY 13/31
RUNWAY 16/34


Anticipated Schedule & Process
*The schedule is dependent upon a number of variables and will likely change
2014
2015
2016
2017
2018
2019
Scoping
June 2014 – Jan 2015
Environmental
Jan 2015 – Dec 2015
Right of Way Acquisition
Oct 2015 – Feb 2017
Airport Design
Preliminary
Local 35%
Plans in Hand 65%
Review PS&E 95%
Final PS&E 100%
Construction
April 2018-Oct 2019
Public Involvement
Open House
Open House
Open House
TRANSPORTATION & PUBLIC FACILITIES
STATE OF ALASKA

MEMORANDUM

Date: November 24, 2014

To: Barbara Beaton, DOT&PF Project Manager

From: Carla SlatonBarker (Solstice Alaska Consulting) with input and review from Royce Conlon, PDC Project Manager

Subject: Summary of 11/19/2014 Stakeholder Working Group Meeting #1-- Seward Airport Improvements Project (#54857)

Introduction: Meeting Overview

This document provides a summary of the first Stakeholder Working Group (SWG) meeting held on November 19, 2014, for the Seward Airport Improvements Project. The meeting was held in Seward at the Community Library Small Conference Room. The meeting began at 11:30 and ended at 2:00. Table 1 lists the meeting attendees.

Table 1. Meeting Attendees

SWG Membership	Name
Alaska Railroad Corporation	Jim Kubitz with Paul Farnsworth and Louis Bencardino
City of Seward: Seward City Council	Christy Terry
City of Seward: City Manager/Community Development	Ron Long
Civil Air Patrol	Brandon Anderson (teleconference participation)
Federal Aviation Administration (FAA)	Mike Edelmann (teleconference participation)
KPB Seward/Bear Creek Flood Service Area, Water Resource Manager	Dan Mahalak
Lease Holder, GA Pilot, Community Member	Dennis Perry
DOT&PF Maintenance	Sean Montgomery
DOT&PF Project management, Central Region Design and Engineering	Barbara Beaton, P.E., Project Manager
DOT&PF Central Region Design and Engineering	Joy Vaughn, P.E., Consultant Coordination
Consultant	Royce Conlon, P.E., PDC Inc. Engineers, Consultant Team Project Manager
Consultant	Ken Risse, PDC Inc. Engineers, Civil Engineer (teleconference participation)
Consultant	Carla SlatonBarker, Solstice Alaska Consulting, Public Involvement

Meeting materials including the agenda, a draft technical memorandum titled “Aviation Activity & Facility Requirements,” an executive summary of the draft technical memorandum, and handout packet (containing schedule, process, floodplain mapping, and land use and development information used as displays at the September 2014 public meeting) were distributed via email the afternoon prior to the meeting. Table 2 presents the meeting agenda to document the meeting objectives, goals, and format.

Table 2: Agenda

Meeting Agenda and Overview

<u>Meeting #1 Objectives (Our Work Today)</u>

- Form and clarify the work of Stakeholder Working Group (SWG).
- Establish consensus on problem and project needs.
- Present the draft "Aviation Activity & Facility Requirements" technical memorandum (provided in advance) and ensure that SWG members understand findings and have an opportunity to provide input.
- Learn from and incorporate SWG information and perspectives into project documents.

<u>Meeting #1 Goals (Meeting's End Result)</u>

- SWG understanding of the project, the process, and SWG role.
- SWG agreement with the draft "Aviation Activity & Facility Requirements" report (support for the methodology and findings) OR with specific action items to resolve document deficiencies.
- SWG introduction to project options and constraints.

<u>Meeting Agenda (Topic and Timeline)</u>

Part 1: Getting Started (11:30 am to 12:00 pm)

- Welcome, Introductions, Role of the SWG, Meeting Overview (Carla SlatonBarker, Solstice Alaska Consulting)
- Problem & Needs, Project Process, and SWG Input (Royce Conlon, P.E., PDC Inc. Engineers)

Part 2: Understanding the Draft "Aviation Activity & Facility Requirements" Report (12:00 to 12:30 pm)

- Draft Report Overview (Royce Conlon)
  - Why understanding the aviation activity is important
  - Steps, research, contacts, current forecasts, findings—do we have any gaps?
  - Facility requirements
- Constraints Discussed (Royce Conlon)
  - Funding constraints: What does FAA need to consider the different facility requirements scenarios?

SHORT BREAK

Part 3: Visualizing Options and Constraints (12:35 to 1:15 pm)

- Actions and Options -- Discussion of What This All Means (Royce Conlon)
  - Floodplain constraints
  - Alaska Railroad plans
  - Design Options

Part 4: Next Steps and Needed Actions (1:15-1:30)

- Project Schedule and Milestones (Royce Conlon)

Adjourn (1:30) *Thank you for your time and participation!*

Visit the project on the web at: www.dot.state.ak.us/creg/sewardairport/

Part 1: Getting Started

The meeting began with introductions, and then Carla SlatonBarker, Solstice Alaska Consulting, provided an overview of the meeting's objectives, goals, and agenda, as well as the role of the SWG. Next, Royce Conlon, PDC, provided an overview of the project. Before beginning the technical work of the day, Carla, asked if all had reviewed the meeting materials, which were emailed mid-afternoon the day prior. Many attendees did not have the time needed to review the materials in advance of the SWG meeting, and other members noted there was a problem with the email delivery. We discussed solutions: providing more lead time for review in advance of the next meeting; not emailing attachments and instead setting up an internet file storage area; for this meeting, reviewing the technical memorandum in more detail because many did not have a chance to review; and allowing the SWG to provide comment on the contents after the meeting.

Part 2: Understanding the Draft "Aviation Activity and Facility Requirements" Report

The objective of this part of the meeting was to present an overview of the draft "Aviation Activity & Facility Requirement" technical memorandum, answer questions, and record comments. The goal was to obtain SWG agreement of the draft document or determine ways to resolve identified document deficiencies. The following is a summary of SWG input. This input will be used to revise the draft "Aviation Activity and Facility Requirements" technical memorandum, where appropriate. The project team will explain how comments were or were not incorporated, and reasons why, during future SWG coordination.

SWG Comments Related to Methodology

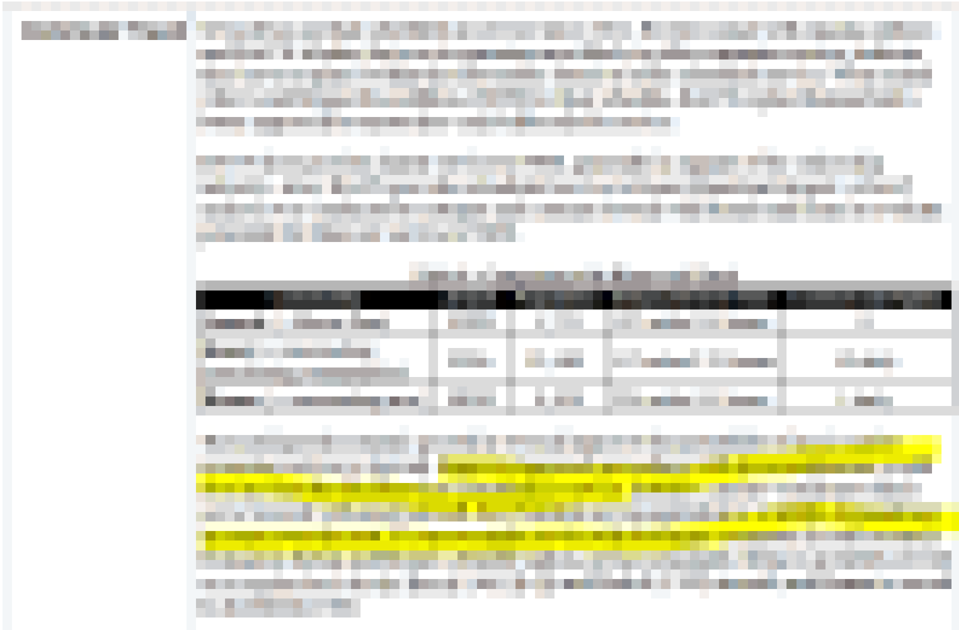
- Extend the planning period back in time to capture the previous commercial operations that will most likely occur again.
- Use a master plan approach for planning improvements: discuss improvements needed over time (20 years).

☐ ***ACTION ITEM--Project Team:*** *Review FAA guidance related to project's planning period and the reasonableness and efficacy of including data from the mid to late 1990s.*

SWG Comments Related to Existing and Future Aviation Activity

- Don't base historic aviation activity on recent data (2008+ data); instead, report activity during the mid to late 1990s when Seward was part of the Essential Air Service (EAS) program.
- Discuss the EAS program in the tech memo in terms of how an EAS status for the Seward airport (SWD) would likely change (increase) future aviation activity (fleet mix and number of operations). The EAS program is a mechanism for encouraging more commercial operations. This point should be addressed in relation to historic and forecast aviation activity.
    - Encouraging commercial operations or developing EAS status for SWD is outside DOT&PF's scope and the scope of this project. This could be the City's role, and any documentation of industry intention could be used as data on this project.
- Include discussion of how current aviation activity may be affected by *the perception* that SWD has an ongoing flooding problem.
- Make sure there is a discussion in the tech memo on SWD approaches. Future aviation activity would be greater if an improved approach with lower minimums can be established.

- **Team response:** This information on improved SWD approaches and potential increase to aviation activity is reflected in the technical memorandum (p. 9) and reported below:



- Include reference to the changeable weather at SWD. .
- The tech memo under reports flight activity from Bear Lake.
  - **Team response at the meeting:** It is difficult to get exact numbers for general aviation (GA) operations at facilities without towers and GA operations may be underreported for various reasons; however, the number of GA operations does not affect the facility requirements because at a minimum DOT&PF will provide for GA operations.

☐ ***ACTION ITEM--Project Team:*** *Set up a conversation between Dennis Perry, SWG member and GA pilot, and FAA approach personnel to discuss SWD approaches.*

SWG Comments Related to Discussion of Tech Memo's Socioeconomic Analysis

- Seward's economy is "trending upwards" in a way that the draft report does not fully reflect. Examples of this provided by ARRC and the City of Seward are:
  - Current and predicted industry would rather fly than bus workers to Seward, as noted by Jim Kubitz, ARRC SWG member. The City (Christy Terry and Ron Long) and ARRC members noted that when Shell was in Seward, the company couldn't believe there was not scheduled air service. Crews were bussed and traffic accidents occurred.

- **Team response:** The tech memo references this point on page 7 (see excerpt below):

  > **Alaska Railroad (ARRC) Facility Improvements**
  >
  > The ARRC is planning a substantial investment and improvements in the port and rail facilities adjacent to the airport. During a coordination meeting, ARRC staff indicated that if the airport had regularly scheduled flights, ARRC would prefer to have its crews and management teams who occasionally commute to/from SWD fly versus traveling by rail or highway. Travel time and safety were the primary reasons cited. The specific number of enplanements this would equate to is undetermined.

- The City of Seward reported that a cruise ship is relocating from Whittier to Seward, which will potentially increase aviation activity. This information is not reflected in the current draft memorandum.
  - **Team response:** The tech memo will be revised to note that charters could increase.

- The City of Seward reported that the Seward Marine Center is the homeport for the 260-foot *R/V Sikuliaq*. This Alaska Region Research Vessel will be ready for science operations in 2014 and will likely cause an increase aircraft operations between Anchorage and Seward. This information is not reflected in the current tech memo.
  - **Team response:** The tech memo will be revised to include this information.

- If oil is discovered in the Beaufort and Chukchi Seas,it is possible that demand at the Seward Airport may increase.
- Any increase in activity in the Arctic maycontribute to Seward's upward economic and population trend. The City of Seward believes that their port is a better (more protected) overwintering port than Nome or Dutch Harbor.
  - **Team response:** More research regarding the two bullet points above is needed to become data for the tech memo.

- The City is planning for this "upward trend" now, including a $270 million breakwater that is in long-term development. This breakwater will allow for 100-210 shallow-draft vessels.
- ARRC is planning major improvements in three areas as articulated in the Alaska Railroad Seward Reserve Master Plan: Waterfront Development, Commercial Development, and Intermodal Expansion. These improvements are detailed in a planning document that Jim Kubitz provided to the team. Particularly these improvements involve:
  - Waterfront Development: Widening the freight dock, improving the dock's ability to accommodate barges, and expanding the dock's capacity (more vessels, more operations) to handle freight.
  - Commercial Development: Developing and preparing real estate parcels to accommodate freight customers and upland operations; extending Port Avenue to connect with Airport Avenue; opening an industrial area to accommodate

heavy industrial activity; facilitating commercial and light industrial development on the Passenger Dock uplands area; developing commercial real estate along the small harbor's boardwalk.
    - Intermodal Expansion: Developing an intermodal operating area (ship-to-train, ship-to-truck or ship-to-barge) to accommodate freight customer growth and intermodal/barge freight activity, installing more track and new access point gates.
- ARRC is actively and successfully working this plan; for instance, the ARRC applied for and won a U.S. Department of Transportation TIGER (Transportation Investment Generating Economic Recovery) grant to plan these improvements. TIGER funding will help ARRC consider vessel berthing and freight handling needs within the ARRC Terminal to ensure the dock is designed to meet future requirements. ARRC is using this funding to move the Waterfront Development plans to the next step: final design and costs. Earlier work has the expanded freight dock almost fully permitted. Then the next step under Waterfront Development will be construction of a new breakwater and dredging the barge basin. Full funding is eminent for planned freight improvements.
    - ARRC's view is that these expansion projects will improve service to marine customers, enhancing local economic development efforts to grow freight business activity.
    - *Note: Jim Kubitz expressed ARRC's desire to "clean up" property boundaries through a land exchange.*
- **Team response during the meeting:** The project team asked for documentation to support the view that Seward will experience an upward economic trend. Documentation of this future intent is needed because the project cannot be developed under a "improve the airport and then they will come" approach.
- The group discussed the use of a 1.23% growth rate in the draft technical memo and the use of, perhaps, a 2% growth rate, instead of the 1% currently being used.

☐ ***ACTION ITEM: City of Seward (Christy Terry or Ron Long).*** *Provide the project team with documentation from any industries wanting to locate/develop industry in Seward to document an upward economic or population trend. Documentation of this future intent should indicate increases in population and/or air transportation needs expected from the action.*

☐ ***ACTION ITEM: City of Seward (Christy Terry).*** *Provide contact information or relationship to future aviation activity needs for the Seward Marine Center and R/V Sikuliaq.*

☐ ***ACTION ITEM--Project Team:*** *Revise forecast aviation activity section of tech memo, as noted above, to reflect new information on future industry activity.*

SWG Comments Related to Funding

In this part of the meeting, Mike Edelmann, FAA, supported the conversation. He explained that there are categories of FAA funding, and to be eligible for FAA funding, there are legislative and legal requirements. The FAA funding that this project would be using is from the Airport Improvement Program (AIP). AIP funding can only be used for reasonable and justified improvements to support current and forecast airport needs. He explained that FAA can't spend money on a "if we build it, they will come" approach. FAA is required to evaluate if a proposed project involves a longer or wider runway than needed or than data support.

- **Question from the City of Seward:** Will FAA allow a community to "build more airport" if the community feels that it is part of its future economic development plan?
- **Answer from FAA:** If city funding, state funding, or other funding is available, a community can build more airport. For instance, the FAA encourages partnering with other federal funding agencies such as FEMA or Homeland Security related to emergency preparedness. There might be other opportunities related to economic development funding and industry. FAA could participate with another entity. Research would be needed related to ensure that FAA guidelines (safety, etc.) would be met.
- A comment was made that "everything is on the table" for study and that creative partnerships are possible; but in the end, it is likely that the deciding factor in making decisions will be based on use of FAA funding, as it is presently the only identified viable funding source.

SWG Comments Related to Tech Memo's "Most Demanding Aircraft"
Another focal point to the presentation and conversation during this part of the meeting was an overview of current and forecast aircraft. The following funding constraint was also explained verbally and in the material: Federally funded projects require that the critical design aircraft (the most demanding aircraft) have at least 500 or more annual operations at the airport during the established planning period.

- The C-130 and small charter jets that currently use SWD are not anticipated to meet the federal threshold of regular use. Anecdotal information indicates that up to 20 small charter jets per year have landed at Seward in the past.
- Although medevac aircraft provide a critical service to the community, they do not meet the FAA threshold of 500. Medevac aircraft can and do operate on runways throughout Alaska with the same length as our shortest alternative.

SWG Comments on Aircraft:

- SWG members shared the view that the population and industry in SWD could support commuter service in the future.
- SWG members shared view that SWD airport is an important training ground for Coast Guard touch-n-go operations. Cold Bay is the next closest airport for these operations. The Coast Guard could be called upon in a case of mass causality to do medevac with the C-130.
    - **Question:** With this important activity, couldn't the medevac be the critical design aircraft? **Answer from FAA:** FAA funds can't be used to fund another agency's needs. The Coast Guard needs to provide funding if this activity drives airport improvements. Also, the number of operations is under 500 threshold needed to be considered a design aircraft.

The project team reiterated the need for additional data or information (beyond what is reported in this tech memo) to consider use of federal funds for any scenario involving a runway length greater than 3,300 feet.

Part 3: Visualizing Options and Constraints
During this part of the meeting, project options were presented to help SWG members visualize airport options and constraints. SWG members were cautioned that these options were simply to aid thought and support conversation. No analysis has been completed—the drawings show FAA separation distances, runway length, and runway width. In consideration of location; the layouts are overlain on aerial photography to show placement as related to the road and railroad on the north end, the FEMA floodway, tidelands and ARRC proposed development plan. Four templates were presented to facilitate discussion and these are summarized below:

Option 1: This layout considers two options. Option 1.1 involves raising runway 13/31 above the 100 year flood elevation and providing for erosion protection. Option 1.2 would involve reconstructing the existing embankment to allow flood overtopping. This option explores design elements to enhance drainage (a rock structure that drains quickly) and to enhance runway strength (structure that is much less compromised by flooding). Under this option, however, there would still be periods when the runway would be closed due to flooding. Under both these options, runway 16/34 would continue to operate as the crosswind runway.

Options 2-4 (summary): The other options involve improvements to the crosswind runway if the main runway cannot be reasonably repaired due to cost or feasibility. Options 2, 3, 3.1, and 4 (below) all abandon runway 13/31. They all present variations in length, width, and orientation. The team cautioned, though, that these are just templates that present design dimensions to begin the conversation about constraints (namely the floodway, tidelands, and adjacent land use).

Option 2: Involves reconstructing runway 16/34 as a 3,300-by-60-foot runway, which corresponds to the facility requirements for a Design Group A-I facility. This size facility is designed for a small design aircraft, but can be used by larger aircraft on a less frequent basis. As required by federal guidelines, runway 16/34 would have a slightly new alignment, resulting from increasing the distance between the taxilane centerline and the runway centerline from the existing 184 feet to 225 feet, and from shifting the runway centerline itself 46 feet from its existing location.

Option 3: Involves reconstructing runway 16/34 as a 4,000-by-75-foot runway, which corresponding to the facility requirements for a Design Group B-II facility which can support larger aircraft. As required by federal guidelines, runway 16/34 would have a slightly new alignment, resulting from increasing the distance between the taxilane centerline and the runway centerline from the existing 184 feet to 240 feet, and from shifting the runway centerline itself 82 feet from its existing location. The runway extends approximately 1038' into the tidelands. The runway would accommodate commuter aircraft such as the Beech 1900. A shorter version (3,300 feet) would accommodate the Beech 200 Medevac aircraft.

Option 4. This option draws a 4,700-by-75-foot runway. It depicts the same distance between the runway centerline and the taxilane centerline as option 3 (240 feet) and it has the same runway centerline shift of 82 feet. This option extends approximately 1,617' into the tidelands and the RPZ has greater overlap with the ARRC proposed facilities.

SWG Comments from SWG Members on the Options

Dredging, City of Seward: What about an option that explores dredging? Isn't dredging an option on the table?

- Barbara Beaton from DOT&PF answered that this project won't be looking at dredging. She explained that there are legal issues that could result from dredging, so this will not be pursued. She also noted that there is no on-going maintenance funding to make dredging a long-term solution to the airport problems. She noted that this decision was made at a policy level, by supervisors above her.
- Ron Long expressed that he was disappointed to hear that not "everything is on the table", as was presented earlier. He noted strongly that for the City, dredging is an effective and desirable solution. He noted that the "lack of maintenance funds" is not an effective reason, because everything has an O&M cost. He also noted that not pursuing dredging for "legal reasons" is a very comfortable position for DOT&PF.
- Barbara Beaton informed the board members of a Task Force that was assembled during the 1990's. Task Force members were composed of representatives from several government agencies. According to the Task Force Report, two government agencies (not including DOT/PF) were responsible for annually dredging the river. The dredging was never done.

The conversation hit an impasse at this point. Without resolution, the meeting moved forward.

Floodplains, Dan Mahalak. Dan verified the project's team's data that FEMA prohibits enlarging or raising the elevation of structures withina floodway.

Wind Coverage: The wider the runway the better. The existing taxiway is a "white-knuckles" experience in some wind conditions.

Property details. Jim Kubitz, ARRC, noted that the red line (airport property boundary) on the drawings is not accurate. The small triangle of land on the existing apron is owned by the ARRC but presently leased long-term to the airport. Jim hopes between this project and the ARRC project this land can be transferred to the airport in a land swap. The ARRC is planning improvements that go into state tidelands to construct a jetty.

Duck hunting, project team. The public at the September meeting commented on the desire for access to the floodplain for hunting. It was also noted that hunting adjacent to the airport may not be a compatible land use. This land may be under control of Ducks Unlimited.

Materials, City of Seward. The City of Seward will have a lot of shot rock from the construction of the Marine Center that could be available for use at the airport. With City Council approval, the City may be able to provide DOT&PF with material for this project.

Impacts to Floatplanes, Dan Mahalak. The options to lengthen runway 16/34 cut off access to floatplanes that currently use the area to change out from floats to wheel & vice versa. Also, there is nothing about floatplane activity or a ski strip in the tech memo.

- **Team response**: The team will consider options of addressing the se situations and whether they can be inc within the scope of this project.

(Note from the facilitator: At this point in the meeting, the group hit the information saturation point. We ended this part of the meeting after Royce Conlon finished presenting each option.)

Part 4: Next Steps and Needed Actions

Summary of Action Items:
The following lists definitive action items that resulted from the meeting and listed earlier in this meeting summary.

- ☐ ***ACTION ITEM: City of Seward (Christy Terry or Ron Long).*** *Provide the project team with documentation from any industries wanting to locate/develop industry in Seward to document an upward economic or population trend. Documentation of this future intent should indicate increases in population and/or air transportation needs expected from the action.*
- ☐ ***ACTION ITEM: City of Seward (Christy Terry).*** *Provide contact information or relationship to future aviation activity needs for the Seward Marine Center and R/V Sikuliaq.*
- ☐ ***ACTION ITEM--Project Team:*** *Revise forecast aviation activity section of memo, as noted above, to reflect new information on future industry activity.*
- ☐ ***ACTION ITEM--Project Team:*** *Review FAA guidance related to project's planning period and the reasonableness and efficacy of including data from the mid to late 1990s.*
- ☐ ***ACTION ITEM--Project Team:*** *Set up a conversation between Dennis Perry, SWG member and GA pilot, and FAA approach personnel to discuss SWD approaches.*

Next Steps
To conclude the meeting, Barbara Beaton, DOT&PF, outlined the following next steps.

- **Techn Memo:** The team will update the draft technical memo presented today; send a revised draft to SWG members; take comment; and then finalize the tech memo.
    - Please provide comments to Carla SlatonBarker (Carla@solsticeak.com). Barbara noted that the team will prepare meeting notes, but that individually written comments are important to ensure that the team records SWG member comments correctly.
- **Access to materials:** The team will make available to SWG members the drawings and materials today and for future meetings via an Internet-based project library.
- **There will be regular meetings.** The team will contact you to plan for the next meeting, possibly in December, if schedules allow.

Adjourn

The meeting concluded at 2:00. Thank you for your participation!

Robin Reich

From: Robin Reich <robin@solsticeak.com>
Sent: Wednesday, July 15, 2015 3:57 PM
To: 'lindamoodb@akrr.com'; 'bca.alaska@gmail.com'; 'dmahalak@kpb.us'; 'kubitzj@akrr.com'; 'mike.edelmann@faa.gov'; 'cterry@cityofseward.net'; 'terryc@akrr.com'; 'BearLakePilot@gmail.com'; 'dennis.perry@alaska.gov'; 'rlong@cityofseward.net'; 'sean.montgomery@alaska.gov'
Cc: 'Barbara J Beaton (DOT)'; 'Royce Conlon (RoyceConlon@pdceng.com)'; 'Joy A Vaughn (DOT)'; 'Olivia Cohn'; 'Carla SlatonBarker'
Subject: Seward Airport Stakeholder Working Group Meeting #2 Tues, July 21 11 am

Hello Seward Airport Stakeholder Working Group Members;

Based on everyone's availability, we have set the next working group meeting for TUESDAY, JULY 21 @ 11:00 am- 12:45 pm. The meeting will be by teleconference.

The call in number for the meeting will be: 1-800-315-6338 access code: #10285

The project team has prepared the following documents for the meeting:

- Stakeholder Working Group Meeting #2 Agenda
- Stakeholder Working Group Meeting #1 Notes
- Final "Forecast of Aviation Activity & Facility Requirements" Technical Memorandum

By tomorrow, you will be receiving an email from Basecamp. Just click on the Basecamp link, enter a username and password, and you should be able to access these documents.

To help our meeting run smoothly, it would be great if everyone could review the materials and come with questions and input.

If you have any trouble accessing Basecamp or downloading materials, please let me know.

Thanks.

Robin Reich
Solstice Alaska Consulting, Inc.
2607 Fairbank Street, Suite B
Anchorage, AK 99503
907.929.5960
Cell: 907.903.0597

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Meeting #2 Agenda and Overview

Meeting Objectives (Our Work Today)

- Discuss the November 24, 2014 SWG Meeting #1 summary and action taken (provided in advance).
- Answer questions regarding Final "Aviation Activity & Facility Requirements" technical memorandum (provided in advance).
- Discuss the project's status and next steps.

Meeting Goals (Meeting's End Result)

- SWG understanding of the Final "Aviation Activity & Facility Requirements" technical memorandum.

Meeting Agenda (Topic and Timeline)

- **Introductions and purpose of the meeting**
  (Robin Reich, Solstice Alaska Consulting) (11:00-11:15 am)

- **Welcome**
  (Barb Beaton, P.E., DOT&PF) (11:15-11:20 am)

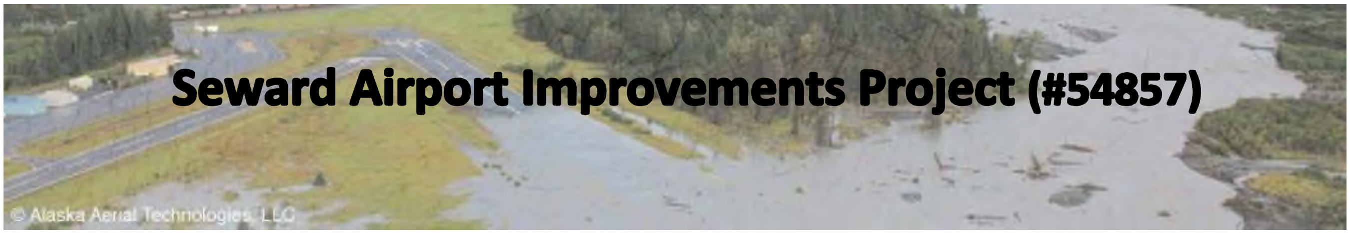
- **Questions regarding SWG Meeting #1 minutes**
  (Robin Reich) (11:20-11:35 am)

- **Final "Aviation Activity & Facility Requirements" tech memo discussion**
  (Royce Conlon P.E., PDC Inc. Engineers) (11:35 am-12:30 pm)

- **Status on other project activities and next steps**
  (Royce Conlon) (12:30-12:45 pm)

Adjourn (12:45 pm) *Thank you for your time and participation!*

Visit the project on the web at: www.dot.state.ak.us/creg/sewardairport/



EXECUTIVE SUMMARY
"Forecast of Aviation Activity & Facility Requirements" Technical Memorandum

The "Forecast of Aviation Activity & Facility Requirements" technical memorandum is a foundational planning document for the Seward Airport Improvements Project. It reports current and expected future aviation activity at the Seward Airport (SWD) in terms of type of aircraft and number of flights (operations). A design aircraft is selected by comparing this information with federal airport design guidance. The design aircraft corresponds to a runway design code, which determines the airport's dimensional requirements (runway width, length, offset from parked aircraft, etc.).

The technical memorandum reports that SWD air traffic activity includes single and twin-engine general aviation (GA) aircraft, medevac aircraft, military aircraft, and helicopters. The memorandum also reports anticipated future aircraft operations. In forecasting the number of operations for each aircraft type, the technical memorandum considers many factors influencing Seward's future.

Presently the most demanding aircraft in steady use (largest wingspan and longest required runway length) is the King Air B200, which is used for medical evacuations. Because project funding is being provided predominately (93.75%) by the federal government through the Federal Aviation Administration (FAA), the key to the viability of any of these scenarios is the adherence with federal guidance and the availability of federal funding. Federally funded projects require that the critical design aircraft (the most demanding aircraft) or family of aircraft have at least 500 or more annual operations at the airport. Also FAA does not fund public airports to support military or other federal agency operations. As such, if another federal agency activity drives the need for airport improvements, that agency would need to provide the funding.

The technical memorandum reports that there will be a modest increase to aviation activity at SWD as a result of the factors considered. Based on the forecast analysis; the following points are made:

- The aircraft based at Seward are similar in design characteristics and could be served by an airport designed to the standards for Aircraft Design Group (ADG) I, Approach Category A, with a runway length of 3,300 feet (see table below, Scenario 1).
- Seward has a demonstrated special need for the medevac aircraft (King Air B-200) used by three of the air ambulance companies serving Seward. If the King Air B-200 is used as the critical design aircraft, the airport design standards increase to ADG II. See Scenario 2 in the table below.
- Pilots and local officials expressed the desire for a runway that can accommodate small charter jets for tourism, emergency preparedness, and search and rescue aircraft such as the Coast Guard C-130, and for potential scheduled air service. The C-130 and small charter jets are not forecasted to meet the federal threshold of regular use. These aircraft, however, have used Seward in the past and owners continue to desire the ability to land. Anecdotal information indicates that up to 20 small charter jets per year have landed at Seward in the past. Scenario 3 in the table represents the facility dimensions required to meet this desire if the planes are not fully loaded.

Runway Dimensional Standards for Various Scenarios

Feature	Current Based Aircraft Group (Scenario 1)	Current Demand & Medevac (King Air B200) (Scenario 2) RECOMMENDED	Growth Scenario & Emergency Preparedness (Beech 1900) (Scenario 3)	Existing (R/W 13/31)
Approach Category	A	B	B	B
ADG	I	II	II	II
Runway Length	3,300 feet	3,300 feet(1)	4,000/4,700 (1)feet	4,533 feet
Runway Width	60 feet	75 feet	100 feet	100 feet

(1) The Forecast and Facility requirements document provides documentation on runway length analysis.

Considering the modest growth, the medivac aircraft use and the funding source, the facility requirements for Scenario 2 is recommendation for this project. However in considering development layouts to meet Scenario 2, Scenario 3 should be considered for the future. Seward has a number of activities that could cause an increase to airport operations beyond the forecasted growth. If these potential economic development activities come to fruition, Scenario 3 would accommodate larger aircraft that maybe added to the fleet mix to accommodate the demand for commuter aircraft.

The technical memo also discusses the difficulties with developing an approach with greater minimums to allow more reliable aircraft service during poor weather conditions and analyzes the wind coverage. The wind analysis reveals that a single runway oriented between 156 and 204 degrees north azimuth provides the wind recommended by FAA guidance. Runway 16-34, oriented at 183 degrees provides 98.6% wind coverage for ADG I aircraft, whereas Runway 13-31 provides 91.1% coverage.

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Transforming Challenges into Solutions

TECHNICAL MEMORANDUM

Prepared for	Barbara Beaton, Aviation Project Manager Alaska Department of Transportation and Public Facilities	**Date**	July 14, 2015
Client #/PDC #	54857/14075FB	**Prepared by**	Ken Risse, PE; Patrick Cotter, AICP; Royce Conlon, PE
Project Name	Seward Airport Improvements	**Reviewed by**	Royce Conlon, PE
Subject	***Final Aviation Activity & Facility Requirements***		

This technical memorandum presents the aviation demand forecast effort and resulting facility requirements. The facility requirements set the stage for development of design alternatives by establishing the runway design code, which determines the airport's dimensional requirements (runway width, length, offset from parked aircraft, etc.).

This technical memo represents an interim review document. Once reviewed and coordinated with DOT&PF, it will be incorporated into the scoping report.

In this memorandum we translate the aviation forecasts into facility requirements by comparing future facility needs to the airport's existing inventory of facilities, reviewing Federal Aviation Administration (FAA) design criteria to ensure the airport meets safety and operational standards, and considering the need to maintain and improve aviation service for the community of Seward.

This document is focused on key elements of the airport that will drive the alternative development and evaluation process, with brief discussion of other secondary facility elements. A more comprehensive analysis will be presented in the scoping report.

Forecast of Aviation Activity

Forecasts of future levels of aviation activity are the basis for making decisions in airport planning and development. A comprehensive forecast includes elements of socioeconomics, demographics, geography, and external factors. Recent interest in Seward by the fishing and marine industries has sparked anticipation of growing industrial development in the community.

The FAA is providing the majority of the funding for the improvements and as such FAA regulations and guidance are used as the basis of this report. The methodology used in this forecast is based on the process recommended in FAA AC 150/5070-6B, *Airport Master Plans*, and in the supplemental FAA publication, *Forecasting Aviation Activity by Airport*. These documents provide national guidance for the development of airport master plans and have been used since enactment of the Airport and Airway Development Act of 1970.

Recommended steps include:

- Step 1 – Identify aviation activity measures
- Step 2 – Collect and review previous airport forecasts
- Step 3 – Gather data
- Step 4 – Select forecast methods
- Step 5 – Apply forecast methods and evaluate results
- Step 6 – Compare forecast with Terminal Area Forecast (TAF)

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Step 1 – Identify Aviation Activity Parameters and Measures to Forecast

The level and type of aviation activity anticipated at an airport, as well as the nature of the planning to be done, determine the factors to be forecasted. Generally, the most important activities for airfield planning are **aircraft operations** and the **fleet mix**, since these define the runway and taxiway requirements. Plans for general aviation (GA) airports require forecasts of aircraft operations and based aircraft to define runway, taxiway, and aircraft parking requirements.

Practical considerations dictate the level of detail and effort that should go into an airport planning forecast. Air traffic activity at Seward comprises single and twin-engine GA aircraft, medevac aircraft, military aircraft, and helicopters. Because this project centers on runway improvements, the forecast for Seward Airport (SWD) will focus on:

- Aircraft operations – an aircraft landing or takeoff; one flight to and from the same location counts as two operations.
- Based aircraft – the total number of active general aviation aircraft that use an airport as a home base.
- Fleet mix – describes the makeup of the different aircraft in use at an airport.

Step 2 – Collect and Review Previous Airport Forecasts

Relevant forecasts of aviation activity at Seward are summarized below.

Seward Airport Master Plan (2008)

In 2008, the DOT&PF updated the Seward Airport Master Plan. This update forecasted aircraft operations and passenger enplanements as summarized in the following table. An annual growth rate of 1.2% was used to forecast future operations, enplanements, and cargo. An enplanement is defined as a passenger boarding.

Table 1 - 2008 Seward Airport Master Plan Aviation Forecast, Moderate Growth Scenario

	2003 (Base)	2008	2013	2018	2023
Enplanements	3,746	3,976	4,221	4,480	4,755
Commercial Operations	2,912	3,091	3,281	3,483	3,697
GA Operations	2,475	2,627	2,789	2,960	3,142
Military Operations	75	—	—	—	—
Cargo (lbs)	4,000	4,416	4,876	5,383	5,944

Alaska Aviation System Plan (2008)

The Alaska Aviation System Plan (AASP) is a component of DOT&PF's Statewide Transportation Plan. Most recently updated in 2008, the AASP contains forecasts of enplanements, cargo, operations, and based aircraft for 2015, 2020, and 2030. The AASP has a complex forecasting methodology that combines historical data with population projections, expendable income, and other economic considerations, as well as gradual transformation in the aircraft fleet. The equations for forecasting enplanements, cargo, and operations differ, and growth factors are also different for each period. The forecast for the 2008 update was completed and published in 2011 using 2008 as the base year. Details of the methodology are documented in the AASP.

Table 2 - Alaska Aviation System Plan Forecast, Seward Airport

Seward	2008 (Base)	2015	2020	2030
Enplanements	22	23	25	29
Cargo	None	None	None	None
Critical Aircraft	Cessna 185			
Aircraft Operations				
Commercial	4,500	4,136	4,318	4,576
GA	6,000	5,932	6,211	7,133
Military	10	10	10	10
Total Operations	**10,510**	**10,178**	**10,539**	**11,719**
Based Aircraft				
Single engine	28	29	29	31
Multi-engine	0	0	0	0
Helicopter	0	0	0	0

FAA Terminal Area Forecast

The FAA Terminal Area Forecast (TAF) is the official FAA forecast for aviation activity for U.S. airports. The TAF for Seward Airport is summarized in Table 3. The TAF includes passenger enplanements, aircraft operations, and based aircraft. A local operation is performed by a based aircraft, whereas an itinerant operation is performed by an aircraft not based at the airport; another term often used for itinerant operations is transient operations.

Table 3 - FAA Terminal Area Forecast (2013) Seward Airport

Passenger Enplanements			Itinerant Aircraft Operations				Local GA Ops	Total Ops
Air Carrier	Commuter/ Air Taxi	Total	Air Carrier	Commuter/ Air Taxi	GA	Military		
0	9	9	0	4,500	4,000	10	2,000	10,510

The U.S. Department of Transportation (DOT) is the main source of airport statistics. U.S. scheduled and non-scheduled certified air carriers, commuter air carriers, and small certified air carriers submit data to DOT on Form 41 Schedule T-100 (simply referred to as T-100 data). The unusually low number of commuter/air taxi enplanements compared to the number of operations is likely due to the lack of scheduled commercial service to SWD. This means enplanements are not recorded in the T-100 database, which may account for the low number.

National Plan of Integrated Airport Systems (NPIAS)

The NPIAS presents a five-year forecast of enplaned passengers and based aircraft. The current NPIAS forecast for Seward (for the years 2013-2017, using 2011 as the base year) is presented in Table 4.

Table 4 - NPIAS Forecast Year 2017

Enplanements	8
Based Aircraft	25

Step 3 – Gather Data

The FAA requires master plan forecasts to incorporate the number of aircraft operations for various categories of aircraft. Passenger enplanement, cargo, mail, and freight data are also recommended, and the governing Advisory Circular (AC) specifies that population, employment rates, and socio-economic factors be included, as any of these can also affect the forecast.

Historical air traffic data for Seward were collected from FAA's Airport Master Record Form 5010, the FAA TAF, the NPIAS, the USDOT Bureau of Transportation Statistics, the AASP, and the 2008 Airport Master Plan. Data also came from interviews with airport users, potential airport users, medevac providers, and Seward-based industry. Air traffic operations at Seward Airport are not recorded on site because there is no air traffic control tower. Because of this, GA activity is likely underreported. Also, local residents have reported that after the recent airport flooding events, aviation activity has slowed. The magnitude of this would be difficult to define given the airport is not towered and there are no reporting requirements. Aviation activity at Seward is predominantly unscheduled GA and air taxi flights, with consistent medevac and occasional military use.

Passengers

Passenger traffic at Seward Airport (SWD) has remained low over the past decade. The T-100 database shows fewer than 30 passengers per year since 2004 (see Table 5).

It should be noted that scheduled passenger service was discontinued in 2002.

Table 5 – Historic SWD Commuter Passenger Enplanements, 1990-2013

Year	Passengers	Year	Passengers
1990	2218	2002	15
1991	598	2003	0
1992	1073	2004	20
1993	127	2005	1
1994	1073	2006	7
1995	587	2007	26
1996	846	2008	22
1997	1373	2009	18
1998	1331	2010	9
1999	583	2011	22
2000	512	2012	8
2001	338	2013	0

Freight and Mail

The USDOT T-100 data show no history of freight or mail passing through SWD. Mail and cargo are most frequently transported via highway or rail. With the proposed expansion of the shipyard by Vigor Alaska, air cargo may increase in the future; see the Economic Activity discussion below.

Based Aircraft

The FAA Airport Master Record Form 5010 lists 25 single-engine aircraft based at SWD. This number concurs with previous forecasting efforts and interviews with airport users.

Aircraft Operations

There are two primary sources of aircraft operations for Seward Airport: the FAA's Form 5010, *Airport Master Record*, and the FAA TAF. These data are presented in the table below. The FAA TAF for SWD dating back to 1980 has not changed (see attachment). The list has reported 10,510 operations for each year, broken down as shown in Table 6.

Table 6 - Aircraft Operations

Source	Air Carrier	Air Taxi	GA Local	GA Itinerant	Military
Form 5010	0	4,500	2,000	4,000	10
TAF	0	4,500	2,000	4,000	10

Fleet Mix Table 7 lists the types and Aircraft Design Group (ADG) of aircraft that landed at SWD at least once during the period from 2007 through 2013.

Table 7 - Current (2013) Fleet Mix Using Seward Airport

Operator	Aircraft	ADG	Use
LifeMed	A-Star helicopter King Air B200	N/A II	Medevac
LifeFlight	King Air B200	II	Medevac
Guardian	King Air B200	II	Medevac
Scenic Mountain Air	Cessna 172	I	Flight seeing/air taxi
Seward Air	Super Cub PA-18	I	Personal
Private	Cessna 172 Super Cub PA-18	I I	Personal
Private	Cessna 170	I	Personal
Grant Aviation	B200	II	Air Taxi/Charter
Homer Air	Cessna C206/207/209/210 Stationair	I	Air Taxi/Charter
Smokey Bay Air	Cessna C206/207/209/210 Stationair	I	Air Taxi/Charter
Iliamna Air Taxi	Pilatus PC-12	II	Air Taxi/Charter
Island Air Service	Cherokee 6	I	Air Taxi/Charter
Alaska Central Express	Beech 1900	II	Air Taxi/Charter
Era Aviation	Beech 1900	II	Air Taxi/Charter
Frontier Flying Service	Beech 1900	II	Air Taxi/Charter
Warbelow	Cessna 172	I	Air Taxi/Charter
Wright Air Service	Cessna 208 Caravan	II	Air Taxi/Charter

US DOT T-100 data were acquired and reviewed (see attachment). No flights for Seward were listed in the 2013 data, potentially due to the runway flooding and subsequent weight restrictions- of 12,500 lbs placed on the main runway.

The Kenai Peninsula Aviation Superintendent provided a list of large aircraft, either meeting or exceeding the weight restrictions, that requested permission to land at Seward in 2013.

- Lear 35 (ADG C-I): 11 requests
- King Air B200 (ADG B-II): 16 requests
- Gulfstream 5 (ADG C-III): 4 requests
- DC-6 (ADG B-III): As needed

The King Air B200 maximum landing and takeoff weight is 12,500 lbs., so this aircraft was unaffected by the weight restrictions.

In addition to the above fleet mix, the U.S. Coast Guard uses SWD for search and rescue activities and also for pilot training for short field landings with the C-130 (an ADG IV aircraft). Helicopters used include the H-60 and H-65.

Step 4 – Select Forecast Methods

While there are several acceptable techniques and procedures for forecasting aviation activity at a specific airport, most forecasts utilize basic statistical techniques such as linear regression, exponential smoothing, or share analysis. To determine which method is most appropriate, it is important to look at factors affecting aviation demand. The following discussion is an overview of the factors affecting aviation demand at Seward and the forecast method applied.

Economic Activity

An analysis of socioeconomic activity is usually helpful in developing a forecast of aviation demand. Projected increases in population or economic activity can lead to increased use of an airport.

The following section highlights major factors anticipated to contribute to socioeconomic growth in Seward. These include:

- Population forecasts
- Possible relocation of Coastal Villages Region Fund (CVRF) Community Development Quota (CDQ) Fleet to Seward
- Use of Seward as the homeport for *R/V Sikuliaq*, a marine research vessel
- Vigor Alaska's purchase and planned expansion of Seward Drydock
- Tourism

Population

The population of Seward has grown steadily over the past 14 years to a current population of 2,754 (see Figure 1). The compound annual growth rate over this time period is 1.23%, which is higher than the Alaska Department of Labor and Workforce Development's projected growth rate of 0.5% for the Kenai Peninsula Borough as a whole (Alaska Department of Labor and Workforce Development, 2014).

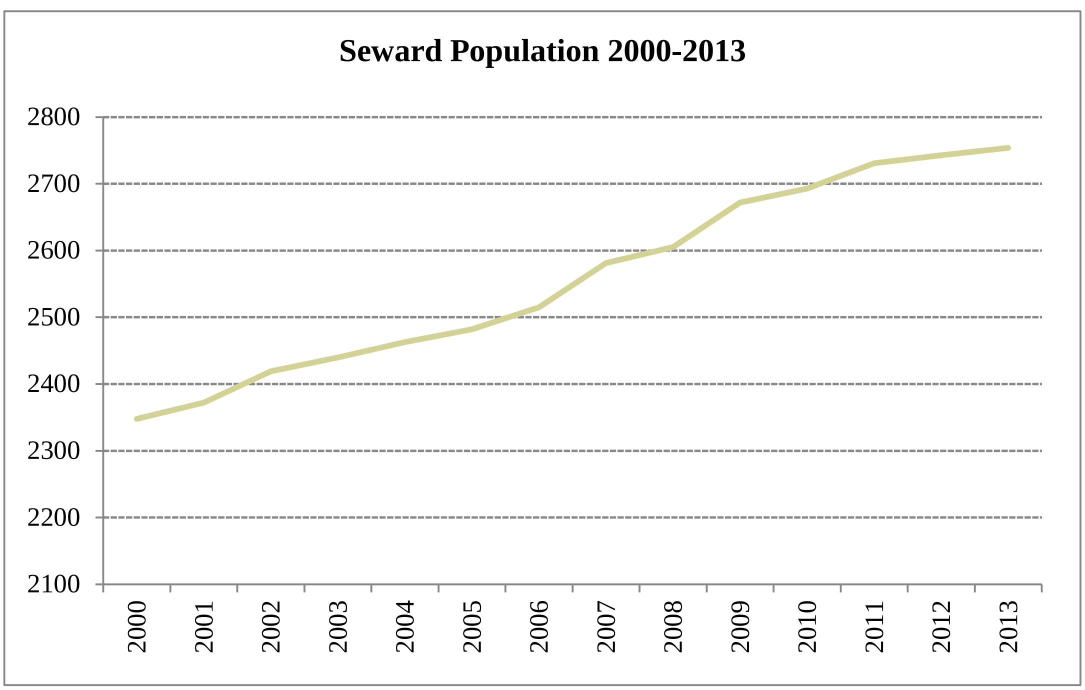

Figure 1 - Historic Seward Population, 2000-2013

Coastal Villages Region Fund CDQ Fleet

The CVRF represents 20 western Alaska communities in the CDQ fishery. The CDQ's purpose is to:

- Provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area
- Support economic development in western Alaska
- Alleviate poverty and provide economic and social benefits for residents of western Alaska
- Achieve sustainable and diversified local economies in western Alaska

The City of Seward has been actively trying to homeport the CDQ fleet in Seward rather than Seattle. The CVRF has partnered with Seward to develop the Seward Marine Industrial Center (SMIC) support facilities. The SMIC will increase the available moorage, warehousing space, and upland areas to accommodate the CDQ fleet.

If the CVRF decides to homeport in Seward, the airport could see increased activity during spring deployment of the CDQ fleet when crews return to Seward. Based on the number of ships in the CDQ fleet, the number of potential crew members, and an assumed percentage that might fly into/out of Seward, this could result in approximately 500 enplanements twice a year.

R/V Sikuliaq

The City of Seward reported that the SMIC is the homeport for the 260-foot *R/V Sikuliaq*. This Alaska Region Research Vessel, commissioned in March 2014, is one of the most advanced university research vessels in the world. The *Sikuliaq* is owned by the National Science Foundation (NSF) and operated by the University of Alaska Fairbanks (UAF) as a part of the University-National Oceanographic Laboratory System's academic research fleet. The *Sikuliaq* is the first vessel in the U.S. academic research fleet capable of breaking ice up to 2.5 feet thick, making it uniquely equipped for polar and sub-polar research.

According to the City of Seward, an increase in aircraft operations between Anchorage and Seward could occur to equip, supply, and man this vessel for its voyages.

Vigor Alaska

In early 2014, Vigor Alaska announced the purchase of Seward Ship's Drydock. According to the press release, "the purchase will bring the strength of Vigor's physical, financial and human capital to bear on the yard, which will empower the yard to land more projects and larger-scale projects, translating to more work and sustainable employment for Alaska residents. In addition, Vigor will leverage its existing strong public/private partnerships in Alaska to maximize opportunities for the Seward yard."

Vigor Alaska has provided a letter of support for airport rehabilitation and improvements, stating that “Shipyards rely on timely and affordable transportation and logistics to be competitive in today’s economics.” Further, the letter says that Vigor’s operations depend on specialized production personnel who travel between their six other shipyards, as well as an array of support contractors, vendor technicians, and inspectors. Time is money. Vigor indicates the five-hour round-trip drive from Anchorage is problematic and poses dangerous winter driving conditions as well as closures due to avalanche. (See attachment for copy of the letter of support, dated January 2015).

It is conceivable that this industry buildup would increase demand for more frequent chartered air service or even scheduled service between Seward and Anchorage. The aircraft type that may be charted would depend upon whether the charter was to be cargo or passengers and the number of passengers.

Tourism

Tourism is a major component of Seward’s economy. Cruise ships, the railroad, and personal vehicles all bring tourists to the community. Attractions include Kenai Fjords National Park, the Alaska Sealife Center, the Mount Marathon Race, and Exit Glacier. Tourist activities include flightseeing, sportfishing, hiking, wildlife cruises, and sled dog demonstrations.

Seven main cruise lines will serve Seward in 2015: Holland America, Norwegian, Silver Sea, Celebrity, Regent, Crystal, and Royal Caribbean. Cruise ships in port can nearly double the population of the community. Many cruisers embark or disembark in Seward with connections to/from Anchorage, Denali, and Fairbanks via buses or the Alaska Railroad. The number of scheduled dockings is up from 53 in 2014 to 63 in 2015, with an increase in passenger capacity from 67,912 to 91,230. The 34% increase in passengers appears to come not only from the 10 additional dockings, but also through a shift towards larger ships.

Flightseeing activities generally consist of small fixed-wing aircraft tours of the surrounding mountains, glaciers, and ocean. Typical aircraft are Cessna 172 or similar. The increase in passengers could cause an increase in the number of tourism-related flights.

Alaska Railroad (ARRC) Facility Improvements

The ARRC is planning a substantial investment and improvements in the port and rail facilities adjacent to the airport. During a project coordination meeting and again at the November Seward Working Group (SWG) meeting, ARRC staff indicated that if the airport had regularly scheduled flights, ARRC would prefer to have its crews and management teams who occasionally commute to/from Seward fly versus traveling by rail or highway. Travel time and safety were the primary reasons cited. The specific number of enplanements this would add is undetermined, but could be substantial if reliable services could be provided.

Gas Line Construction

Seward experienced significant activity during the construction of the Trans-Alaska Pipeline in the 1970s. Most of the pipe was shipped through the port of Seward. During a project co-ordination meeting, ARRC staff predicted that if a new gas pipeline were constructed through Alaska, activity through the combined port/rail terminal would increase. This would also likely increase activity at the Seward Airport. This construction impact would be transitory, however. Short-term effects such as this normally do not drive long-term investment in airport facilities, especially if other (albeit less efficient) modes of transportation can meet the demand.

Other Oil & Gas Related Activity

Seward's ice-free deep sea port and shipyard capabilities combined with gas and oil exploration and potential development in the Outer Continental Shelf make Seward a desirable port for use by oil companies such as Shell to maintain and store marine vessels. Like Vigor Alaska and the ARRC, Shell Oil has indicated air travel demand could increase with its presence. "An upgrade to the existing airport would permit Shell to factor charter air transportation of material and personnel more aggressively than in the past to support our current operations while introducing a strong planning factor for future operations." (See attached letter of support.)

Medevac Operations

The term "medevac" is an abbreviation for "medical evacuation." This and other terms referring to a type of medical emergency response (e.g., "helicopter emergency medical service" and "air ambulance") are used interchangeably in the United States. The value of air access to remote locations or in the event of an emergency is not generally recognized until it occurs, and it is difficult to place an economic value on such capabilities. Often, the primary means of reaching a community immediately after a major act of nature such as a flood, earthquake, wildfire, or landslide is via air transport.

Both fixed wing aircraft and rotary wing aircraft (helicopters) are used in medical emergency response situations. Patients are flown by fixed wing aircraft for many different reasons. These can range from the stable patient involved in an accident or with a long-term medical condition wishing to relocate closer to family for rehabilitative care to the critical heart failure patient requiring intensive-care transfer to receive a transplant. The fixed wing environment differs from the rotary wing environment primarily in that fixed wing aircraft travel farther, faster, and higher. The fixed wing aircraft is primarily a long-distance facility-to-facility transport and includes a range of multi-engine turboprop and small jet aircraft specially equipped and staffed to respond to patient needs while en route. Rotary wing service is typically engaged for moving a patient from an accident or incident scene to a trauma center and for air transport of stable patients; the helicopters are also suitably staffed and equipped for these missions.

Not all medevac transport is associated with an emergency situation. Many medevacs involve medically appropriate, hospital-to-hospital transport on a scheduled basis. Therefore, medevac service providers are actively engaged in both emergency response and critical care transport.

Air transportation of patients between Seward and Anchorage is fairly common. Although Seward is connected to Anchorage via the highway system, the local volunteer ambulance service does not have enough staff to transport patients to Anchorage. Therefore, fixed-wing aircraft and helicopters are used for medevac transport.

Three medevac operators currently provide service to Seward: LifeFlight, LifeMed, and Guardian. LifeMed and Guardian are the most common medevac operators at SWD, with approximately 300 annual operations combined.

Table 8 - Medevac Operations at SWD

Medevac Operator	Aircraft	Estimated Annual Operations
LifeMed	King Air B200[1]	60
LifeMed	A-Star Helicopter	140
Guardian	King Air B200	100
LifeFlight	King Air B200	40

LifeMed and Guardian also utilize Lear Jets for medevacs. Those aircraft require 5,000 feet of runway length and are therefore not used at SWD. Discussions with medevac operators, however, did indicate that Lear Jets based in Anchorage would be utilized for approximately half of the medevacs if the runway were longer and the instrument approach were better.

Commuter Travel

Seward has not had scheduled air service since 2002. Recent contact with Alaska Airlines and RAVN Alaska, the two air operators most likely to offer commuter service, indicate they have no plans (within the foreseeable future) to offer scheduled service. When asked what would trigger the addition of SWD to their schedule, RAVN replied demand and a better approach to ensure they could offer reliable service.

RAVN does provide charter service to SWD, generally in support of the cruise ship industry. Also, RAVN provides scheduled service to Homer and Kenai Airports. A brief analysis was conducted to compare and contrast Seward with Homer and Kenai to evaluate potential for future air service to SWD.

Table 9 – Comparison with Homer and Kenai

Community	Airport	Population	Distance/Drive Time	Commercial Flights
Seward (+ Moose Pass)	SWD	5,775	127 miles/2.5 hours	0
Kenai (+ surrounding contributing communities)	ENA	33,489	157 miles/3.25 hours	10 daily
Homer (+ surrounding area)	HOM	8,408	224 miles/4.5 hours	5 daily

Homer and Kenai have better instrument approach capabilities than Seward. Homer has six published approaches with as low as one mile visibility and minimum descent altitude of 437 feet (389' height above touchdown). Kenai has six published approaches with as low as one half mile visibility and minimum descent altitude of 298 feet (200-foot height above touchdown). Seward has a single circling approach for aircraft approach categories A and B only, with as low as 1-1/4 mile visibility and minimum descent altitude of 2,660 feet (2,638-foot height above touchdown).

The anticipated economic growth in Seward improves the probability of an air carrier increasing service to Seward. Improved approach procedures with lower minimums would also increase the likelihood of scheduled air service. Conversations with FAA Flight Standards indicate an improved public approach would be difficult if not impossible to design in Seward. However an improved special approach designed for an individual carrier or for specially qualified aircrew and equipment may be possible. Such special procedures are expensive to have designed, so an air carrier or other sponsor would only be likely to pursue a special procedure if they felt reasonably assured that the cost would be outweighed by profit or benefit.

[1] The King Air B200 is a fixed-wing aircraft.

Initially, carriers would most likely serve Seward with charter aircraft, but if reliable air transportation is available, demand may increase over the next 20 years to make scheduled service with the larger commuter aircraft currently flying into Kenai and Homer a feasible option, at least seasonally. Kenai is presently served on a regular basis by the Beech 1900 (B-II) and Dash 8 (C-III) aircraft, and Homer is served by the Beech 1900.

Emergency Preparedness

A larger runway supports emergency preparedness. Although Seward is connected to other communities by rail, road, and the marine highway, the airport provides essential access during emergency or disaster situations when other access (single rail line and single highway) may be vulnerable. Reportedly, during the 1964 earthquake, the airport was minimally damaged but remained the only connection with the rest of Alaska for an extended period of time because the railroad, the Seward Highway, and the port facilities were completely destroyed (Seward Airport Master Plan, Phase II, Hydrology Report, by Skip Barber, July 25, 2006).

The U.S. Coast Guard (USCG) has landed C-130s at Seward in the past and would continue to use this aircraft at Seward if the pavement strength allowed it to land. The C-130 is an ADG IV aircraft used for support of search and rescue and for medical evacuation of mass casualties. The C-130 is not forecast to meet the threshold of regular use (500 annual operations), but it is extremely useful during emergencies such as avalanches, earthquakes, or flooding that disrupt road access to Seward. The USCG indicated that with a runway length of 4,500 feet they can normally operate at about 120,000 lbs., allowing enough fuel and gear to respond to most situations. The H-60 helicopters could also be used for mass casualty response, but the C-130 can respond more quickly; additionally, if the H-60 needed fuel, the C-130 could provide it. (See attached e-mail, 8/14/2014, LT Robert Hornick, C-130 Assistant Operations Officer.)

Forecast Method

The most demanding aircraft (largest wingspan and longest required runway length) currently using the airport regularly is the **King Air B200**, which is used for medical evacuations. While the annual operations of the medevac aircraft alone do not meet the FAA threshold of 500, the B200 is a part of the family of B-II aircraft serving Seward. Other ADG II aircraft operating in Seward are the air taxi and charter aircraft listed in the fleet mix (Table 7). Air taxi, charter, and medevac operations can be expected to increase as the population increases. The population of Seward has historically grown at 1.23%. The population of the entire Kenai Peninsula Borough is forecast to grow at 0.5% annually. Seward has the potential to grow even faster if the economic factors discussed begin to materialize (Vigor Alaska, tourism, SWD Marine Center, CDQ fleet, ARRC, and offshoots of gas and oil activities). Following consultation with the Seward Working Group, it was decided that a 1.23% growth rate would be used, but that a higher growth scenario using 2% could be conceivable. Table 10 presents forecasts with both growth rates.

Step 5 – Apply Forecast Methods and Evaluate Results

With a either a 1.23% or 2.0% annual growth rate, SWD will see modest growth in aircraft operations (Table 10), with general aviation continuing to be the dominant type of operation.

Table 10 - Forecast Operations at SWD at 1.23% growth/*2.0% growth*

Operations	Base Year 2013	+5 Years	+10 Years	+15 Years
Local GA	2,000	2,127 / *2,208*	2,260 / *2,438*	2,402 / *2,693*
Itinerant GA	4,000	4,252 / *4,417*	4,520 / *4,877*	4,805 / *5,387*
Medevac	200	213 / *220*	228 / *2,43*	243 / *268*
Air Taxi/Charter	4,500	4,783 / *4,969*	5,085 / *5,485*	5,406 / *6,056*

Step 6 – Compare Forecast with TAF

The base year data used in this forecast are consistent with the TAF. The TAF shows no change in aircraft operations at SWD throughout the planning period, however, which will likely not be the case. Table 11 summarizes the differences between the 1.23% growth forecast and the TAF.

Table 11 - Forecast - TAF Comparison

	2018			2023			2028		
	Forecast	**TAF**	***Difference***	**Forecast**	**TAF**	***Difference***	**Forecast**	**TAF**	***Difference***
Local GA	2,127	2,000	***127***	2,260	2,000	***260***	2,402	2,000	***402***
Itinerant GA	4,252	4,000	***252***	4,520	4,000	***520***	4,805	4,000	***805***
Air Taxi/ Charter	4,783	4,500	***283***	5,085	4,500	***585***	5,406	4,500	***906***

Facility Requirements

The facility requirements depend on the critical design aircraft or group of aircraft. With the increasing economic activity and population in Seward, the fleet mix providing the air taxi and charter operations will likely include a greater percentage of the larger B-II aircraft. There is a good probability that over 500 operations of the B-II family of aircraft will result from these changes. Thus, the Seward Airport facilities should meet the B-II facility standards. This standard is consistent with the 2008 Airport Master Plan and approved Airport Layout Plan. A minimum runway length of 3,300 feet is needed to serve the existing based aircraft and medevac operations. A longer, 4,000-foot runway should be considered long term to accommodate the potential demand for commuter aircraft such as the Beech 1900 and/or the Dash 8.

Wind Coverage

Wind conditions affect aircraft in varying degrees. Generally, the smaller the aircraft, the more it is affected by wind, particularly crosswinds, which are often a contributing factor in small aircraft accidents. The FAA provides the following guidance on maximum crosswind components for small to medium-sized aircraft.

Table 12 – Allowable Crosswind Components by Aircraft Design Group

Aircraft Design Group	Allowable Crosswind Component
ADG I Cessna 170, 185, 206	10.5 knots
ADG II Beech 200, 1900; Cessna 208, Grand Caravan	13 knots
ADG-III DC-6, Dash 8, 737	16 knots

Wind coverage is the percentage of time crosswind components are below an unacceptable velocity. A runway oriented to provide the greatest wind coverage with the minimum crosswind components is preferred. The desirable wind coverage for an airport is 95%. A second (crosswind) runway is recommended when the primary runway orientation provides less than 95% wind coverage.

Based on the current wind data available for Seward, a single runway oriented between 156 and 204 degrees north azimuth provides 95% or greater wind coverage (for ADG I aircraft, which have the least tolerance for crosswinds).

- Runway 16-34 is oriented at 183 degrees, providing 98.6% wind coverage for ADG I aircraft.
- Runway 13-31 is oriented at 146 degrees, providing 91.1% coverage for ADG I aircraft and 96.0% coverage for ADG II aircraft.

Aircraft Use at Seward

The based aircraft at Seward are similar in design characteristics and could be served by an airport designed to the standards for ADG I, Approach Category A, with a runway length of 3,300 feet or less for small (under 12,500 lb.) aircraft. In addition, the Alaska Aviation Preconstruction Manual identifies a minimum runway length of 3,300 feet for community class airports such as SWD. This is the minimum runway length under consideration.

Seward has experienced a large number of medivac aircraft operations over the years. The King Air B-200 (used by three of the air ambulance companies) serves the community. If the King Air B-200 is used as the critical design aircraft, the airport design standards increase to ADG II. US DOT T-100 statistics indicated other ADG II aircraft using Seward Airport in the past 5 years include the Beech 1900, Cessna 208 Caravan, and Pilatus PC-12. Although a 3,300 feet runway would serve the existing based aircraft and medevac operations, the facility should have a long-term plan to accommodate a runway length up to 4,000 feet to support commuter aircraft such as the Beech 1900 and/or the Dash 8.

Pilots and local officials expressed the need for a runway that can accommodate small charter jets for tourism, emergency preparedness and search and rescue aircraft such as the Coast Guard C-130, and potential scheduled air service.

The C-130 and small charter jets are not forecast to meet the threshold of regular use, but they have been used at Seward in the past and pilots continue to request to land them. FAA does not fund public airports to support military or other federal agency operations or aircraft. The Coast Guard needs to provide funding if this activity drives airport improvements.

Anecdotal information indicates that up to 20 small charter jets per year have landed at Seward in the past. A 4,000-foot runway could support this occasional demand, if the aircraft is not fully loaded. (see attachments for runway length information provided by NetJet) Beyond the current project planning horizon further lengthening and widening of the facility could be considered.

Airfield Requirements

Runways Given the number of operations and amount of growth anticipated in Seward, a greater growth factor in the forecast of operations (2% vs 1.23%) would not show an increase great enough to warrant substantial changes in the facility requirements (such as a second runway or parallel taxiway). A single runway can handle between 62,000 and 131,000 operations annually based on VFR conditions and calculations with a taxiway located at the runway midpoint and airport open for operation 8 to 12 hours per day, 5 to 7 days per week. This is significantly more operations than projected. Parallel taxiway systems to help improve runway capacity and minimize user delays are typically not warranted until annual operations approach 20,000.

Facility requirements are listed in the table below for three potential groups and compared with the larger of the two existing runways. Data collected and analyzed in this document supports the "Current Demand & Medevac" scenario. Currently, there is an insufficient number of operations by large aircraft to support the "Growth Scenario & Emergency Preparedness" column in the chart below. That scenario is included for future planning purposes.

Table 13 – Runway Dimensional Standards for Various Scenarios

Feature	Current Based Aircraft Group	Current Demand & Medevac (King Air B200) Recommended for Near-Term Development	Growth Scenario & Emergency Preparedness (Beech 1900) Consider for Long-Term Development	Existing RW 13-31
Approach Category	A	**B**	B	B
ADG	I	**II**	II	II
Runway Length	3,300' (Note 1)	**3,300' (Note 1)**	4,000'/4,700' (Note 2)	4,533'
Runway Width	60'	**75'**	75' (Note 3)	100'
Visibility Minimums	1 mile	**1 mile**	1 mile	1 mile
Crosswind Component	10.5 knots	**13 knots**	16 knots	13 knots
Runway Safety Area	120' x 3,780'	**150' x 3,900'**	150' x 5,300'	150' x 4,749'
Object Free Area	400' x 3,780'	**500' x 3,900'**	500' x 5,300'	500' x 4,749'
RPZ	1,000' x 500' x 700'	**1,000' x 500' x 700'**	1,700' x 500' x 1,010'	1,000' x 500' x 700'
Part 77 Primary Surface	500' x 3,700'	**500' x 3,700'**	500' x 5,100'	500' x 4,649'
Part 77 Approach Slope	20:1 (Visual)	**20:1 (Visual) (Note 4)**	20:1 (Visual) (Note 4)	20:1 (Visual)

1. Minimum runway length for community airports per Alaska Aviation Preconstruction Manual exceeds FAA AC 150/5325-4B (2,750 feet for 95% of fleet or 3,250 feet for 100% of fleet) and King Air B200 published takeoff and landing distances.

2. The 4,700-foot runway length is based on FAA AC 150/5325-4B for aircraft over 12,500 lbs. but less than 60,000 lbs. (75% of fleet at 60% useful load). The FAA is circulating a Draft AC 150/5325-4C, which recommends using manufacturer's airport planning manuals for all large airplanes (over 12,500 lbs.). The Beech 1900D specification and performance sheet lists a takeoff length of 3,737 feet. Discussions with the primary air carrier in Alaska using this aircraft indicated a need for a 4,000-foot runway to accommodate it. A 4,000-foot runway option is being considered, which would accommodate the Beech 1900 and other large aircraft such as the Dash 8 and Sherpa.

3. Runway width may be increased to 100 feet to provide for larger emergency response aircraft such as the C-130.

4. By definition, a non-precision instrument (NPI) approach runway means a straight-in approach is planned or has been approved (Part 77.2). SWD's approach is currently a circling approach (RNAV [GPS]-A). Review of the FAA flight standards and local topography indicates a straight-in approach is not viable at Seward due to the mountainous terrain on all sides.

Taxiways / Taxilanes

Taxiways should be upgraded to meet the current standards. Major changes to taxiway standards have been made in the revisions to AC 150/5300-13 and AC 150/5300-13A since the design of the current airport. It will be critical to establish the design aircraft to be used for taxiway geometry, as taxiway design requirements are no longer established solely by the airplane design group, but also depend on the wheelbase and distance between the cockpit and main landing gear of the design aircraft.

Current guidance also indicates the taxiway intersections with runways should avoid the middle one third of the runway length, which ¶401.b(5)(d) defines as a "high energy" intersection. "By limiting runway crossings to the outer thirds of the runway, the portion of the runway where a pilot can least maneuver to avoid a collision is kept clear." Taxiways A and D currently conflict with this guidance.

Further, taxiways providing direct access from the aircraft parking areas to a runway should be avoided (¶401.b(5)(g) and ¶503.). Taxiways C, D, E, and F currently conflict with this guidance. Future layouts should consider correcting this deficiency.

The key minimum dimensional standards for taxiways that need to be considered in developing the layout of facility improvements are listed in the table below.

Table 14 – Taxiway and Taxilane Design Dimensions Based on Aircraft Design Group (per AC 150/5300-13A; Table 4-1)

Feature	Near Term & Ultimate – B-II (King Air B200 & Beech 1900)	Existing
Runway to Taxilane Separation	240'	184' (Note 1)
Taxiway Safety Area	79'	79'
Taxiway OFA	131'	131'
Taxilane OFA	115'	131'
Taxilane Centerline to Fixed or Movable Object	57.5'	
Taxilane Wing Tip Clearance	18'	

1. Separation distance shown on 2008 ALP between Runway 16/34 centerline and GA apron taxilane (A-I small requires 150 feet).

To meet the dimensional standards above and preserve the existing Building Restriction Line (BRL) and GA apron size, a runway parallel to the apron (Runway 16-35) would need to have a runway-to-BRL separation of 394.5 feet; the existing Runway 16-35 is separated from the BRL by only 300 feet. Additional separation may be needed to correct the layout deficiency of taxiways that provide direct access from the runway to aircraft parking areas.

Navigational Aids and Airfield Lighting

One set of VASI lights is installed on Runway 31. The previous master plan indicated the VASI should be replaced with PAPIs on both ends of all runways. This is not feasible at Seward because of the terrain on the north end of the airport. Only the south end can achieve the PAPI Obstacle Clearance Surface, which extends 4 miles out from the end of the runway.

The airfield lighting system is old and should be upgraded and expanded to include taxiways and all runways. The Electrical Equipment Building (EEB) should also be replaced or upgraded in association with the runway/taxiway lighting upgrades.

During any paving project, the runway and taxiway markings should be replaced with markings that meet current guidance. Seward Airport runways will continue to be marked as visual runways. SWD currently has a published GPS approach for Category A and B aircraft, but it is rarely used because of the high minimum descent altitude (2,660 feet). This published approach is not a straight-in approach, so the runway is not considered an NPI runway. There are no instrument approaches for Category C and D aircraft.

Lower minimums would make the airport more reliable and would weigh into the consideration for a commuter air taxi service to start scheduled service into Seward. Discussions with the FAA about lowering the minimums, however, did not result in optimism that this would occur. The surrounding terrain is an onerous constraint to improving the approaches in/out of Seward. (See phone log, conversation dated 2/6/2015 with Kyle Christianson of FAA.)

Other Facility Requirements

A new sand storage building is needed. The existing building is in poor condition. However the SSB is not presently part of the project.

The airport access road, Seward Highway, and the Alaska Railroad are all within the RPZ of Runway 13-31, and a small portion of the RPZ of Runway 16-34 overlaps the access road. Although prior to FAA's *Interim Guidance on Land Uses within a Runway Protection Zone* (9/27/2012) these transportation uses were acceptable, they are not encouraged. Additionally, due to their proximity to the end of Runway 13/31, these transportation features create an obstruction to that approach. Correction of these non-standard conditions should be considered to the extent practicable.

Attachments

- Aviation activity data (USDOT T-100, FAA TAF)
- Letter of support from Vigor Alaska
- U.S. Coast Guard correspondence
- Letter of support from Shell Oil
- NetJet correspondence and aircraft performance charts
- Phone log

FAA Terminal Area Forecast: National Forecast 2007 (1) — Enplanements

LOCID: SWD — SEWARD

Year	F	Air Carrier	Air Taxi	Commuter	US Flag	Foreign Flag	Total International Enpl.	Total Enplanements
1976		0	30	0	0	0	0	0
1977		0	0	0	0	0	0	0
1978		0	0	0	0	0	0	0
1979		0	0	1,172	0	0	0	1,172
1980		0	4,474	26	0	0	0	26
1981		11	4,500	111	0	0	0	122
1982		11	25	293	0	0	0	304
1983		0	13	423	0	0	0	423
1984		0	203	489	0	0	0	489
1985		0	5	514	0	0	0	514
1986		0	10	1,117	0	0	0	1,117
1987		0	4	924	0	0	0	924
1988		0	279	1,091	0	0	0	1,091
1989		0	600	1,877	0	0	0	1,877
1990		0	65	2,218	0	0	0	2,218
1991		0	0	598	0	0	0	598
1992		0	0	1,073	0	0	0	1,073
1993		0	0	127	0	0	0	127
1994		0	0	1,073	0	0	0	1,073
1995		0	0	587	0	0	0	587
1996		0	0	846	0	0	0	846
1997		0	0	1,373	0	0	0	1,373
1998		173	0	1,158	0	0	0	1,331
1999		0	0	583	0	0	0	583
2000		0	0	512	0	0	0	512
2001		0	0	338	0	0	0	338
2002		0	0	15	0	0	0	15
2003		0	0	0	0	0	0	0
2004		0	0	20	0	0	0	20
2005		0	0	1	0	0	0	1
2006		0	0	6	0	0	0	6
2007	*	0	0	6	0	0	0	6
2008	*	0	0	6	0	0	0	6
2009	*	0	0	6	0	0	0	6
2010	*	0	0	6	0	0	0	6
2011	*	0	0	6	0	0	0	6
2012	*	0	0	6	0	0	0	6
2013	*	0	0	6	0	0	0	6
2014	*	0	0	6	0	0	0	6

2015	*	0	0	6	0	0	0	6
2016	*	0	0	6	0	0	0	6
2017	*	0	0	6	0	0	0	6
2018	*	0	0	6	0	0	0	6
2019	*	0	0	6	0	0	0	6
2020	*	0	0	6	0	0	0	6
2021	*	0	0	6	0	0	0	6
2022	*	0	0	6	0	0	0	6
2023	*	0	0	6	0	0	0	6
2024	*	0	0	6	0	0	0	6
2025	*	0	0	6	0	0	0	6

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DEPARTURES_PERFORMED	PASSENGERS	FREIGHT	DISTANCE	UNIQUE_CARRIER_NAME	ORIGIN_CITY_NAME	DEST_CITY_NAME	YEAR	MONTH	AIRCRAFT_NAME
1	2	0	274	Grant Aviation	Seward, AK	King Salmon, AK	2012	6	Beech 200 Super Kingair
1	0	0	75	Grant Aviation	Seward, AK	Anchorage, AK	2012	6	Beech 200 Super Kingair
1	0	0	79	Homer Air	Seward, AK	Homer, AK	2012	8	Cessna C206/207/209/210 Stationair
1	1	0	93	Homer Air	Seward, AK	Seldovia, AK	2012	8	Cessna C206/207/209/210 Stationair
1	0	0	79	Smokey Bay Air Inc.	Seward, AK	Homer, AK	2012	10	Cessna C206/207/209/210 Stationair
1	2	0	274	Grant Aviation	King Salmon, AK	Seward, AK	2012	6	Beech 200 Super Kingair
1	1	0	75	Grant Aviation	Anchorage, AK	Seward, AK	2012	6	Beech 200 Super Kingair
1	0	0	79	Homer Air	Homer, AK	Seward, AK	2012	8	Cessna C206/207/209/210 Stationair
1	1	0	93	Homer Air	Seldovia, AK	Seward, AK	2012	8	Cessna C206/207/209/210 Stationair
1	1	0	79	Smokey Bay Air Inc.	Homer, AK	Seward, AK	2012	10	Cessna C206/207/209/210 Stationair
1	1	0	75	Iliamna Air Taxi	Seward, AK	Anchorage, AK	2011	6	Pilatus PC-12
2	8	0	79	Homer Air	Seward, AK	Homer, AK	2011	8	Cessna C206/207/209/210 Stationair
1	0	0	198	Island Air Service	Seward, AK	Kodiak, AK	2011	9	Piper PA-32 (Cherokee 6)
1	8	0	192	Iliamna Air Taxi	Iliamna, AK	Seward, AK	2011	6	Pilatus PC-12
1	5	0	200	Homer Air	Hallo Bay, AK	Seward, AK	2011	8	Cessna C206/207/209/210 Stationair
1	0	0	79	Homer Air	Homer, AK	Seward, AK	2011	8	Cessna C206/207/209/210 Stationair
1	2	0	198	Island Air Service	Kodiak, AK	Seward, AK	2011	9	Piper PA-32 (Cherokee 6)
1	0	0	100	Homer Air	Seward, AK	Port Graham, AK	2010	6	Cessna C206/207/209/210 Stationair
1	0	0	79	Homer Air	Seward, AK	Homer, AK	2010	8	Cessna C206/207/209/210 Stationair
1	6	0	75	Grant Aviation	Anchorage, AK	Seward, AK	2010	7	Beech 200 Super Kingair
1	2	0	79	Homer Air	Homer, AK	Seward, AK	2010	6	Cessna C206/207/209/210 Stationair
1	1	0	79	Homer Air	Homer, AK	Seward, AK	2010	8	Cessna C206/207/209/210 Stationair
2	1	0	79	Homer Air	Seward, AK	Homer, AK	2009	8	Cessna C206/207/209/210 Stationair
2	5	500	79	Homer Air	Homer, AK	Seward, AK	2009	8	Cessna C206/207/209/210 Stationair
1	0	0	75	Alaska Central Express	Seward, AK	Anchorage, AK	2008	9	Beech 1900 A/B/C/D
1	0	0	75	Era Aviation	Seward, AK	Anchorage, AK	2008	4	Beech 1900 A/B/C/D
1	0	0	75	Alaska Central Express	Seward, AK	Anchorage, AK	2008	6	Beech 1900 A/B/C/D
1	0	0	328	Warbelow	Seward, AK	Fairbanks, AK	2008	8	Cessna 172 Skyhawk
2	22	0	328	Frontier Flying Service	Seward, AK	Fairbanks, AK	2008	8	Beech 1900 A/B/C/D
1	0	0	75	Alaska Central Express	Anchorage, AK	Seward, AK	2008	6	Beech 1900 A/B/C/D
1	0	0	75	Alaska Central Express	Anchorage, AK	Seward, AK	2008	9	Beech 1900 A/B/C/D
1	3	0	79	Era Aviation	Homer, AK	Seward, AK	2008	4	Beech 1900 A/B/C/D
1	2	0	153	Warbelow	Talkeetna, AK	Seward, AK	2008	8	Cessna 172 Skyhawk
2	23	0	328	Frontier Flying Service	Fairbanks, AK	Seward, AK	2008	8	Beech 1900 A/B/C/D
1	0	0	198	Island Air Service	Seward, AK	Kodiak, AK	2007	8	Cessna C206/207/209/210 Stationair
1	9	0	328	Wright Air Service	Seward, AK	Fairbanks, AK	2007	7	Cessna 208 Caravan
1	17	0	328	Frontier Flying Service	Seward, AK	Fairbanks, AK	2007	7	Beech 1900 A/B/C/D
1	9	0	328	Wright Air Service	Fairbanks, AK	Seward, AK	2007	7	Cessna 208 Caravan
1	17	0	328	Frontier Flying Service	Fairbanks, AK	Seward, AK	2007	7	Beech 1900 A/B/C/D
1	2	0	198	Island Air Service	Kodiak, AK	Seward, AK	2007	8	Cessna C206/207/209/210 Stationair

FAA Terminal Area Forecast: National Forecast 2007 (1) — Airport Operations

LOCID: SWD — SEWARD

Year	F	Itn Air Carrier	Itn Air Taxi	Itn GA	Itn Mil	Local GA	Local Mil	Total Airport Ops
1976		0	2,500	4,000	5	1,000	5	7,510
1977		0	2,500	4,000	5	1,000	5	7,510
1978		0	2,500	4,000	5	1,000	5	7,510
1979		0	4,500	4,240	5	1,060	5	9,810
1980		0	4,500	4,000	5	2,000	5	10,510
1981		6	4,500	4,000	5	2,000	5	10,516
1982		6	4,500	4,000	5	2,000	5	10,516
1983		0	4,500	4,000	5	2,000	5	10,510
1984		0	4,500	4,000	5	2,000	5	10,510
1985		0	4,500	4,000	10	2,000	0	10,510
1986		0	4,500	4,000	10	2,000	0	10,510
1987		0	4,500	4,000	10	2,000	0	10,510
1988		0	4,782	4,103	10	2,052	0	10,947
1989		0	4,500	4,000	10	2,000	0	10,510
1990		0	4,500	4,000	10	2,000	0	10,510
1991		0	4,500	4,000	10	2,000	0	10,510
1992		0	4,500	4,000	10	2,000	0	10,510
1993		0	0	0	0	0	0	0
1994		0	4,500	4,000	10	2,000	0	10,510
1995		0	4,500	4,000	10	2,000	0	10,510
1996		0	4,500	4,000	10	2,000	0	10,510
1997		0	4,500	4,000	10	2,000	0	10,510
1998		0	4,500	4,000	10	2,000	0	10,510
1999		0	4,500	4,000	10	2,000	0	10,510
2000		0	4,500	4,000	10	2,000	0	10,510
2001		0	4,500	4,000	10	2,000	0	10,510
2002		0	4,500	4,000	10	2,000	0	10,510
2003		0	4,500	4,000	10	2,000	0	10,510
2004		0	4,500	4,000	10	2,000	0	10,510
2005		0	4,500	4,000	10	2,000	0	10,510
2006		0	4,500	4,000	10	2,000	0	10,510
2007	*	0	4,500	4,000	10	2,000	0	10,510
2008	*	0	4,500	4,000	10	2,000	0	10,510
2009	*	0	4,500	4,000	10	2,000	0	10,510
2010	*	0	4,500	4,000	10	2,000	0	10,510
2011	*	0	4,500	4,000	10	2,000	0	10,510
2012	*	0	4,500	4,000	10	2,000	0	10,510
2013	*	0	4,500	4,000	10	2,000	0	10,510
2014	*	0	4,500	4,000	10	2,000	0	10,510

2015	*	0	4,500	4,000	10	2,000	0	10,510
2016	*	0	4,500	4,000	10	2,000	0	10,510
2017	*	0	4,500	4,000	10	2,000	0	10,510
2018	*	0	4,500	4,000	10	2,000	0	10,510
2019	*	0	4,500	4,000	10	2,000	0	10,510
2020	*	0	4,500	4,000	10	2,000	0	10,510
2021	*	0	4,500	4,000	10	2,000	0	10,510
2022	*	0	4,500	4,000	10	2,000	0	10,510
2023	*	0	4,500	4,000	10	2,000	0	10,510
2024	*	0	4,500	4,000	10	2,000	0	10,510
2025	*	0	4,500	4,000	10	2,000	0	10,510

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NetJets
Fleet Aircraft Resource

			RUNWAY SPECS			AIRCRAFT SPECS						OPERATING WEIGHTS					SPEEDS	
AIRCRAFT TYPE	FUEL DELIVERY	PRIST	DRY ABSOLUTE MINIMUM	MINIMUM RUNWAY WIDTH	MINIMUM TAXIWAY WIDTH	DESIGN CATEGORY	MAIN GEAR SPACING	AIRCRAFT WING SPAN	AIRCRAFT TAIL HEIGHT	ACN	MAIN TIRE PRESSURE	NJ BASIC OPERATING WEIGHT	MAX ZERO FUEL WEIGHT	MINIMUM RELEASE FUEL (LBS)	MAX LANDING WEIGHT	MAX TAKEOFF WEIGHT	APPROACH CAT/SPD STRAIGHT-IN (VRef)	APPROACH CAT CIRCLING or Vref + 20
EMB-505	S/O	NO	3500'	50'	30'	BII	9'4"	52'3"	16'9"	5/7.5	174	11922	13999	1750	16865	17968	B	C
CE-560 E	S/O	NO	3500'	50'	35'	BII	13'4"	54' 9"	15' 5"	7	156	10865	12600	1643	15200	16630	B 108	C
CE-560 P	S/O	NO	3500'	50'	35'	BII	13'4"	54' 9"	15' 4"	7	158	10954	12600	1539	15200	16830	B 108	C
CE-560 XL	S/O	NO	3800'	50'	30'	BII	14' 11"	55' 9"	17' 3"	9/10	210	13117	15000	1972	18700	20000	B 117	C
CE-560 XLS	S/O	NO	3800'	50'	30'	BII	14' 11"	55' 9"	17' 3"	9/10	210	13117	15200	1935	18700	20200	B 117	C
CE-680	S/O	NO	4000'	70'	35'	BII	10' 1"	63' 2"	20'	10/11	160	18440	20300	2564	27100	30300	B 110	C
CE-750	S/O	NO	4600'	75'	35'	CII	10' 7"	63' 8"	19' 2"	8/13	180	22139	24400	2968	31800	35700	C 131	D
BE-400	O/W	NO	4200	50'	35'	BII	9' 4"	43' 6"	13' 11"	7	125	11253	13000	1855	15700	16300	B 117	C
HS-125/800 XPC	S/O	NO	4500'	75'	35'	CII	9' 2"	51' 5"	17' 5"	4/9	135	17305	18450	2407	23350	28000	C 127	D
HS-125/900 XP	S/O	NO	4500'	75'	35'	CII	9' 2"	54'4"	17' 5"	4/9	135	16647	18450	2407	23350	28000	C 127	D
G-200	S/O	NO	4600'	75'	35'	CII	12' 6"	58' 1"	21' 5"	4/11	203	20296	24000	2977	28000	35450	C 140	D
DA-2000 (33K)	S/O	NO	4500'	75'	35'	CII	14' 6"	63' 5"	22' 9"	5/12	190	23186	28660	3033	33000	36500	C 126/128	D
DA-2000 (34.5K)	S/O	NO	4500'	75'	35'	CII	14' 6"	63' 5"	22' 9"	5/13	190	23186	28660	3050	34500	36500	C 126/129	D
DA-2EASY	S/O	NO	4500'	75'	35'	CII	14' 7"	63' 5"	23' 2"	5/15	229	24269	29700	3362	39300	42200	C 138	D
GIV-SP/450	S/O	NO	4500'	75'	45'	CII	16'	77' 10"	24' 5"	10/26	189	43656	49000	3-5000	66000	74600	C/D 126-144	C/D 140-150
GV/550	S/O	NO	4500'	75'	45'	CIII	17'	93' 6"	25' 10"	17/33	198	48348	54500	3-5000	75300	90500	C 112-124	C/D 122-134
GL5T	S/O	NO	5000'	100'	50'	CIII	13' 4"	94'	25' 6"	15/31	182	51731	58000	4000	78600	92500	C	C
GLEX	S/O	NO	5000'	100'	50'	CIII	13' 4"	94'	25' 6"	14/33	185	53373	58000	4000	78600	99500	C	C

S - Single Point, O/W - Overwing, S/O - Both
GIV-SP - must weigh 51,000 to circle CAT C
ACN = empty wt/max wt; figure toward high end
NetJets pax wts - 221 Smr, 226 Wntr
* *This document not valid for flight planning* *

10/26/2012

Contact:
Al Ball
Manager, OIA
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NetJets
Fleet Aircraft Resource

AIRCRAFT TYPE	FUEL DELIVERY	PRIST	RUNWAY SPECS: DRY ABSOLUTE MINIMUM	MINIMUM RUNWAY WIDTH	MINIMUM TAXIWAY WIDTH	AIRCRAFT SPECS: DESIGN CATEGORY	MAIN GEAR SPACING	AIRCRAFT WING SPAN	AIRCRAFT TAIL HEIGHT	ACN	MAIN TIRE PRESSURE	OPERATING WEIGHTS: NJ BASIC OPERATING WEIGHT	MAX ZERO FUEL WEIGHT	MINIMUM RELEASE FUEL (LBS)	MAX LANDING WEIGHT	MAX TAKEOFF WEIGHT	SPEEDS: APPROACH CAT/SPD STRAIGHT-IN (VRef)	APPROACH CAT CIRCLING or Vref + 20
EMB-505	S/O	NO	3500'	50'	30'	BII	9'4"	52'3"	16'9"	5/7.5	174	11922	13999	1750	16865	17968	B	C
CE-560 E	S/O	NO	3500'	50'	35'	BII	13'4"	54' 9"	15' 5"	7	156	10865	12600	1643	15200	16630	B 108	C
CE-560 P	S/O	NO	3500'	50'	35'	BII	13'4"	54' 9"	15' 4"	7	158	10954	12600	1539	15200	16830	B 108	C
CE-560 XL	S/O	NO	3800'	50'	30'	BII	14' 11"	55' 9"	17' 3"	9/10	210	13117	15000	1972	18700	20000	B 117	C
CE-560 XLS	S/O	NO	3800'	50'	30'	BII	14' 11"	55' 9"	17' 3"	9/10	210	13117	15200	1935	18700	20200	B 117	C
CE-680	S/O	NO	4000'	70'	35'	BII	10' 1"	63' 2"	20'	10/11	160	18440	20300	2564	27100	30300	B 110	C
CE-750	S/O	NO	4600'	75'	35'	CII	10' 7"	63' 8"	19' 2"	8/13	180	22139	24400	2968	31800	35700	C 131	D
BE-400	O/W	NO	4200	50'	35'	BII	9' 4"	43' 6"	13' 11"	7	125	11253	13000	1855	15700	16300	B 117	C
HS-125/800 XPC	S/O	NO	4500'	75'	35'	CII	9' 2"	51' 5"	17' 5"	4/9	135	17305	18450	2407	23350	28000	C 127	D
HS-125/900 XP	S/O	NO	4500'	75'	35'	CII	9' 2"	54'4"	17' 5"	4/9	135	16647	18450	2407	23350	28000	C 127	D
G-200	S/O	NO	4600'	75'	35'	CII	12' 6"	58' 1"	21' 5"	4/11	203	20296	24000	2977	28000	35450	C 140	D
DA-2000 (33K)	S/O	NO	4500'	75'	35'	CII	14' 6"	63' 5"	22' 9"	5/12	190	23186	28660	3033	33000	36500	C 126/128	D
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S - Single Point, O/W - Overwing, S/O - Both
GIV-SP - must weigh 51,000 to circle CAT C
ACN = empty wt/max wt; figure toward high end
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** This document not valid for flight planning **

10/26/2012

Date/Time NEW ENTRY	Contact/Phone	Disc.	Comments

			of snowfall.
			Kyle asked if they are trying to reduce the minimums of the north approach or add an approach from the south. Any procedures for Seward are controlled by terrain. Reducing the minimums may be done with special (non-public) procedures. With special procedures, every item must be addressed. The FAA has to determine that the special procedure has an equivalent level of safety. The proponent must show why it is just as safe. This might restrict the approach to only authorized users with training and proof of aircraft performance. This is no sure thing. The review board is in Washington DC, and meets every Thursday to evaluate specials. They are not likely to take risks, and with the mountainous terrain, they are likely to say no.
			Developing a special approach is expensive. If the FAA works on it, they need a reimbursable agreement. Kyle is the only FAA person that works on the approaches in Alaska, his backup is in Seattle. Another option is to find a private consultant to design the approach. They would have to follow the FAA-approved design procedure. Jeppeson is one contractor that designs approaches, Kyle knows of only one other one. It takes a long time to learn the system. They may be able to get a little bit lower (descent altitude), but they need to have good data points. Even if they could get down to 1500 feet, that is a good day in Seward.
			Kyle described the process for getting FAA to design a procedure. The FAA reimbursable agreement will be a minimum of $10,000 for development of an RNAV procedure; it costs a lot to flight check. To use a special procedure, the operators will have to request authorization and prove performance. Dennis felt Lifeflight might do this.
			Kyle said we need to be smart about how the approach is designed (to make it most useful to operators). He will be happy to discuss it further with Dennis, and gave him his card. Dennis said Tom George is interested in the Seward Airport, and has some ideas on the approaches. He will be meeting with Tom.
			Dennis said he is trying to get electricity hooked up and the city wants $50,000 for that. They told his neighbor (Lucky) it was $100,000 to get hooked up.
			Kyle and Dennis discussed the approaches into Valdez and Juneau and compared them to Seward.
			
			Barbara added the following notes from the teleconference:
			• Kyle discussed the idea of increasing the gradient for the existing approach. However a high percentage of operators need to sign an agreement that they can use a steeper gradient. Even with a steeper gradient, good minimums are not possible due to surrounding terrain. Lower minimums are not possible for a public approach using existing criteria.
			
			• A special approach would be expensive and would require the following:
			
			  • Hiring a private contractor to determine feasibility. One is not available in Alaska.
			  • A Reimbursable Agreement with FAA to cover their internal costs as well as a flight check. (About $10K)
			  • Discussion of what items need to be waived for the procedure to work.

Date/Time NEW ENTRY	Contact/Phone	Disc.	Comments
2/6/15 10:00 am By Ken Risse	Kyle Christianson, FAA 271-5187	CE	A meeting with Kyle Christianson and Dennis Perry (Seward working group) was held at the 3rd floor, Federal Building, 222 W 7th Ave, Anchorage, AK. Royce and I attended by teleconference. Attendees: Dennis Perry – Seward Working Group Barbara Beaton – DOT Project Manager Joy Vaughn – DOT Consultant Coordinator Royce Conlon – PDC Project Manager Ken Risse – PDC Civil Designer Kyle Christianson – FAA Flight Procedures Office Dennis spoke about his experience flying in and out of Seward. He operated Bear Lake Air Service for 15 years. He now runs a B&B and takes hunters out to Montague Island. Getting off of the island in the winter depends on weather, tides, and daylight. He estimated the chance of getting off the island any given day in November is about 50%, in December it is about 20%. Dennis noted that Seward is the second most popular tourist destination in Alaska, next to Denali. Seward used to have daily service from FS Air. It was subsidized by the DOT. Floyd Salts would always be able to fly out of Seward, but could not always get in. When he died, his wife did not have a grasp of what worked in Seward and moved the operation to Anchorage. Often they would launch for Seward and then cancel due to weather. Eventually DOT withdrew the subsidy. Dennis described one of his most memorable flights returning to Seward with some hunters. It was a bad situation where the weather closed in quickly and at altitude he was icing up, so he had to drop down and fly low. He ended up relying on his knowledge of where the Alaska Railroad 200' tall coal gantry was relative to the airport and made a landing shortly after passing that landmark. This was before the GPS instruments were as developed as they are now. Dennis now has synthetic vision, but said he is too old to do the (FAR Part) 135 work. Aeromed flys the RNAV approach. Large planes occasionally fly into Seward. Dennis has seen a 737 make an emergency landing. The Chinooks and C-130's use it occasionally. The airport also needs a place for the float planes. When the city built the dock, they took out a float plane ramp. Some planes on floats land near the beach when they cannot get to Bear Lake, and bob up and down with the tides. Overall Dennis felt extending the shorter runway was the best solution for the airport. Dennis said what they are looking for is an approach with a 500 foot decision height. (The current RNAV MDA is 2660'. Kyle said the published approach is based on a 200'/nautical mile climb rate per TERPs. They can publish a higher climb rate, but only if operators can assure the higher rate. The missed approach splays out so quickly, that it runs into terrain. More terrain comes into play with a lower descent point. A private approach could be developed as they have in Southeast Alaska, but it would not be published. Dennis noted that a lower minimum could help during times when the community is cut off due to avalanches. In the late 1990's Seward was cut off for 2 ½ weeks. Trucks with supplies had to be ferried from Whittier. The DC-6 and Otters did not fly until they had VFR weather. Bear Lake has had 572 inches

Date/Time NEW ENTRY	Contact/Phone	Disc.	Comments
			• Review/approval by a group in the lower 48. The group is made of primarily of airline pilots. Kyle had a high level of confidence a private special approach could be approved. • For no cost, a public approach can be requested from the south. • A LP/LPV approach may be possible but only limited operators can use it. • Per Kyle, tweaking the runway alignments will not likely help with the existing approach. The airport is not aligned well with the valley. To align the airport will mean moving it to the middle of the river. • A public approach with a 2,400 ft runway may be supported by flight standards even though they like to have 3,200 ft. Joy added the note below: • Kyle said a public approach, if requested, would take the FAA 18 months to 2 years to establish assuming they don't have problems with "bad data points," which I took to mean data problems with the locations of obstacles.
11/5/2014 10:00 am By Ken Risse	Kyle Christianson, FAA 271-5187	CE	I called Kyle to discuss the approaches at Seward, and the possibility of reducing the minimums. He said the big problem at Seward is that it is surrounded on all fours sides by onerous terrain. The missed approach trapezoid expands so rapidly that no matter how the runway is oriented, it runs into the mountains. The only way to substantially reduce the minimums is with an RNP approach, which requires high cost equipment both on the ground and in the aircraft flying into the airport. Alaska Airlines uses these approached flying into Anchorage and Deadhorse. He did not think it would ever be feasible at Seward. The published approach was developed on best available information. If an aeronautical survey is done for Seward, the minimum altitude may go down a few feet. In summary, no significant improvements to the instrument approaches are expected.
8/27/2014 10:12 AM by Patrick Cotter	Dirk Bowen LifeFlight 907.903.5987	P	Dirk called me back to discuss LifeFlight's use of SWD. He said they use the King Air 200 for medevacs, and need at least 3,000' of runway. During the times the runway was flooded, they were unable to land – the crosswind is too short.
8/13/2014 10:03 AM by Ken Risse	Kodiak Coast Guard Air Station 907-487-5888 Menu Item 4	CE	I called the Kodiak Coast Guard to discuss their needs at Seward. Primarily they fly the H-60 helicopters into Seward and their primary need is fuel They have not flown any C-130s into Seward recently because of the weight restrictions. They will have someone from the C-130 contact me either by phone or email to discuss their facility needs.

Date/Time NEW ENTRY	Contact/Phone	Disc.	Comments
8/12/2014 4:32 PM by Royce Conlon	RAVN Air (formally ERA/Frontier) Jim Hajdukovich	P	I called Ravn Air to discuss current and potential operations into the Seward Airport. Bob Hajdukovich (CEO) was also in the background and project Jim with some answering to my questions. Is Ravn currently providing any service to Seward? Jim said only by Charter and without looking it up he would estimate only 2-3 times in the last 8 years. Those were for charters of groups that where separating from the cruise ship tours for whatever reason. <In review of the T-100 data after talking with Jim it shows Frontier Flying had flights in the past 5 years using the Beech 1900>. Are they considering providing scheduled service into Seward? Not within the foreseeable future (which he clarified was probably 5 years). What would it take for them to consider services? Demand and a better approach; he looked it up and said with 4300' ceilings it would be to unreliable to commit to scheduled service. If they did add a scheduled service what aircraft would they use? Not one of their Part 121 aircraft, probably a smaller VFR aircraft like a 206 or a Caravan. I explained the runway situation in Seward and the importance of determining the future design aircraft for purpose of determining runway length and design group. He said he thought the State should maintain at a minimum at least a 4000' runway; if nothing else for medevac operations (he suggested we make contact with the medevac providers if we hadn't already done so).
8/8/2014 2:32 PM by Patrick Cotter	Mike Fisher Northern Economics 907.274.5600	P	Mike called me back to talk about NEI's feasibility study for relocating the CDQ fleet to Seward. Coastal Villages was very interested in keeping their fleet in Alaska during the off-season – ½ of the fleet in Seward and ½ in Platinum. In the last couple years, Coastal Villages' growth has slowed down and now they aren't as interested in investing in infrastructure in those ports. NEI's feasibility study also determined that expanding the SMIC to accommodate the CDQ fleet didn't "pencil out" for the city. Essentially the city would have to either find other users during the times the CDQ fleet was out to sea, or charge the CDQ a ridiculously high rate. The feasibility study didn't include an assessment of who those other users might be.
8/7/2014 12:33 PM by Patrick Cotter	Tim Veneer Guardian 907.982.2299	P	I called Tim to discuss Guardian's use of the Seward Airport. He said that they use a King Air to service SWD, approximately 20-50 times/year. They do not have a helicopter. He mentioned that there are times when the braking action is nil at SWD and they can't land. I asked about Lear Jet use and he said it would need a wider and longer runway, as well as a better approach.
8/1/2014 11:43 AM by Patrick Cotter	Tim Nixon LifeMed 907.249.8402	P	Tim returned my call to discuss LifeMed's use of Seward Airport, including aircraft types and needs. He said that they have approximately 100 medevac flights out of Seward every year. Roughly 70 are by helicopter and 30 by fixed-wing. The fixed-wing is a King Air dispatched out of Fairbanks. They also have a Lear Jet, but it requires 5,000' of runway. He mentioned that Seward is fogged in pretty regularly and often prevents the helicopter from getting in. He gave me the chief pilot's number and told me that he could answer specific questions about the aircraft and runway needs. Steve Lewis – 907.317.7614
7/31/2014 9:21 AM by Patrick Cotter	Kristen Providence Seward Medical & Care Ctr 224.5205	P	Called Seward Providence to ask how they use the airport for Medevacs. Kristen told me they call one of their flight services (either LifeMed or Guardian) and let them decide what type of aircraft to use. Generally, LifeMed will choose the helicopter first, while Guardian tends to use fixed-wing. Helicopters can land at the medical center, but will occasionally use the airport if conditions warrant. Local ambulance will transport the patient to the airport.

Date/Time NEW ENTRY	Contact/Phone	Disc.	Comments
7/24/2014 11:48 AM by Ken Risse	Mike Insalaco Seward Aircraft Storage 830-7393	CE	Mike is working with Lucky Wilson, who has a lease lot and the large hangar for sale at Seward. Lucky is out of state right now. I called Mike on 7-14-14. They do not have any aircraft at Seward, but have a large hangar available. He felt if the runway length were reduced, it would affect the viability of their business. The hangar was built for large aircraft like the Coast Guard Apache Helicopters, Beech 1900 or other large aircraft that ERA or other commuter air carriers may use. He felt the runway length should be 5000' for landing larger commuter aircraft. He has seen a Beech Premier jet aircraft parking at Seward 1-2 times /year. Airport needs he listed include: A better instrument approach – lengthening the short runway would give a better alignment for up the valley. When ERA flew, the GPS approach was on the wrong runway. Although there was just as much traffic at Seward as Kenai, Mark Air Express could not open a station at Seward because of the weather and poor approaches. Seward also needs a place for seaplanes to be hauled out. Tiedowns on the apron need to be fixed.
7/9/14 8:30 am	Jerry Olson (907)362-2510		Give him a call in the afternoon. He might be around. Not a lot of time to talk/busy season.
7/9/14 8:40 am	Scenic Mountain Air (907)288-3646		Not interested in meeting. He's done these things before and believes it's a waste of time. Doesn't care what they do with the runway. His big issue is the cell phone towers nearby. They are a danger and someone is going to kill themselves on them one day.
7/9/14 8:45 am	Denny Hamilton (Seward Air) (909)491-1357		He's 5 minutes away. Give him a call when we're available and he'll come by the airport.
7/9/14 8:50 am	Dennis Perry (907)362-1866		Has a dentist appointment in the morning. Will stop by afterward, probably around 11:30. Told him we would leave him a message on his cell when we are in town. His is the 3rd hangar from the end.
7/9/14 9:00 am 7/9/14 3:15 pm	Brandon Anderson (Civil Air Patrol) (907)224-3000		Left message – our contact info, when we will be at the airport, why we would like to meet He should be on-site after 11:30 and there for several hours. Stop by at your convenience.
7/9/14 9:00 am	Gregory Thrall (907)288-3643		Left message – our contact info, when we will be at the airport, why we would like to meet [tried again at 3:15pm, voicemail]
7/9/14 9:00 am	Lucky Wilson (907)224-5664		Left message – our contact info, when we will be at the airport, why we would like to meet [tried again at 3:15, voicemail]

MEMORANDUM

Date: July 21, 2015

To: Barbara Beaton, DOT&PF Project Manager

From: Robin Reich (Solstice Alaska Consulting) with input and review from Royce Conlon, PDC Project Manager

Subject: Summary of 07/21/2015 Stakeholder Working Group Meeting #2 – Seward Airport Improvements Project (#54857)

Introduction: Meeting Overview

This document provides a summary of the second Stakeholder Working Group (SWG) meeting held on July 21, 2015, for the Seward Airport Improvements Project. The meeting was held as a teleconference based in Anchorage. The meeting began at 11:00 am and ended at approximately 12:00 pm. Table 1 lists the meeting attendees.

Table 1. Meeting Attendees

SWG Membership	**Name**
Alaska Railroad Corporation (ARRC)	Jim Kubitz, Brian Lindamood, and Christina Hendrickson
City of Seward: Seward City Council	Christy Terry (joined the meeting mid-way)
City of Seward: City Manager/Community Development	Ron Long
Civil Air Patrol	Brandon Anderson
Federal Aviation Administration (FAA)	Mike Edelmann
Kenai Peninsula Borough (KPB) Seward/Bear Creek Flood Service Area, Water Resource Manager	Dan Mahalak
Lease Holder, General Aviation (GA) Pilot, Community Member	Dennis Perry
Alaska Department of Transportation and Public Facilities (DOT&PF) Maintenance	Sean Montgomery
DOT&PF Project Management, Central Region Design and Engineering	Barbara Beaton, P.E., Project Manager
DOT&PF Central Region Design and Engineering	Joy Vaughn, P.E., Consultant Coordination
Consultant: PDC Inc. Engineers	Royce Conlon, P.E., Consultant Team Project Manager
Consultant: PDC Inc. Engineers	Ken Risse, Civil Engineer
Consultant: Solstice Alaska Consulting, Inc.	Robin Reich, Public Involvement, with Olivia Cohn, Public Involvement Project Support

Meeting materials included the meeting agenda; draft "Forecast of Aviation Activity & Facility Requirements" technical (tech) memorandum (memo); and November 19, 2014 Stakeholder Working Group (SWG) Meeting #1 notes. These items were distributed via email prior to the July Meeting #2. Table 2 presents the meeting agenda to document the meeting objectives, goals, and format.

Table 2. Meeting #2 Agenda and Overview

Meeting Objectives (Our Work Today) • Discuss the November 24, 2014 SWG Meeting #1 summary and action taken (provided in advance). • Answer questions regarding Final "Aviation Activity & Facility Requirements" technical memorandum (provided in advance). • Discuss the project's status and next steps.
Meeting Goals (Meeting's End Result) • SWG understanding of the Final "Aviation Activity & Facility Requirements" technical memorandum.
Meeting Agenda (Topic and Timeline) • **Introductions and purpose of the meeting** (Robin Reich, Solstice Alaska Consulting) (11:00-11:15 am) • **Welcome** (Barb Beaton, P.E., DOT&PF) (11:15-11:20 am) • **Questions regarding SWG Meeting #1 minutes** (Robin Reich) (11:20-11:35 am) • **Final "Aviation Activity & Facility Requirements" tech memo discussion** (Royce Conlon P.E., PDC Inc. Engineers) (11:35 am-12:30 pm) • **Status on other project activities and next steps** (Royce Conlon) (12:30-12:45 pm) • **Adjourn (12:45 pm)** Thank you for your time and participation!

Introductions and Purpose

The meeting began with introductions, and Robin Reich, Solstice Alaska Consulting, reiterated the purpose of the meeting to review the final "Forecast of Aviation Activity & Facility Requirements" tech memo, discuss questions pertaining to that memo, review notes from the November 19, 2014 SWG Meeting #1 including documented action items, discuss progress since the November meeting, and review next steps.

Welcome

Barbara Beaton, DOT&PF, provided an opening statement. She clarified that the design team responded to issues brought up at the last meeting and updated the forecast memo accordingly. Ms. Beaton confirmed that the meeting would focus on discussing updates and answering questions, and she introduced Royce Conlon, PDC Engineers, to lead the discussion.

Discussion Regarding SWG Meeting #1 Summary

Royce Conlon, PDC, noted that at the last meeting the group discussed the draft tech memo. She asked if SWG members had questions or comments on this meeting or the summary of the meeting as documented in the meeting notes (provided).

1. **Vigor Alaska and Shell Alaska feedback.** Robin Reich, Solstice Alaska Consulting, noted that in advance of the meeting, Christy Terry of the City of Seward asked if the team had received letters of support from Vigor and Shell.
   - Ms. Conlon confirmed that this feedback was received. The receipt of letters from Shell and Vigor was documented within the Meeting #1 notes. This information was also incorporated as part of the tech memo.
     - Ms. Conlon explained that Shell and Vigor both provided "letters of support" for the Seward Airport and for the Seward Airport Improvements Project. Both letters noted that that each company's future plans anticipate increased future use of the airport in support of anticipated, expanded operations. This relationship was noted in general terms (not quantified).
     - Ms. Conlon noted that the Vigor and Shell letters provide input that the airport use is growing, and the revised tech memo notes this anticipated future activity. She also noted that the Federal Aviation Administration (FAA) cannot fund that future right now. She clarified that the FAA may support a 4,000-ft runway in the future, but for this project, in the near term and given the current use, FAA would likely fund only a 3,300-ft runway.

2. **Additional data.** The project team was asked if the tech memo includes the additional operations data from the mid to late 1990s (referring to the SWG request at the last meeting to extend the planning period). The team was also asked about the tech memo's discussion of wind coverage, approaches, and occasional excessive crosswinds (points of discussion from the last meeting).
   - **FAA input.** It was noted that Dennis Perry, with the DOT&PF and PDC, met with the FAA's Kyle Christiansen regarding ways to improve runway reliability. The core of this discussion was the idea that it might entice a commuter company to offer services out of Seward Airport. The information from this meeting is appended to the tech memo. Because of the terrain, FAA

Flight Standards has indicated that an improved public approach would be difficult, if not impossible, to design in Seward. Outside this project, an improved special approach designed for an individual carrier or for specially qualified aircrew and equipment, however, may be possible.

3. **Coast Guard interest.** It was asked whether the Coast Guard is interested in the Seward Airport.
   - The team responded that the Coast Guard was contacted, and the Coast Guard does have an interest in the Seward Airport in terms of both immediate and future needs. The team also noted, however, that FAA is not able to fund another federal agency's activities or needs. Designing the airport to a length and width to accommodate future use by the Coast Guard with C130 aircraft is beyond FAA's funding jurisdiction.
     - Ron Long, City of Seward, asked for clarification regarding the width of the runway. The team noted that the 4,000-ft option would include a 75-ft width. This option would not preclude Coast Guard aircraft from operating, but generally it is better to have a longer/wider runway.

4. **Federal agency collaboration.** Mr. Long asked whether there could be a collaborative effort whereby each agency brings something toward the whole project, given that they cannot fund each other's needs.
   - Mike Edelmann, FAA, responded that there are complexities when multiple federal agencies are involved in a project, and he noted that it would not be a simple process. Extensive up-front coordination would be required, and it would not be as easy as the Coast Guard providing some extra money for a wider runway.

5. **Additional questions/comments.** The floor was opened for additional questions and comments.
   - There were no questions, and SWG members thanked the team for preparing the materials and for incorporating their comments from the first SWG meeting into the process.

<u>Discussion Regarding the Final "Forecast of Aviation Activity & Facility Requirements" Tech Memo</u>

At this point, the meeting focus turned to reviewing the "Forecast of Aviation Activity & Facility Requirements" tech memo, which the team provided to SWG members in advance of the meeting. The team noted that the general finding of the tech memo is the need to respond to near-term needs and conditions while also keeping a prudent planning eye on the future. Ms. Conlon presented the key finding of the tech memo related to facility requirements:

- A runway length of 3,300 feet is the standard for Community Class airports, and Seward Airport is a Community Class airport. A longer, 4,000-foot runway is not precluded in the future to meet future needs related to commuter aircraft such as the Beech 1900 and/or the Dash 8. This project, however, will focus on a 3,300-ft runway to meet existing needs.

1. **Elements of the planned improvement, a 3,300-ft runway.** Ms. Conlon explained the following components of a 3,300-ft runway:
   - The runway would be a reconstruction of Runway 16/34 (the existing crosswind runway).

  - If improvements were made to the main runway (13/31), improvements would require other/additional actions to be taken to ensure functionality.
- Runway 13/31, the existing, main runway, would be closed.
- Runway 16/34 would be slightly offset to allow large aircraft to use the apron. Runway 16/34 orientation was chosen to maximize wind coverage.
- The elevation of Runway 16/34 would be raised above the 100-year flood level.
- Some Taxiways would need to be reconstructed to match runway modifications, others will be eliminated, and to meet current standards.

2. **Discussion of a 4,000-ft option.** The SWG asked for clarification regarding if the project could continue to consider the 4,000-ft runway as an option. Members asked: How much would the project need to change to accommodate the longer runway option? Would the project change by a small amount, or would it need to follow a completely different planning path?
   - The project team confirmed that to change from a 3,300-ft runway to a 4,000-ft runway would involve adding 700 ft to the end of the runway. This additional length would fit at the end of the 3,300 foot runway; therefore, there would be no need for an entire relocation of the project to accommodate the additional 700 ft.
     - However, the team explained that work on alternatives analysis (the alternatives to carry forward for this project) includes consideration of funding. An alternative funding source would be needed to pay for the additional runway length as it does not qualify for FAA funding. Extra coordination would be required that would necessitate at a minimum a signed Memorandum of Agreement.
   - Barbara Beaton, DOT&PF, also noted that any added length would change the environmental impacts, and that these impacts would need to be assessed for the longer stretch of runway.

3. **Taxiway Discussion.** Jim Kubitz, ARRC, noted that an ARRC access road is near Runway 16/34 (identified by SWG members as "the existing, short runway" or the "crosswind runway"). He asked if this runway were moved laterally, if there would be room for a taxiway, as well.
   - The project team confirmed that there would be an existing taxiway between the apron and the runway.
   - The project team noted that the taxiway would be expanded for design group B-II aircraft.
   - Mr. Kubitz asked whether the taxiway would still be adequate if it were expanded later.
     - The team noted that the facility would accommodate aircraft with a Design Group II wingspan (up to 79-ft wingspan); it would not, however, be designed for Coast Guard aircraft.
     - Mr. Kubitz noted that he is trying to ensure that there is enough taxiway in the future if an expansion were to happen. He referenced the facility requirements documented on page 15 of the tech memo. This information is excerpted below.

Excerpt from the "Forecast of Aviation Activity & Facility Requirements" tech. memo, p. 15.

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Facility requirements are listed in the table below for three potential groups and compared with the larger of the two existing runways. Data collected and analyzed in this document supports the "Current Demand & Medevac" scenario. Currently, there is an insufficient number of operations by large aircraft to support the "Growth Scenario & Emergency Preparedness" column in the chart below. That scenario is included for future planning purposes.

Table 13 – Runway Dimensional Standards for Various Scenarios

Feature	Current Based Aircraft Group	Current Demand & Medevac (King Air B200) Recommended for Near-Term Development	Growth Scenario & Emergency Preparedness (Beech 1900) Consider for Long-Term Development	Existing RW 13-31
Approach Category	A	B	B	B
ADG	I	II	II	II
Runway Length	3,300' (Note 1)	3,300' (Note 1)	4,000'/4,700' (Note 2)	4,533'
Runway Width	60'	75'	75' (Note 3)	100'
Visibility Minimums	1 mile	1 mile	1 mile	1 mile
Crosswind Component	10.5 knots	13 knots	16 knots	13 knots
Runway Safety Area	120' x 3,780'	150' x 3,900'	150' x 5,300'	150' x 4,749'
Object Free Area	400' x 3,780'	500' x 3,900'	500' x 5,300'	500' x 4,749'
RPZ	1,000' x 500' x 700'	1,000' x 500' x 700'	1,700' x 500' x 1,010'	1,000' x 500' x 700'
Part 77 Primary Surface	500' x 3,700'	500' x 3,700'	500' x 5,100'	500' x 4,649'
Part 77 Approach Slope	20:1 (Visual)	20:1 (Visual) (Note 4)	20:1 (Visual) (Note 4)	20:1 (Visual)

1. Minimum runway length for community airports per Alaska Aviation Preconstruction Manual exceeds FAA AC 150/5325-4B (2,750 feet for 95% of fleet or 3,250 feet for 100% of fleet) and King Air B200 published takeoff and landing distances.

2. The 4,700-foot runway length is based on FAA AC 150/5325-4B for aircraft over 12,500 lbs. but less than 60,000 lbs. (75% of fleet at 60% useful load). The FAA is circulating a Draft AC 150/5325-4C, which recommends using manufacturer's airport planning manuals for all large airplanes (over 12,500 lbs.). The Beech 1900D specification and performance sheet lists a takeoff length of 3,737 feet. Discussions with the primary air carrier in Alaska using this aircraft indicated a need for a 4,000-foot runway to accommodate it. A 4,000-foot runway option is being considered, which would accommodate the Beech 1900 and other large aircraft such as the Dash 8 and Sherpa.

3. Runway width may be increased to 100 feet to provide for larger emergency response aircraft such as the C-130.

4. By definition, a non-precision instrument (NPI) approach runway means a straight-in approach is planned or has been approved (Part 77.2). SWD's approach is currently a circling approach (RNAV [GPS]-A). Review of the FAA flight standards and local topography indicates a straight-in approach is not viable at Seward due to the mountainous terrain on all sides.

4. **Land ownership.** Clarification was sought to help understand land ownership boundaries.
   - The project team answered that land ownership is being fine-tuned. The team noted ongoing work on the design to lessen impacts to ARRC property.

- **Discussion of potential conflicts between airspace and barge operations.** The project team asked for more information related to future planned use of the dredged barge basin between the jetty and track.
  - ARRC noted that this area is set up for barges and barge parking.
  - A member of the SWG commented that the barges could be moved closer to the freight dock so that cranes would not be located on the side of the runway.
- The area serves as a barge parking lot by the jetty; however, it is believed that there will not be room to do crane work in this location.

5. **Railroad access road.** Mr. Kubitz commented that the ARRC may have a small access road on the jetty to access barges. ARRC may need to move this to the east at some point. If ARRC is going to do this major project, costs will need to be justified and part of this cost justification is the need to access stored barges.
   - It was asked whether this access road would be public or private. Mr. Kubitz responded that it would be private (for freight access) and would be gated for security reasons.

6. **Road in the Runway Protection Zone (RPZ).**
   - A SWG member asked if this regulation made a distinction between private or public roads.
   - Mike Edlemann with the FAA noted that it cannot be a public road; a service road, however, under certain conditions such as its having controlled access by the landlord (in this case the ARRC), could occur in the RPZ. Such a use would need to follow an approval process, but it could be approved.

7. **Concluding thoughts about the planned improvement: one, 3,300-ft runway.**
   - Ron Long, City of Seward, thanked the group for this discussion and noted that the City of Seward would like to get a longer runway in the near future.
   - Dennis Perry asked whether the project is only considering a short runway.
   - Royce Conlon, PDC, responded that DOT&PF is planning for a long runway in the future, but working toward a short runway in the near term. The project team will ensure that plans do not preclude a 4,000-ft runway.

8. **Short runway approach.** Dennis Perry shared that he has been doing considerable research as to the efficacy of a new approach into Seward. He has been discussing this with Grant Aviation, who believes that there is considerable merit to this idea. They would use an approach to the west side of the bay, which would support missed approaches and avoid mountain issues within proximity to the long runway.
   - Mr. Perry is planning to request an audience with Kyle Christianson, FAA, at the end of the summer. He thinks that this approach is good and compares well with other Alaskan cities with similar situations to Seward, such as Valdez, Kodiak, and Scammon Bay. In Valdez, Dennis noted that the missed approach is a right bay. When he has completed the missed approach in Seward in his personal airplane at maximum speed, he had 2/3 of the bay left, so he knows that the approach works well.
   - Mr. Perry would like a new approach to be on the table since it would require that if we made the decision, the approach could be done and any runway could be chosen, but it would mean staying to the west bay, especially Lowell Point.
     - Royce Conlon, PDC, commented that a brief discussion regarding the private versus public approach is provided in the tech memo. She noted that the FAA has concerns with the idea of having a public approach.

9. **Impacts to the river.** SWG members asked if the team knows the upstream and downstream impacts at this time.

- The project team noted that impacts are not yet known.
- A member of the SWG commented that in the past there has been discussion regarding moving the river back to its original location, but this is not possible now.
- It was noted that the airport essentially serves as a dike.
- Christina Hendrickson noted that consulting after the meeting with Dan Mahalak (KPB Seward/Bear Creek Flood Service Area, Water Resource Manager) about the river would be the best point of contact.
- Dennis Perry commented that, eventually, the river could become a good float plane base.
- A comment was made about working to change the recent floodplain mapping (which now locates the airport in the floodplain). Discussion ensued with some noting the difficulty and/or futility of this course of action and others noting that there are ways to do this, and it should not be dismissed; (the structure is in place and may be somewhat difficult to navigate but is within our capacity).

Status Updates and Next Steps

To conclude the meeting, the following next steps were outlined.

1. **Hydrology Report:** A hydrology report will be the next document that is prepared, and the team will provide a copy to the appropriate parties, including Dan Mahalak (KPB Seward/Bear Creek Flood Service Area, Water Resource Manager).

   - *Action Item: provide copy of the hydrology report to Dan Mahalak and other interested parties.*

2. **Alternatives Analysis:** The analysis of alternatives is in progress. Key impacts under study at this time are right-of-way impacts and acquisitions, floodplain impacts, and cost. There could be a substantial cost element and a time element related to findings. Coordination with the Federal Emergency Management Agency (FEMA) will also occur.
   - Ron Long, City of Seward, noted that if this work references a map of the area, the subdivisions present in the river area could be misleading. These properties are almost all abandoned or have been deeded back to the City by the landowners because the land is not developable. He noted that there could be a decent amount of land if the project requires offsets or other criteria. There are houses that have to be bought back or torn down, and property values are reduced because they are on a floodplain.
     - The team noted that it was using the property assessment records to help determine the cost of property impacts.
     - Mr. Long responded that the Borough has an office that does the assessment, whose numbers the City accepts at face value. The City and the Borough have had properties deeded back to them.
     - Dan Mahalak noted that, for a point of record for parcels, a general rule of thumb is to add 20% value for in-town parcels and 10% value for parcels within the Borough for market appraisal. Increase the cost by 20% and 10% over the assessed cost.

- ☐ *Action Item (consultant team): continue Alternatives Analysis; prepare to provide an update on progress.*

3. Closing Comments:

- **Next meeting.** The team noted that it will contact SWG members to plan for the next meeting. Currently, September is being considered for the next meeting.

  - ☐ *Action Item (consultant team): prepare for and establish a time for the next meeting.*

- **Progress moving forward.** Royce Conlon noted that the team is continuing to make progress. It seems that there is a consensus on the facility requirements to look at a 3,300-ft runway in the near term and a 4,000-ft runway in the long term.

- **Additional input.** It was noted that if there are others who should be involved in this project, please let the team know.

  - ☐ *Action Item (SWG members): inform consultant team if there are additional contacts who should be included in the next SWG meeting.*

Adjourn

The meeting concluded at approximately 12:00 pm. Thank you for your participation!

Olivia Cohn

From: Olivia Cohn <olivia@solsticeak.com>
Sent: Monday, March 7, 2016 12:59 PM
To: 'bca.alaska@gmail.com'; 'mike.edelmann@faa.gov'; 'terryc@akrr.com'; 'rlong@cityofseward.net'; 'kubitzj@akrr.com'; 'dmahalak@borough.kenai.ak.us'; 'sean.montgomery@alaska.gov'; 'BearLakePilot@gmail.com'; 'dennis.perry@alaska.gov'
Cc: 'Robin@solsticeak.com'; 'Carla@solsticeak.com'; 'olivia@solsticeak.com'
Subject: Meeting Confirmation: Seward Airport Improvements 4/20 SWG Meeting

Dear Stakeholder Working Group:

Thank you for indicating your availability for an April meeting of the Seward Airport Improvements Project Stakeholder Working Group (SWG). Per your responses, the SWG meeting will take place on **Wednesday, April 20, 2016, from 1:30 pm to 3:30 pm** in Seward. Also, a public meeting will take place on this date, in the late afternoon to early evening.

Please mark your calendar for these meetings. Additional information, including the meeting location in Seward, is forthcoming.

Thank you.

Olivia Cohn
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SWG Meeting #3 Agenda and Overview

Meeting Objectives (Our Work Today)

- Review where we are in the process.
- Present the results of the Hydrology Report.
- Present alternatives developed to solve identified issues and needs.
- Present the advantages and disadvantages associated with each alternative.
- Gather input from SWG members on alternatives and their advantages and disadvantages.
- Gather input from SWG members on how to evaluate alternatives.

Meeting Goals (Meeting's End Result)

- Shared understanding of the alternatives and their advantages and disadvantages.
- Shared understanding of the evaluation process and criteria that are important for ranking alternatives.
- Shared understanding of the project process, including next steps.

Meeting Agenda (Topic and Timeline)

- **Introductions and Purpose of the Meeting**
  (Robin Reich, Solstice Alaska Consulting) (1:30-1:40 am)
- **Welcome** (Barbara Beaton, P.E., DOT&PF) (1:40-1:45 pm)
- **Recap of the Project and its Challenges**
  - Hydrology: Discussion of the Hydrology Report
  - Aviation Demand: Recap of Aviation Demand Report
  - Funding

  (Royce Conlon P.E., PDC Inc. Engineers) (1:45-2:00 pm)
- **Evaluation Process**
  - Presentation and discussion of draft criteria for evaluating alternatives.

  (Royce Conlon) (2:00-2:15 pm)
- **Project Alternatives with Advantages and Disadvantages**
  - Range of alternatives considered and viable alternatives
  - Advantages and disadvantages of alternatives.
  - SWG member comment.

  (Royce Conlon P.E., PDC Inc. Engineers) (2:15 pm-3:15 pm, with break as needed)
- **Status on Other Project Activities and Next Steps**
  (Royce Conlon) (3:15-3:30 pm)
- **Adjourn** (3:30 pm)

Pre-meeting packet: final "Aviation Activity and Facility Requirements" report, draft "Alternatives Analysis" report, SWG meeting #2 notes

Thank you for your time and participation!

TECHNICAL MEMORANDUM

Client #	54857	Date	February 29, 2015
PDC #	14075FB	Prepared by	Royce Conlon, PE, Ken Risse, PE
Project Name	Seward Airport Improvements	Reviewed by	KR/AS/KK
Subject	Location Study/Alternatives Memo		

Topic	Discussion
Introduction	The Alaska Department of Transportation and Public Facilities (DOT&PF) is proposing to improve the airport at Seward, Alaska. The State of Alaska owns and operates the Seward Airport, which includes a paved main runway (13-31), a paved crosswind runway (16-34), multiple taxiways, and two aprons. Seward is located on the Kenai Peninsula at the north end of Resurrection Bay, approximately 75 air miles or 125 highway miles southwest of Anchorage. The Seward Airport primarily serves the City of Seward and residents of the area between Seward and Moose Pass. Local residents use the airport for travel to Anchorage and Prince William Sound. Tour operators also use the airport as a base for sightseeing tours of Kenai Fjords National Park via airplane and helicopter. The number of operations at the airport is much higher in the summer than in the winter.
Background	Most of the Seward Airport is located within the floodplain of the Resurrection River Delta. The frequency with which Runway 13-31 has been overtopped by the Resurrection River has increased significantly in recent years. During the 13 years from 1995 to 2008, the runway was overtopped at least four times. During the four years from 2009 to September 2013, the runway was overtopped 15 times. These instances were limited initially to the fall, but they are now occurring in the summer as well (June to November). Recent changes in channel morphology have rendered the existing riprap along the eastern side of the runway inadequate. Without additional protection, erosion and overtopping of the runway will continue and DOT&PF will keep pouring maintenance funds into the river. Recent testing of the main runway embankment shows an insufficient bearing capacity to support large aircraft. Frequent flooding is thought to have contributed to a weakened embankment under the pavement. As a result, landings by larger aircraft have been restricted. The Seward Airport Improvements project has two primary purposes. The first is to develop engineering solutions that will protect the airport facilities from further damage caused by recurrent flooding, and the second is to correct deficiencies that may exist based on the airport's forecast function and Federal Aviation Administration (FAA) design standards. The first task of the project was to review the recommendations of the 2008 Airport Master Plan (AMP) and revisit the project's purpose and need. In the light of recent flood and erosion events, as well as potential changes in airport activity and funding constraints,

Topic	Discussion
	refinements of the 2008 recommendations were anticipated. A draft technical memorandum titled *Aviation Activity & Facility Requirements* was prepared in September 2014. That memorandum presents the past aviation activity and forecast future activity, as well as the mix of aircraft type. It is the future demand that drives recommendations for the facility requirements. The memo was reviewed by DOT&PF and then by the Seward Working Group (SWG), group established to maintain regular communication between the project team and key stakeholders impacted by the project, namely, the City of Seward, local pilots, and adjacent landowners. The memo was reviewed by DOT&PF and then the SWG in November 2014, and after revisions, again in July 2015. The memo's recommendations included a long-term plan for a 4,000-foot runway meeting Design Group II dimensional standards, with a near-term recommendation for a 3,300-foot runway. At the November 2014 SWG meeting, members strongly voiced the importance of a 4,000-foot runway, noting that the longer runway was justified given projected increases in population and economic development. In general, SWG members wanted to see alternatives with a length similar to the existing main runway (4,249 feet) and asked that reconstruction of the existing runway to withstand the erosive forces be considered. The project team further studied the economic data and other resources provided by the SWG, and revised the document. Recommendations from that revised document were presented to the SWG in July 2015. Consensus was reached that a 3,300-foot runway length was acceptable for the near term. Allowances would be made for a future runway length of 4,000 feet. An increase in economic activity or initiation of commuter air service would support the longer runway length. ***This technical memorandum documents the alternative development and evaluation process. It will be combined with other technical memoranda and special reports (such as the Hydrology & Hydraulic Analysis report) to produce the Scoping Report.***
Design Standards	The draft *Aviation Activity & Facility Requirements* technical memorandum documents the facility requirements, which drive the layout of the alternatives. For development and evaluation of initial alternatives, only the primary elements of the airport facilities—the runway and taxiway—were considered. Key dimensional standards are summarized below.

Runway	**Runway Dimensional Standards for Various Scenarios**

Topic	Discussion

Feature	Current Based Aircraft Group	Current Demand & Medevac (Beech 200) Recommended for Near-Term Development	Growth Scenario & Emergency Preparedness (Beech 1900) Long Term Plan	Existing RW 13-31
Approach Category*	A	**B**	B	B
Aircraft Design Group**	I	**II**	II	II
Runway Length	3,300' (Note 1)	**3,300' (Note 1)**	4,000'/4,700' (Note 2)	4,249'
Runway Width	60'	**75'**	75'	100'
Visibility Minimums	1 mile	**1 mile**	1 mile	1 mile
Crosswind Component	10.5 knots	**13 knots**	13 knots	13 knots
Runway Safety Area	120' x 3,780'	**150' x 3,900'**	150' x 4,600’	150’ x 4,749'
Object Free Area	400' x 3,780'	**500' x 3,900'**	500' x 4,600’	500' x 4,749'
Runway Protection Zone	1,000' x 500' x 700'	**1,000' x 500' x 700'**	1,000' x 500' x 700’	1,000' x 500' x 700'
Part 77 Primary Surface	500' x 3,700'	**500' x 3,700'**	500' x 4,400'	500' x 4,649'
Part 77 Approach Slope	20:1 (Visual)	**20:1 (Visual) (Note 3)**	20:1 (Visual) (Note 3)	20:1 (Visual)

* Approach Category: a letter code, A-E, that classifies aircraft based on the speed at which the aircraft approaches a runway for landing. Category A aircraft approach at a slower speed than Category E aircraft; the higher the approach speed, the longer the runway needed.
**Aircraft Design Group: a numerical code, I-VI, that groups aircraft by wingspan range. Group I has the smallest wingspan range; Group VI aircraft has the widest wingspan range. The wider the wingspan range, the wider the runway.

1. Minimum runway length for community class airports per Alaska Aviation Preconstruction Manual exceeds FAA Advisory Circular (AC) 150/5325-4B (2,750 feet for 95% of fleet or 3,250 feet for 100% of fleet) and Beech 200 published takeoff and landing distances.
2. The 4,700-foot length is based on FAA AC 150/5325-4B for aircraft over 12,500 lbs. but less than 60,000 lbs. (75% of fleet at 60% useful load). FAA is circulating a Draft AC 150/5325-4C, which recommends using the manufacturer’s airport planning manuals for all airplanes over 12,500 lbs. The Beech 1900D specification and performance sheet lists a takeoff length of 3,737 feet. Discussions with the primary air carrier in Alaska using this aircraft indicated a need for a 4,000-foot runway to accommodate it. A 4,000-foot runway option is being considered, which would accommodate the Beech 1900 and other large aircraft such as the Dash 8 and Sherpa.
3. By definition, a non-precision instrument (NPI) approach runway means a straight-in approach is planned or has been approved (Part 77.2). Seward Airport’s approach is currently a circling approach (RNAV [GPS]-A). Review of the FAA flight standards and local topography indicates a straight-in approach is not viable at Seward due to the mountainous terrain on all sides.

Taxiway

Taxiway and Taxilane Design Dimensions Based on Aircraft Design Group (per AC 150/5300-13A, Table 4-1)

Feature	Near Term & Ultimate – B-II (Beech 200 & Beech 1900)	Existing
Runway to Taxilane Separation	240'	184' (Note 1)
Taxiway Safety Area	79'	79'
Taxiway Object-Free Area (OFA)	131'	131'
Taxilane OFA	115'	131'
Taxilane Centerline to Fixed or Movable Object	57.5'	
Taxilane Wing Tip Clearance	18'	

1. Separation distance shown on 2008 ALP between Runway 16-34 centerline and general aviation (GA) apron taxilane (A-I Small requires 150 feet).

To meet the dimensional standards above and preserve the existing building restriction line

Topic	Discussion
	(BRL) and general aviation (GA) apron size, a runway parallel to the apron (Runway 16-34) would need to have a runway-to-BRL separation of 394.5 feet; the existing Runway 16-34 is separated from the BRL by only 300 feet. Additional separation may be needed to correct the layout deficiency of taxiways that provide direct access from the runway to aircraft parking areas.

Initial Alternative Development

Development of design alternatives requires an understanding of existing conditions and considerations that could impact the reasonableness of any alternatives. Information gained from site visits, data collection, public involvement, and coordination with airport stakeholders, combined with the facility requirements listed above, influenced the identification and development of alternatives for the Seward airport.

Considerations and Constraints in Developing Alternatives

- Surrounding topography that limited the practicality of airport relocation (see map, right)
- The need to consider different runway lengths to provide various potential levels of service to the community
- The Federal Emergency Management Agency (FEMA) defined floodway, floodplain, and coastal flood zone (VE) designations, which affect layout and build elevations for the facilities
- Adjacent built features (such as the railroad, roads, etc., at the northern end of the airport) that could cause substantial cost or be impractical to relocate
- Adjacent privately owned property
- Wind coverage (determining whether a single runway could provide 95% coverage)
- Proximity of the port facilities of the Alaska Railroad Corporation (ARRC) and ARRC's future plans
- DOT&PF's decision not to dredge or reroute the channel due to the maintenance cost of continued dredging, the unpredictability of the long-term changes this could cause, and the potential for unforeseen impacts to owners of adjacent property (such as properties across the channel)

Other considerations such as cost, function, and environmental impacts of the various alternatives were used as evaluation criteria for comparing the alternatives against each other and the no-build alternative (as discussed below).

Initial Alternatives

Development of the alternatives began with five concepts initially developed for preliminary discussion at the November SWG meeting. These alternatives evolved as additional information was discovered, analysis completed, or direction provided. For instance, initial concepts for the alternatives that expanded Runway 16-34 kept the railroad and the roadway on the north end outside of the Runway Protection Zone (RPZ). Subsequently, consultation between DOT&PF and FAA determined that this was not a constraint.

Topic	Discussion
	Once the layouts were defined, the next step was to determine the appropriate hydrological parameters, such as flood frequency and freeboard (a measure of the relative height of the flood line), to use to set the surface elevations of the runways. To establish these parameters, hydrologists from Hydraulic Mapping and Modeling (HMM) and DOT&PF drafted a series of technical memoranda and other coordination documents (copies are attached) that were then discussed among the consultant team and DOT&PF. These actions culminated in the decision to use the 100-year (Q100) flood frequency and a freeboard of 2 feet. This decision agrees with draft Federal guidance. Another consideration that was identified during discussion of the hydrological parameters was the closure of Runway 13-31. If Runway 13-31 were closed, the embankment could be either (a) armored to serve as a dike to prevent lateral migration of the main channel and therefore protect an improved and expanded Runway 16-34, or (b) it could be left as is, allowing future flood waters to breach it. In either case, Runway 16/34 would need to be armored, because the closed runway would not be raised to prevent flooding. Armoring of the closed runway was considered in Alternatives 2.1a and 2.2a. These options were dropped because of the higher cost to armor both runways and these options provided no additional benefit to the airport facilities when compared with options that armored Runway 16/34 only. The process of refining the original five concepts resulted in the eight alternatives presented in the table below. In coordination with DOT&PF, it was determined that evaluating only the three highlighted alternatives would be sufficient to provide viable options for selecting the airport layout(s) to carry forward into design. If the initial analysis should indicate that other alternatives seem prudent, the details of the first three could be refined to match elements of the others.

Topic	Discussion
	
Dropping of Alternative 1.2 from Further Evaluation	Alternative 1.2 would reconstruct Runway 13-31 without raising the runway elevation. As compared to Alternative 1.1, this solution would reduce potential impacts to the mapped floodway, but at the cost of allowing the runway to be flooded on a frequent basis. This option was not carried forward for more detailed review because it was considered impractical: • The runway would be unreliable due to the frequent flooding. • Construction costs would be as much as 50% higher than for Alternative 1.1 due to the thicker embankment, the use of crushed rock wrapped in geotextile, and the installation of floodwater erosion protection on the west side of the runway. • Maintenance and operation (M&O) costs would be substantially higher to cover frequent clearing of the debris after each overtopping event plus likely additional costs to repair pavement and airport lighting. An initial analysis indicates overtopping would occur for at least 12 to 21 days each year. However, this likely underestimates the overtopping duration because of the shortness and age of the discharge record period (1964–1968) and the fact that the years in that record were low-average years.

Topic	Discussion
Alternative Refinement and Consultant Team Evaluation Process	The more detailed development of the alternatives was also an iterative process. • HMM provided preliminary design flood (Q100) elevations. • PDC modeled the alternatives; based on the Q100 elevation and 2-foot freeboard, the alignment of Runway 16-34 shifted (Alternatives 2.2a and 3) so that Taxiway grades would meet FAA standards. • HMM modeled the alternatives with HEC-RAS (a computer program that predicts the hydraulics of water flow), determined initial impacts to the flood elevations (including coastal flooding effects from the 1%-annual-chance tide event, which govern up to Cross-Section E), and identified potential scour velocities and depths. This resulted in further refinement of the alternatives. • The scour depths and velocities resulted in preliminary recommendations for riprap size, thickness, and volumes (to accommodate scour). • PDC estimated earthwork quantities, including the excavations necessary to install the riprap. The key elements of the finalized concept alternatives are presented below. All alternatives meet the dimensional and grading standards for Design Group II. Figures depicting each of the alternatives, including the extents of erosion protection and the riprap size and thickness, are attached for reference.
Refined Alternatives	**Alternative 1.1** Reconstruct and Raise Runway 13-31 (4,249 feet long) • Raise Runway 13-31 above the 100-year flood level (Q100) with 2 feet of freeboard • Install armor to protect Runway 13-31 • Adjust Runway 16-34 profile on the north end to match into raised profile of Runway 13-31 • Reconstruct Taxiways B and C to match into Runway 13-31 raised profile • Eliminate entrance Taxiways A, D, and E in accordance with new FAA guidance that disallows taxiways entering the runway in the middle one/third of the runway. **Alternative 2.2** Close Runway 13-31 and Reconstruct Runway 16-34 (3,300 feet long) • Shift Runway 16-34 to the east and raise it above 100-year flood level with 2 feet of freeboard (shifting the runway minimizes changes to the apron and adjoining lease area/buildings) • Install armor to protect Runway 16-34; since Runway 13-31 will be overtopped and subsequently breached, flood water will reach this embankment • Relocate Taxiway B and reconstruct Taxiway F to match into Runway 16-34 location and grade changes • Eliminate entrance Taxiways A, C, D, and E in accordance with new FAA guidance **Alternative 3.0** Close Runway 13-31 and Reconstruct Runway 16-34 (4,000 feet long) • Close Runway 13-31; flood water will overtop the embankment and eventually breach it • Shift Runway 16-34 to the east and raise it above 100-year flood level with 2 feet of freeboard (shifting the runway minimizes changes to the apron and adjoining lease

Topic	Discussion
	area/buildings) • Install armor to protect Runway 16-34 in anticipation of Runway 13-31 being breached • Relocate Taxiways B and F to match into Runway 16-34 location and grade changes • Eliminate entrance Taxiways A, C, D, and E in accordance with new FAA guidance
Evaluation	Evaluation criteria were developed by the consultant team in conjunction with DOT&PF. The criteria were selected to aid in evaluating the important differences between each of the alternatives. The criteria can be broadly grouped into four primary categories: • Cost • Ability to serve the community's needs • Engineering and user considerations or function • Environmental considerations The attached matrix provides a narrative of the advantages and disadvantages of each alternative. The construction cost comparison only considers the key differences between the alternatives under evaluation and does not include all costs that could be associated with reconstruction. For instance, mobilization and demobilization would be similar for each of the projects and thus were not considered a differentiating item, whereas embankment items such as borrow, riprap, and pavement are substantially different between the alternatives. Right of Way costs are approximate planning-level estimates based on the additional area of flooding and the assessed value of the flooded property. No jurisdictional agency scoping has been completed at this point. Anticipated environmental impacts were based largely upon evaluations presented in the 2008 Environmental Assessment and the experience of the consultant team. We feel this level of analysis suffices for this conceptual stage of the evaluation. The consultant team and the DOT&PF held two work sessions to compare the alternatives, reviewing each criterion and comparing each alternative against the no-build and against each other to ascertain the relative magnitude of difference. Alternative 2.2 appears to provide the best solution when comparing the advantages and disadvantages of this alternative against the others. SWG and public input should be considered before determining which alternative to progress as the preferred engineering alternative to carry forward into the Environmental Assessment where it will be compared to the no-build option.

Attachments

Evaluation Matrix	Alternatives for Consideration_Eval Criteria.xlsx

Topic	Discussion
Figures	1. Alternative 1.1 – Plan 2. Alternative 2.2 – Plan 3. Alternative 3.0 – Plan 4. Alternative 1.1 – Profile 5. Alternatives 2.2. & 3.0 – Profile 6. Alternative 1.1 - Typical Section 7. Alternative 2.2 & 3.0 – Typical Section 8. Part 77 Airspace
Reference Materials	1. Final Hydrologic and Hydraulic Report, Seward Airport Improvements Project 2. Draft Design Discharges Return Interval (1/23/2015, by Paul Janke, DOT&PF) 3. Geotechnical Input on Conceptual Designs (2/20/15 and 3/18/15, by Shannon & Wilson, Inc.) 4. Selected Correspondence

Seward Airport **Alternative Evaluation**

Alternative Descriptions	Alternative 1.1	Alternative 2.2	Alternative 3
Main Runway Disposition	Raise the main runway (maintain existing length and embankment width) - protect from overtopping and protect from erosion	Allow main runway to be overtopped by floodwaters	Allow main runway to be overtopped by floodwaters
Crosswind Runway (CW) Disposition	Raise crosswind runway on north to match raised main runway.	Offset CW runway from apron to allow Design Group II aircraft; shift threshold north to avoid VE impacts; widen to 75' (150' safety area) and lengthen to 3300' (3900' safety area)	Offset CW runway from apron to allow Design Group II aircraft; shift alignment to avoid ARRC on south end, shift north to reduce impact in VE zone; widen to 75' (150' safety area) and lengthen to 4000' (4600' safety area)
Hydraulic Analysis	Use Q100 with 2-foot freeboard on main runway. This option is within the floodway; consider impacts to properties due to change in the floodway.	Use Q100 with 2-foot freeboard on CW; raise CW elevation; provide erosion protection	Use Q100 with 2-foot freeboard on crosswind; raise CW elevation; provide erosion protection; provide protection for the portion in the VE zone

Evaluation Criteria	Alt 1.1 Advantage	Alt 1.1 Disadvantage	Alt 2.2 Advantage	Alt 2.2 Disadvantage	Alt 3 Advantage	Alt 3 Disadvantage
Cost						
Construction/Earthwork Cost - for comparison only -Not total project costs		$13 million		$11 million		$16 million
Maintenance & Operations (M&O)	Acts as a levee to protect the apron from 100-year flood	More snow removal and pavement surface to maintain than others - assumes the erosion protection is stable/permanent and no additional costs for M&O within the design life. More lighting and pavement markings to maintain.	M&O costs will be less; pavement and lighting for only one runway;new runway embankment acts as a levee to protect the apron from flooding	Maintain closed runway markings; assumes the stabilization is permanent and no additional costs for M&O within the design life	M&O costs less than existing. Only one runway with pavement and lighting to maintain . Embankment acts as a levee to protect the apron from flooding	Similar to Alt 2.2; although slightly more because the longer runway requires additional maintenance due to extra pavement, markings, lights, etc.
Right of Way --preliminary costs only		$1,300,000		$950,000		$950,000
FAA Funding Eligibility	Generally easier to get approval of work on existing facility	Two runways may be seen as unwarranted; Environmental Impacts could trigger scrutiny of funding	Should be eligible	None	Should be eligible for FAA funding up to 3300' length.	4000' length would require other funding sources to supplement the FAA funding.
Ability to Serve the Community's Needs						
Medevac	Longest runway - best for jets; also see wind coverage. Allows C-130 access in case of a mass casualty event (very infrequent need).		Serves the King Air 200, provides for basic medevac service	Too short for jets	Longer than Alt 2.2, 4000' length preferable for King Air pilots	Too short for long-range jets with destinations outside of Alaska
Meets General Aviation	Improves Runway. Exceeds the forecasted aviation needs.		Improves Runway most often used and adds length. Wider/longer runway accomodates operational tolerance during occasional strong winds.		Improves Runway most often used and adds length. Wider/longer runway accomodates operational tolerance during occasional strong winds.	
Search and Rescue	Improves Runway		Better Apron Access	Eliminates Longer Runway	Better Apron Access	Shorter than Alternative 1.1
Economic Development	Longest runway - supports occasional use by Lear jets, tourism opportunities, larger cargo and passenger planes; improves reliability (runway open under a greater range of conditions) and potential for aviation-related business development at the airport including Lear jets and commuter operations	No change to apron area, which limits use of large aircraft on the apron, thus limits business development.	Runway offset provides for larger aircraft (DG II) on the apron taxilane; provides more areas for use by larger aircraft and thus could provide FBO's with greater operational area	Runway too short for Beech 1900 commuter service	Runway offset provides for larger aircraft (DG II) on the apron taxilane; longer runway facilitates use by FBO's including commuter aircraft and some short range jets	
Safety, Engineering & User Considerations (Items not covered by Costs)						
Wind	Two runways provide slightly better wind coverage for small aircraft. Combined coverage DG II =99.93, DG I = 99.64	Longer runway (13/31) orientation is not as good as the "crosswind" runway. RW 13/31 coverage DG I = 91.1%, DG II = 96.0%	Provides longer/wider runway for best wind coverage orientation; DG I = 98.6% ; DG II = 99.53%. A number of pilots seem to favor improving the cross-wind versus the main runway.	Slightly reduced coverage due to single runway but meets FAA guidelines for a single runway.	Provides longest runway for best wind coverage orientation; DG I = 98.6% ; DG II = 99.53%. A number of pilots seem to favor improving the cross-wind versus the main runway.	Slightly reduced coverage due to single runway but meets FAA guidelines for a single runway.
Airspace/Runway Protection Zone (RPZ)/Approach Obstructions	**Airspace**: Higher runway, slightly less penetration of airspace	**RPZ**: Main runway has undesirable uses in the RPZ, (Public Road, Railroad) **Approach:** Existing obstructions in the RW 13 approach (road, railroad) would remain. ARRC is planning barge loading/unloading facilities under the approach of RW 34	**Approach:** Horizontal shift of runway moves the RW 34 approach away from the proposed ARRC development; Closing the main runway significantly reduces RW 13 RPZ obstructions.	RPZ: ARRC development for barge operations (jetty, access road) may occur in RPZ.	**Approach**: Horizontal shift of runway moves the RW 34 approach away from the proposed Alaska Railroad development. Significantly reduces RW 13 RPZ obstructions.	RPZ: ARRC development for barge operations (jetty, access road) may occur in RPZ. RPZ and approach extend into the planned ARRC barge basin.

Alternative Descriptions	Alternative 1.1	Alternative 2.2	Alternative 3
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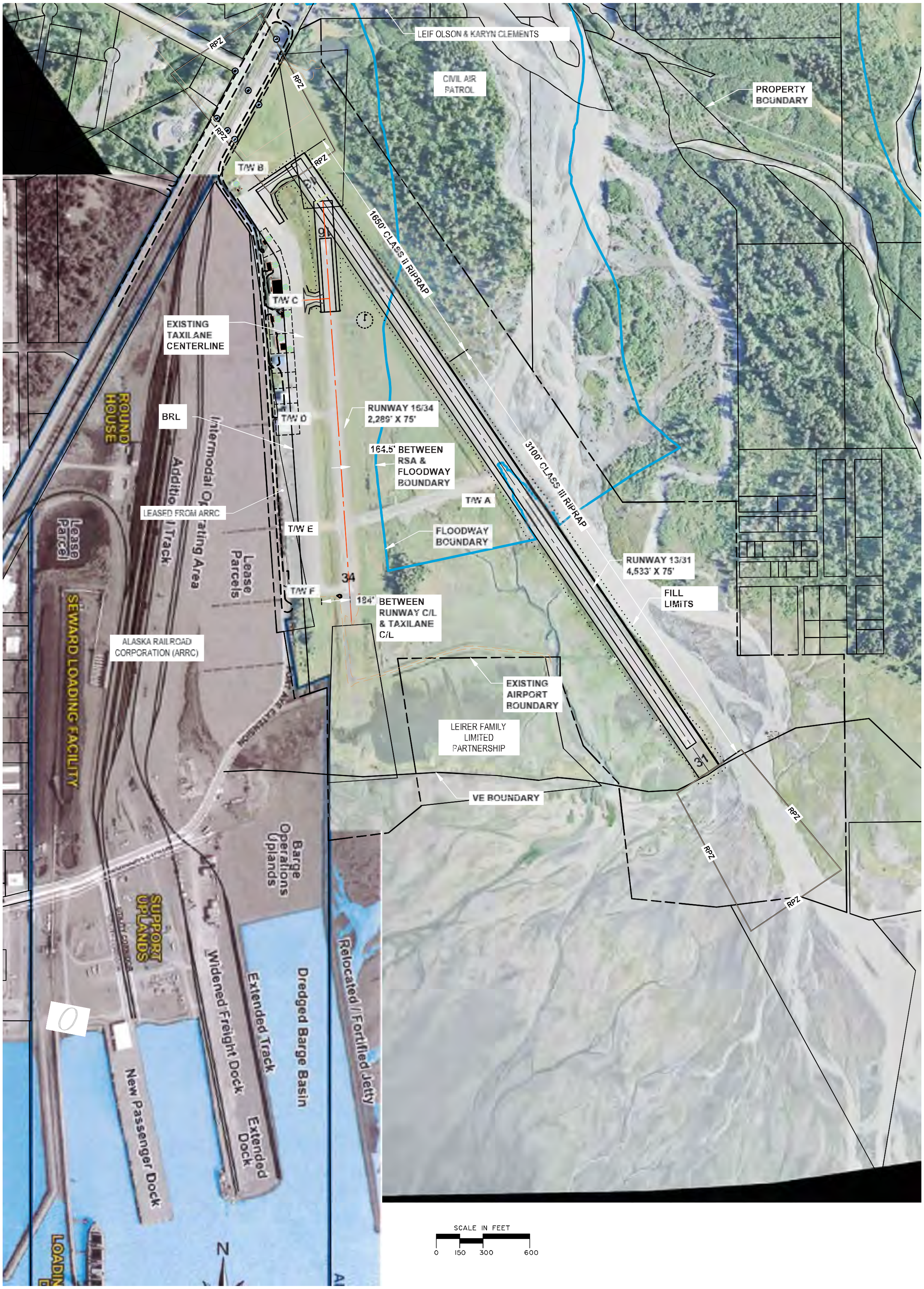
Hydraulic Analysis	Use Q100 with 2-foot freeboard on main runway. This option is within the floodway; consider impacts to properties due to change in the floodway.	Use Q100 with 2-foot freeboard on CW; raise CW elevation; provide erosion protection	Use Q100 with 2-foot freeboard on crosswind; raise CW elevation; provide erosion protection; provide protection for the portion in the VE zone

Evaluation Criteria	Alt 1.1 Advantage	Alt 1.1 Disadvantage	Alt 2.2 Advantage	Alt 2.2 Disadvantage	Alt 3 Advantage	Alt 3 Disadvantage
User Function/Runway Reliability/ Level of Service (LOS)	Uses existing VASI approach aids; Higher (above the flood) runway will improve the reliability of the airport; LOS is slightly higher because capacity is increased	Long taxi path; requires displaced threshold to meet RSA requirement.	Lengthens the runway along the orientation for prevailing winds; meets the needs of the based aircraft; improves apron expansion opportunities; reduces congestion; provides full safety area; Higher (above the flood) runway will improve the reliability of the airport. Shorter taxi path.	Large infrequent aircraft, such as Coast Guard C-130 will be unable to use as well as some larger commuter aircraft.	Lengthens the runway along the orientation for prevailing winds; improves apron expansion opportunities; reduces congestion; provides full safety area. Higher (above the flood) runway will improve the reliability of the airport. Shorter taxi path.	Still limits use by infrequent large aircraft, but functions well for based aircraft, medevac, and future commuter aircraft; Single runway provides lower LOS than two runways
Long-Term Stability/Risks	On existing embankments, which are stable except for erosion.	Greater risk of flood damage since the river is next to the runway and the "model" has variables; climate change could affect river flow; additional sediment deposition unpredictable. Requires reconstruction of runway to meet bearing capacity requirement	R/W provides flood protecton for apron. Runway is sited further from the river, less potential for flood impacts.	Potential risk to downstream (ARRC) facilities if the river moves	Provides flood protecton for apron. Runway is sited further from the river, less potential for flood impacts.	Potential risk to downstream (ARRC) facilities if river moves; is within VE zone and susceptible to tidal influence (greater potential effects from sea level rise).
Construction Considerations		Riprap installation below water, in river channel, more difficult. Construction likely delayed (as much as 2 years) by a CLOMAR/ LOMAR process with public hearings.	No riprap placement into river channel. Results in easier installation.	Construction phasing will be most challenging. If excavation from abandoned runway is used for fill, both runways will be under construction concurrently.	Same as Alt 2.2.	Runway extends out into tidally influenced region. Requires extension of Riprap into the tidal zone. CLOMAR/ LOMAR may be required and could delay construction, but expected to be easier and quicker to obtain than Alt. 1.1. Longer runway is more flexible for construction phasing.
Environmental Considerations						
Floodplain/Floodway Impacts	Provides flood protection for apron since runway acts a levee. Raises Main RW 2 feet above 100-year flood level.	In the floodway - increases the flood elevation by up to 4', impacts additional private properties. Permitting will face more obstacles due to public process and floodway impacts = expensive and time delays. Impacts the floodway - requires revision to the FIRM map. Process includes public involvement.	Provides flood protection for apron since runway acts a levee. Does not impact the floodway - no change to the FIRM map needed. Eventual breach of main runway would partially remove an obstruction in the floodplain/ floodway.	Greater chance for channel movement into the floodplain when flood waters breach the main runway. In floodplain - increases the flood elevation by <1 foot (with coastal flooding considered); (however based on previous discussions by DOT with FEMA and City 1' rise is okay)	Provides flood protection for apron since runway acts a levee. Eventual breach of main runway would partially remove an obstruction in the floodplain/ floodway. Construction penetrates the VE zone, but is still more likely permittable than Alt 1.1.	Greater chance for channel movement into the floodplain when flood waters breach the main runway. In floodplain - increases the flood elevation by <1 foot (with coastal flooding considered); (however based on previous discussions by DOT with FEMA and City 1' rise is okay). Does not impact floodway but a revision to the FIRM map needed to change the limits of the VE zone.
Fish Habitat Impacts	Least impact to intertidal (coastal) EFH area for salmon and marine fish species	Requires in water work to place erosion protection; most impacts to Resurrection River mainstream, which is EFH for salmon species	Fewer impacts to intertidal EFH than Alt 3. No impacts to Resurrection River than Alt 1.1.	More impacts to intertidal EFH than Alt 1.1.	In instream impacts to the Resurrection River	Greatest impacts to intertidal EFH; but is not within marine habit.
Wetlands Impacts	No wetlands fill associated with RW 16-34.	Most impacts to wetlands from fill in River to raise RW 13-31. May be difficult to permit because Clean Water Actequires selection of practicable alternative with least impacts.	Most permittable. Fewer acres of impacts than Alt 1.1.	Similar wetland impacts to Alt 3,but less due to shorter RW).	Fewer acres of impacts than Alt 1.1.	Similar wetland impacts to Alt 2.2 but more due to longer runway. Fill for longer RW would be harder to justify.
Endangered Species Act (ESA)/Bald Eagle	Farthest from Resurrection Bay where sea lions, otters and harbor seals are known to be located. Most acceptable under ESA and MMPA	Possible bald eagle nest impacts (based on 2004 nest sites), more so than with other alternatives	Similar distance from Resurrection Bay as Alt 3. Less fill near or in the bay than Alt 3.	Fill in/near Resurrection Bay and possible bald eagle nest impacts	Similar distance from Resurrection Bay as Alt 2.2.	Least acceptable under ESA and MMPA. More fill than Alt 2.2 in/near Resurrection Bay.
Human (Socioeconomic) Impacts (ROW Impacts, Compatiable Land Use)	Greater reliability of main RW and keeping both runways provides Increased capacity, higher LOS. This option would provide additional protection for the ARRC facilities	Flood plain impacts would impact more private properties adjacent to River and the affect their property values; portions of the impacted property are undeveloped and the properties lack access.	Flooding affects reduced therefore less property impacts during Q100. Longer RW 16-34, but not as long as in Alt 3.;	Loss of main RW and short length of RW 16-34 less favorable to the City from Economic development potential standpoint. Restricts access to floatplane takeout area.	Longer RW 16-34 than Alt 2.2; provides oppuntity for larger aircraft	Loss of main RW; Restricts access to floatplane takeout area.



Alt 1.1 RECONSTRUCT EXISTING RUNWAY 13/31 (4,533ft x 75ft)

- **Raise Runway 13/31 above 100yr flood level**
- **Install armor to protect runway 13/31**
- **Adjust Runway 16/34 profile to match into raised Runway 13/31**
- **Reconstruct Taxiway B & C to match into runway modifications**
- **Eliminate Taxiways A, D & E**

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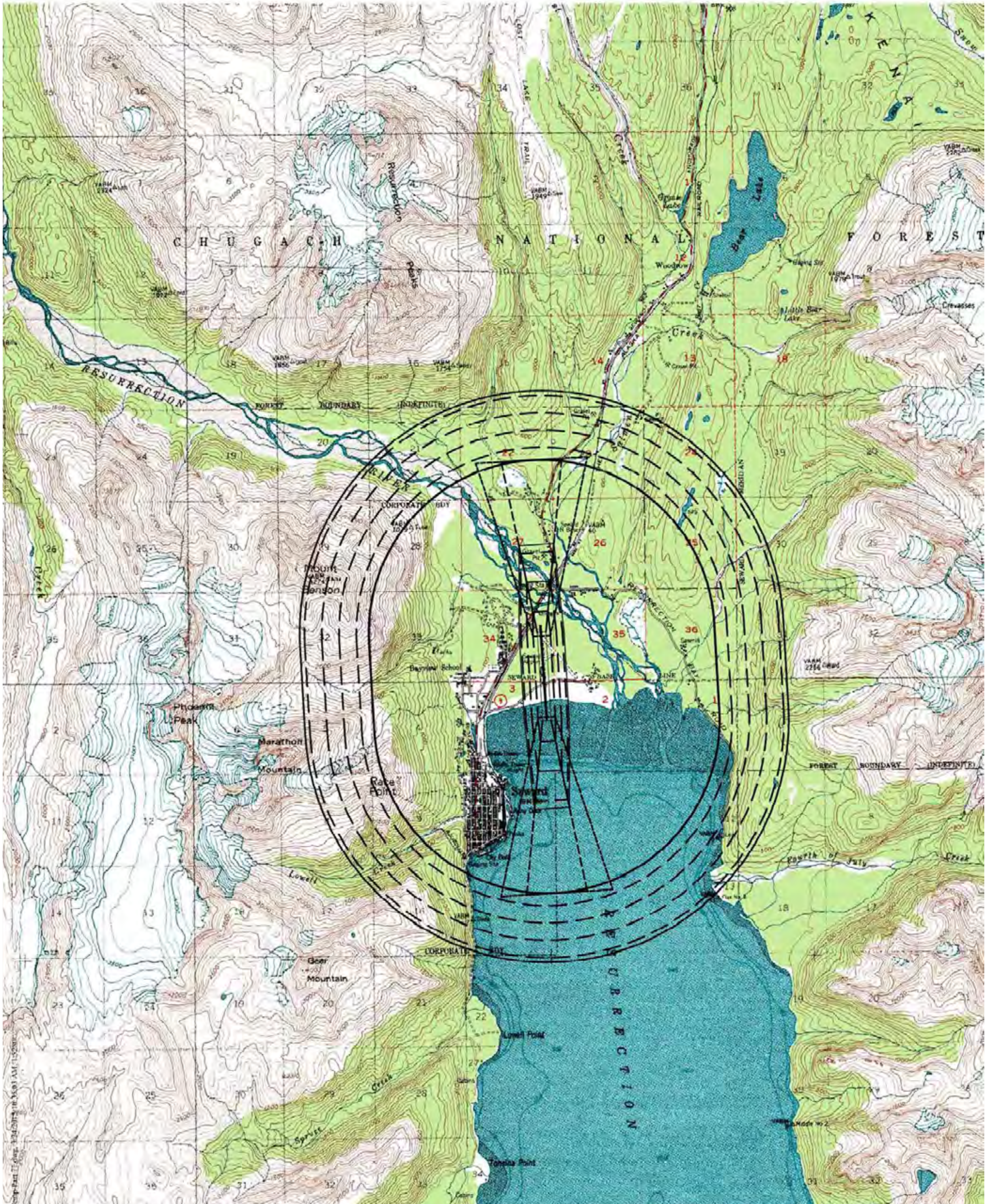
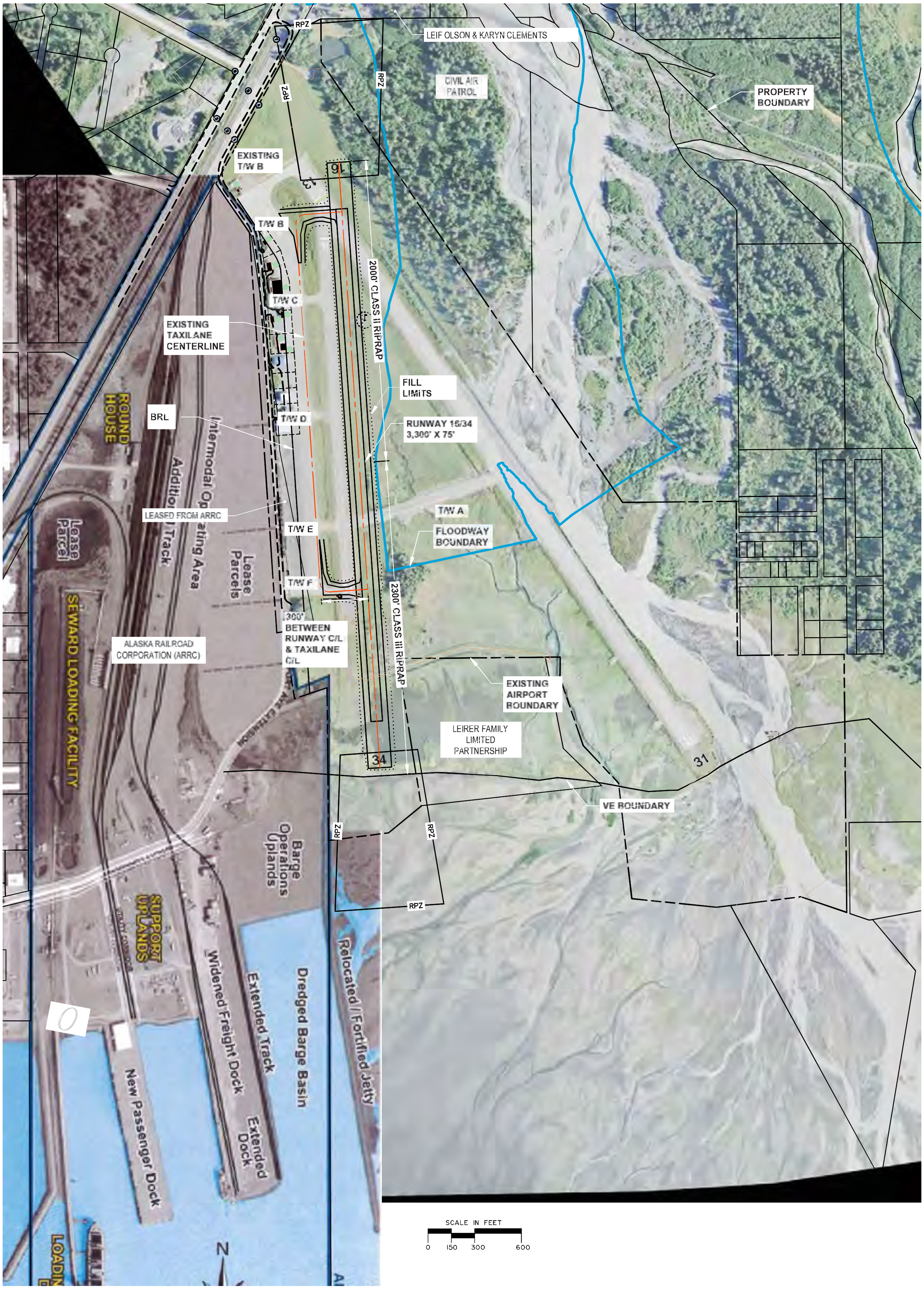

C H U G A C H
N A T I O N A L
F O R E S T
RESURRECTION
RIVER
FOREST BOUNDARY (INDEFINITE)
CORPORATE BDY
Mount Benson
Phoenix Peak
Marathon Mountain
Race Point
Seward
Bayview School
Lowell
Bear Mountain
Lowell Point
Tonsina Point
Spruce Creek
Fourth of July Creek
Bear Lake
Crevasses
RESURRECTION



Alt 2.2 RECONSTRUCT EXISTING RUNWAY 16/34 (3,300ft x 75ft)

- **Abandon Runway 13/31 and allow flood water over topping of the existing runway**
- **Raise Runway 16/34 above 100 year flood level**
- **Relocate Taxiway B to match into runway modifications**
- **Reconstruct Taxiway F to match into runway modifications**
- **Eliminate Taxiways A, C, D & E**

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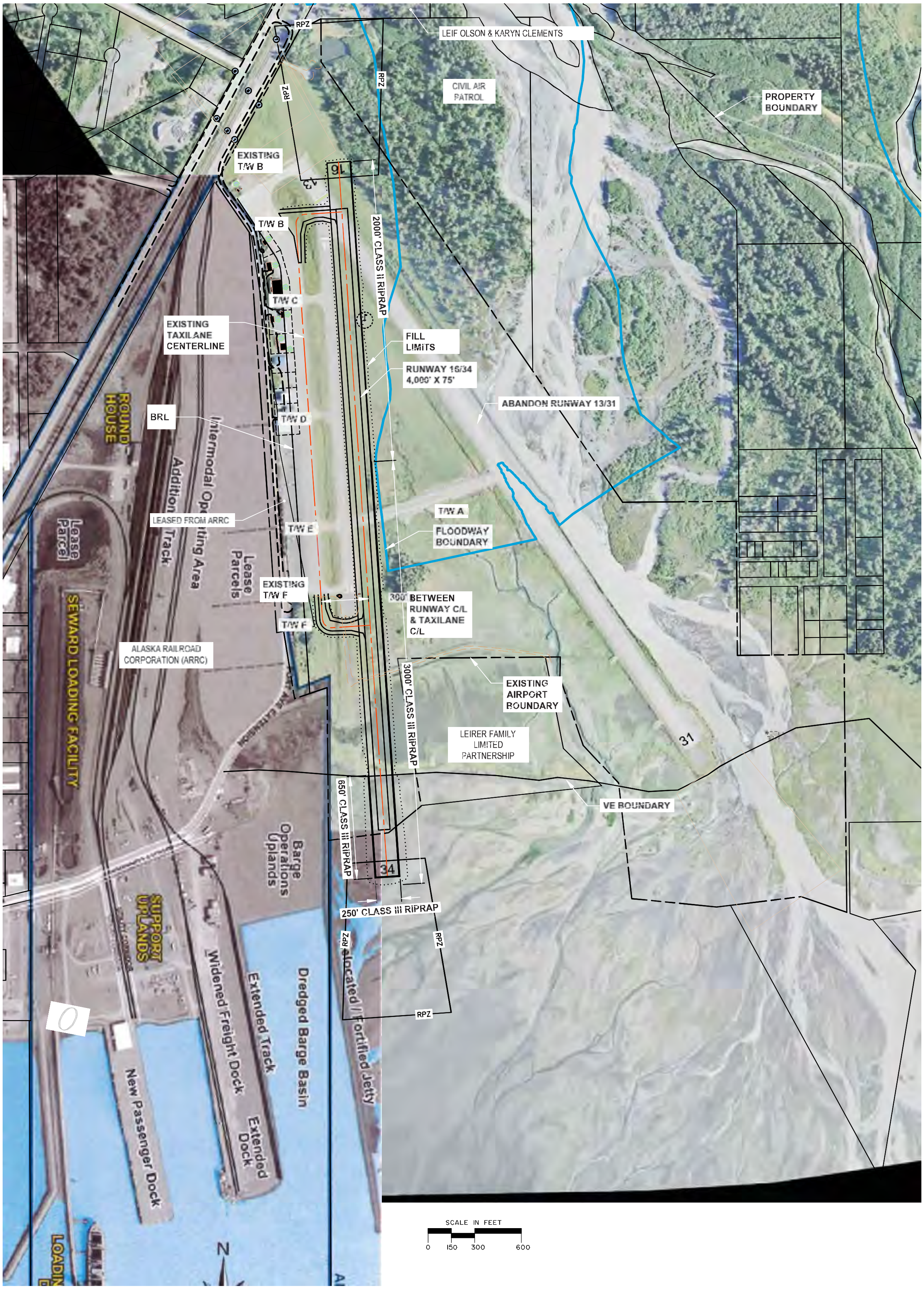
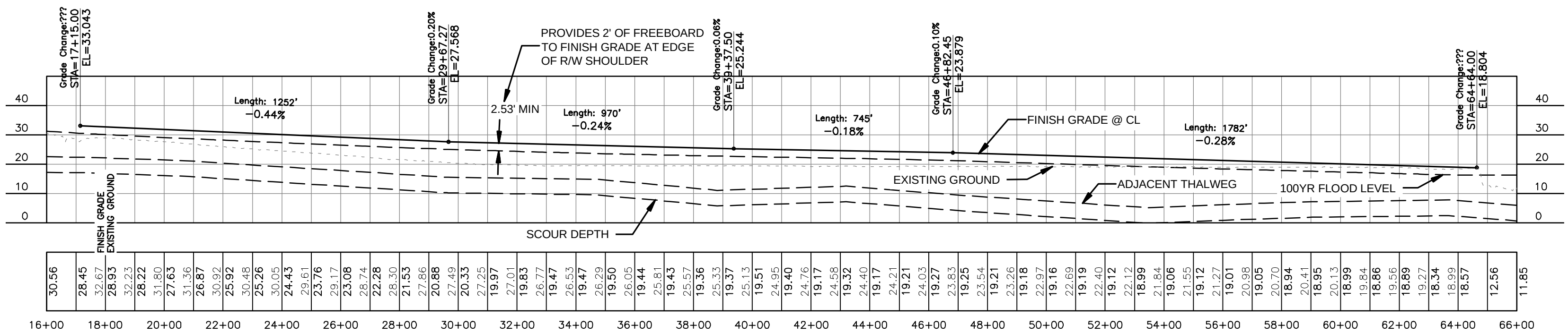
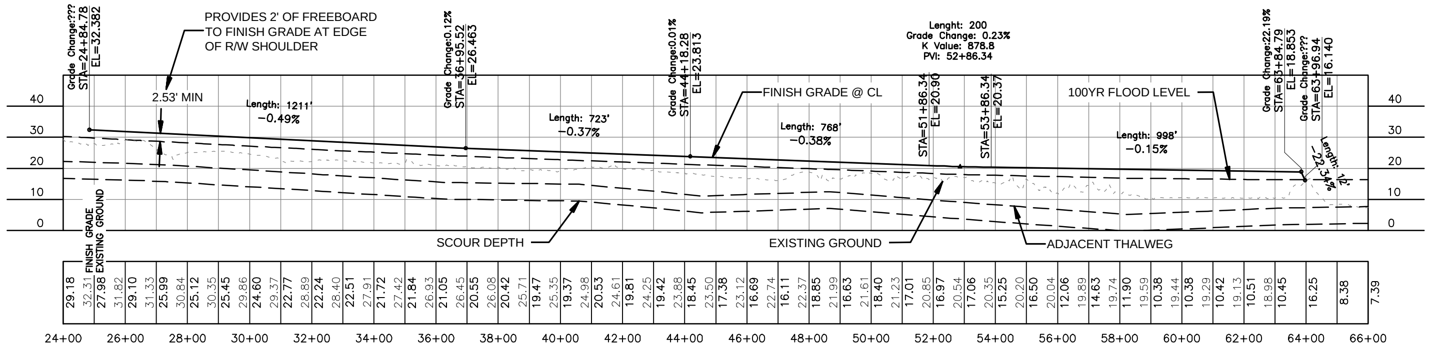


Alt 3.0 RECONSTRUCT EXISTING RUNWAY 16/34 (4,000ft x 75')

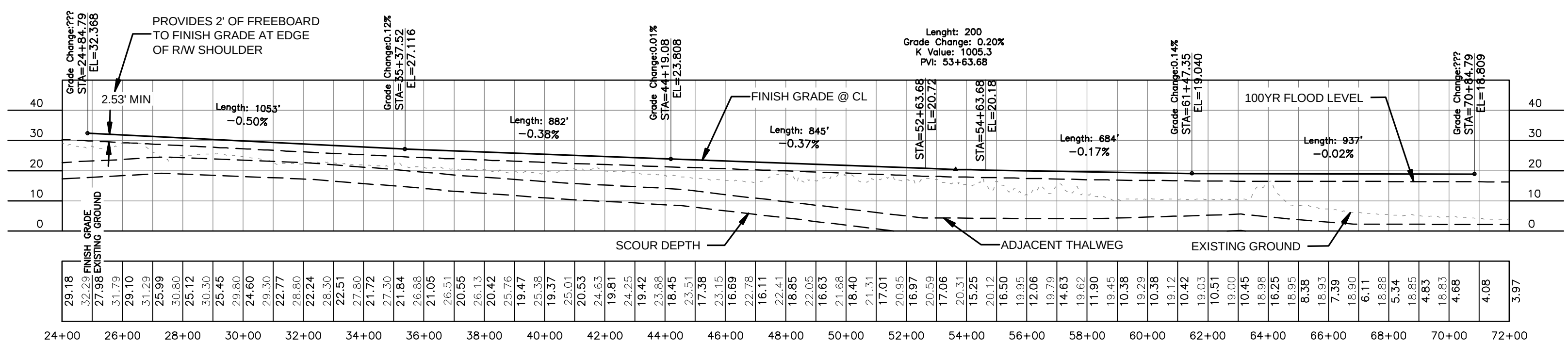
- **-Abandon Runway 13/31 and allow flood water overtopping of the existing runway and eventual breaching**
- **-Raise Runway 16/34 above 100 year flood level**
- **-Relocate Taxiway B & F to match into runway modifications**
- **-Install armor to protect Runway 16/34**
- **-Eliminate Taxiways A, C, D & E**



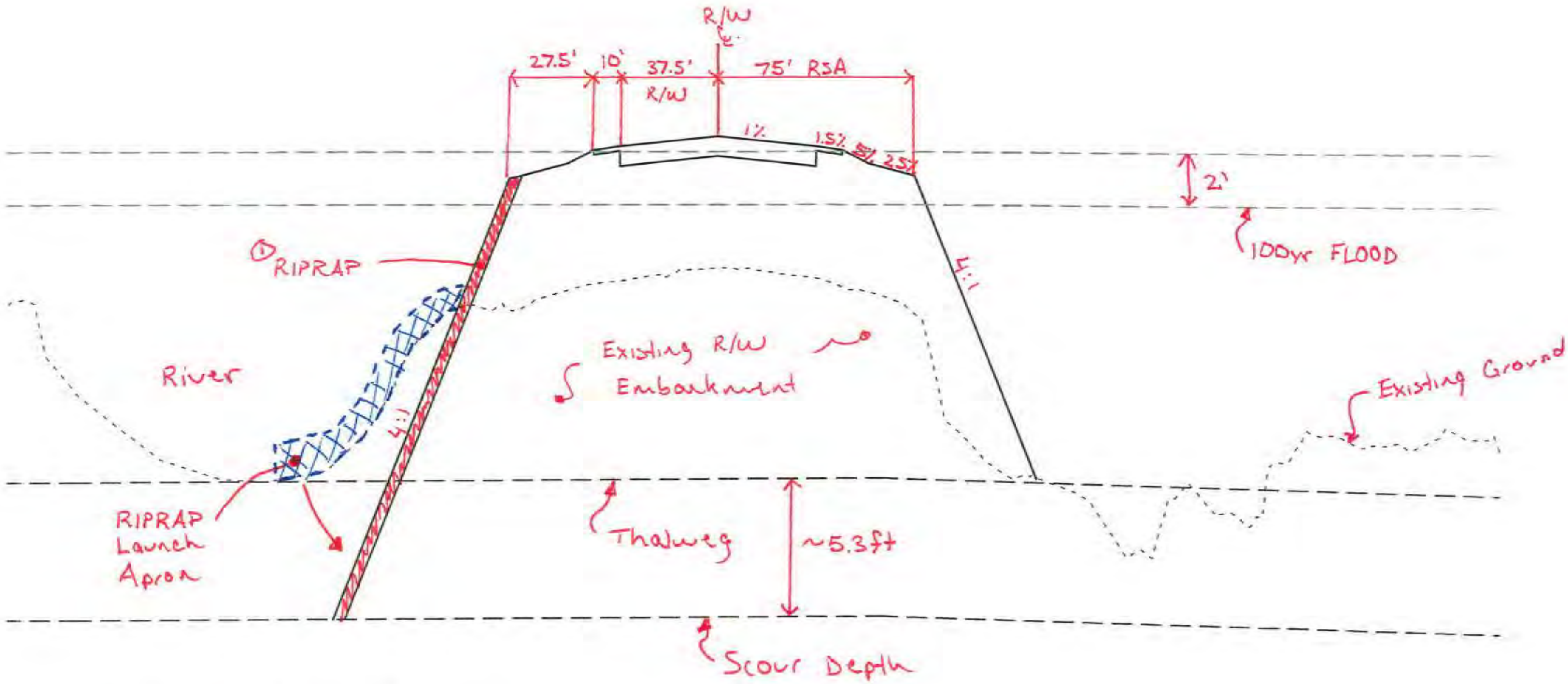
Alt 1.1 RUNWAY 13/31 (4,533ft x 75ft)



Alt 2.2 RUNWAY 16/34 (3,300ft x 75ft)

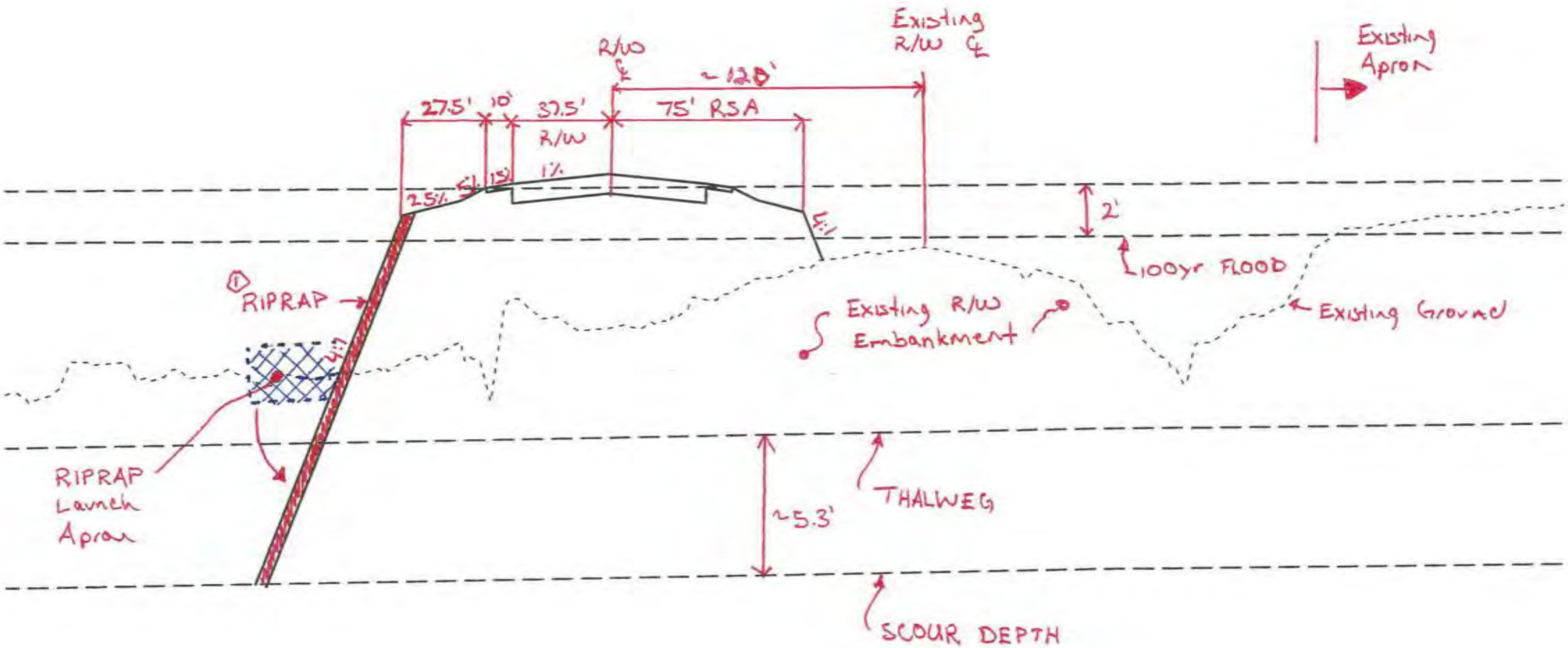


Alt 3.0 RUNWAY 16/34 (4,000ft x 75ft)



Alt 1.1: RUNWAY 13/31

① Type varies, see plan. 5' thick for Class III
3' thick for Class II



ALT. 2.2 and 3.0

① Type varies. See plan for type. 5' thick for Class III.
3' Thick for Class II.

Alaska Department of Transportation & Public Facilities

Seward Airport Improvements

April 20, 2016

- Introductions & Project Purpose

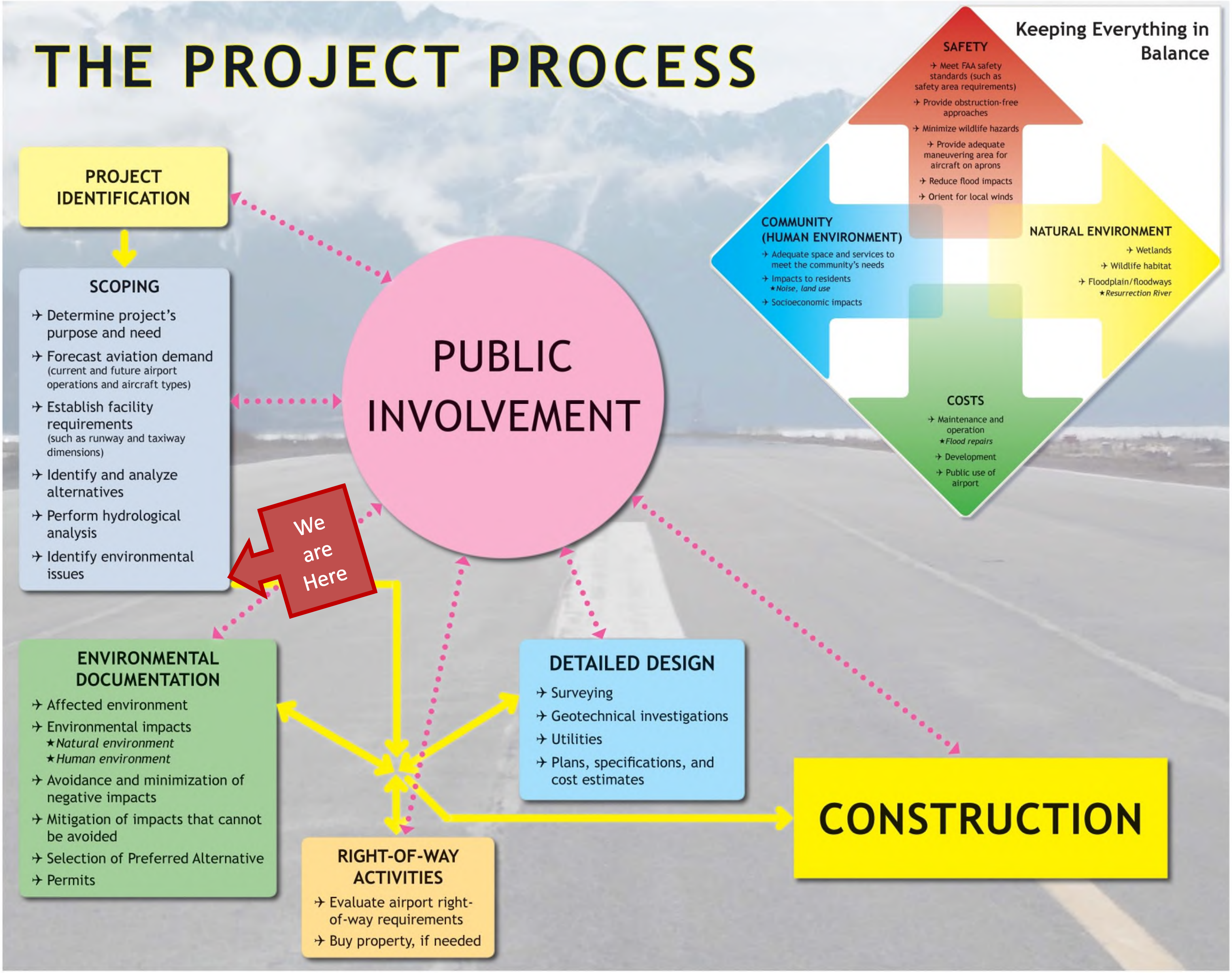
    by Robin Reich, Solstice Alaska

- Welcome

    by Barbara Beaton, DOT &PF

Project team

- **ADOT&PF**
  - Barbara Beaton, P.E.
    - Project Manager
  - Joy Vaughn, P.E.
    - Consultant Coordinator
  - Paul Janke
    - State Hydrologist
- **PDC Engineers**
  - Royce Conlon, P.E.
    - Project Manager
  - Angela Smith, P.E.
    - Project Engineer
  - Patrick Cotter, AICP
    - Project Planner
- **Solstice Alaska**
  - Robin Reich
    - Public Involvement Coordinator/Biologist
  - Carla SlatonBarker
    - Public Involvement Specialist
- **Hydraulics & H Modeling**
  - Ken Karle, P.E.
    - Project Hydrologist
- **Shannon & Wilson**
  - Kyle Brennen, P.E.
    - Geotechnical Engineer


THE PROJECT PROCESS
PROJECT IDENTIFICATION
SCOPING
Determine project's purpose and need
Forecast aviation demand (current and future airport operations and aircraft types)
Establish facility requirements (such as runway and taxiway dimensions)
Identify and analyze alternatives
Perform hydrological analysis
Identify environmental issues
We are Here
PUBLIC INVOLVEMENT
ENVIRONMENTAL DOCUMENTATION
Affected environment
Environmental impacts
★Natural environment
★Human environment
Avoidance and minimization of negative impacts
Mitigation of impacts that cannot be avoided
Selection of Preferred Alternative
Permits
RIGHT-OF-WAY ACTIVITIES
Evaluate airport right-of-way requirements
Buy property, if needed
DETAILED DESIGN
Surveying
Geotechnical investigations
Utilities
Plans, specifications, and cost estimates
CONSTRUCTION
Keeping Everything in Balance
SAFETY
Meet FAA safety standards (such as safety area requirements)
Provide obstruction-free approaches
Minimize wildlife hazards
Provide adequate maneuvering area for aircraft on aprons
Reduce flood impacts
Orient for local winds
COMMUNITY (HUMAN ENVIRONMENT)
Adequate space and services to meet the community's needs
Impacts to residents
★Noise, land use
Socioeconomic impacts
NATURAL ENVIRONMENT
Wetlands
Wildlife habitat
Floodplain/floodways
★Resurrection River
COSTS
Maintenance and operation
★Flood repairs
Development
Public use of airport

Recap of Project and The Challenges

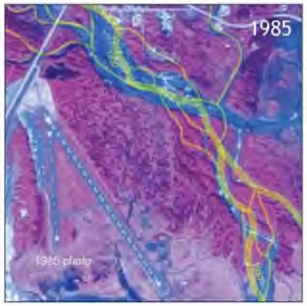
- Hydrology
- Aviation Demand
- Funding

Challenge: HYDROLOGY

River flooding has caused:

- Extensive erosion that compromises the runway's pavement structure. As floodwaters recede, fines (the binding material or "glue") in the base materials are washed out, leaving voids between the large rocks under the pavement.
- Reduction of pavement strength, resulting in weight restrictions being placed on the main runway.

Why is River Hydrology an Engineering Challenge?



Solutions to river flooding must be cost-effective, long-lasting, and compliant with the requirements to secure environmental permits — a tough set of requirements considering:

River "Flood Zone"

- As you can see from the photos above, the Resurrection River isn't just near the airport—the main runway is located within the river's floodway. No engineering solution can permanently change the fact that the runway and the river compete for the same real estate.

River Type — On the Move and Hard to Control

- The Resurrection River is a braided river, meaning that it constantly moves from channel to channel within the floodplain—as the photos above show. Where any braided river will move over time is always a guess, but this is particularly true for the Resurrection River, which carries a lot of natural sediment (gradually clogging existing channels as it settles out) and meltwater (carving new channels during peak seasonal flows). Attempts to control braided rivers provide only short-term benefits, or else require constant maintenance and demand continual funding.

The Resurrection River has caused recurring damage to Seward Airport.

In 2013 alone, the river overtopped the runway 10 times.

Ways to Address the Challenging Hydrology

Raise, Armor, and Reconstruct Runway 13-31	The project will explore ways to better **protect Runway 13-31** (the existing main runway) from flooding by raising the elevation, adding armor protection, and then reconstructing the runway.	See Alternative 1.1 at Station 3
Close Runway 13-31 and Improve Runway 16-34 Instead	The project will explore ways to **improve Runway 16-34** (the existing crosswind runway) in terms of length, width, elevation, and flood protection/armoring. This idea explores closing the main runway to allow floodwater better access to the existing floodplain.	See Alternative 2.2 and Alternative 3.0 at Station 3
Reroute and/or Dredge the Resurrection River	Rerouting the river via dredging or other in-stream options **is not viable.** These types of solutions require continual maintenance, funding, and permitting. Neither a dedicated funding source nor staff to manage the effort are available from DOT&PF.	Not an option

Seward Airport Today

- Runway 13-31 (main runway) 4,249 feet x 100 feet
- Runway 16-34 (crosswind runway) 2,289 feet x 75 feet

The project will focus on solutions to meet **near-term needs** of the current based aircraft PLUS medevac aircraft (King Air B200).

- A minimum runway length of **3,300 feet** will serve the existing based aircraft and medevac operations. (See the highlighted "Current Demand & Medevac" column in the table at right for the other minimum dimensions.)

The project will continue to consider a longer, 4,000-foot runway as a future growth scenario to accommodate the potential demand for commuter aircraft such as the Beech 1900 or the Dash-8.

- See the "Growth Scenario & Emergency Preparedness" column in the table at right for other minimum dimensions.

Challenge: AVIATION DEMAND

Ways to Address the Aviation Demand Challenges

Required Runway Dimensional Standards

(highlighted column notes dimensions to meet aviation demand at Seward Airport)

Feature	Current Based Aircraft Group	Current Demand & Medevac (King Air B200) *Recommended for Near-Term Development*	Growth Scenario & Emergency Preparedness (Beech 1900) *Consider for Long-Term Development*	Dimensions of Existing Main Runway (13-31)
Aircraft Approach Category	A	B	B	B
Aircraft Design Group	I	II	II	II
Runway Length	3,300 feet	3,300 feet	4,000/4,700 feet	4,249 feet
Runway Width	60 feet	75 feet	75 feet	100 feet
Visibility Minimums	1 mile	1 mile	1 mile	1 mile
Crosswind Component	10.5 knots	13 knots	16 knots	13 knots
Runway Safety Area	120 ft x 3,780 ft	150 ft x 3,900 ft	150 ft x 5,300 ft	150 ft x 4,749 ft
Object Free Area	400 ft x 3,780 ft	500 ft x 3,900 ft	500 ft x 5,300 ft	500 ft x 4,749 ft
Runway Protection Zone	1,000 ft x 500 ft x 700 ft	1,000 ft x 500 ft x 700 ft	1,700 ft x 500 ft x 1,010 ft	1,000 ft x 500 ft x 700 ft
Part 77 Primary Surface	500 ft x 3,700 ft	500 ft x 3,700 ft	500 ft x 5,100 ft	500 ft x 4,649 ft
Part 77 Approach Slope	20:1 (visual)	20:1 (visual)	20:1 (visual)	20:1 (visual)

Station #3 shows these dimensional standards as Alternatives.

Alternative 2.2 is the alternative recommended for near-term development. It meets FAA criteria for improvements to meet expected aviation demand.

FAA will support development of the airport to meet Aircraft Approach Category B and Aircraft Design Group II (B-II), which is 3,300 feet long by 75 feet wide, with visual approach capabilities. This standard is consistent with the 2008 Airport Master Plan and approved Airport Layout Plan.

Challenge: AVIATION DEMAND

A facility as large as the existing airport isn't needed to accommodate the expected future aviation activity.

That means funding improvements that rebuild the airport to the existing size may not be possible or practical.

Why is Aviation Demand an Engineering Challenge?

Sometimes what we ***want*** to design/fund differs from what we ***can*** design/fund. Improvement funding is determined by aviation demand. Specific challenges related to aviation demand in Seward include:

The number of operations (landings + takeoffs) at Seward Airport is **low** when compared to other airports statewide.

- The Seward Airport forecast estimates the number of operations will grow as shown below.

Operations	Base Year: 2013	+5 Years		+10 Years		+15 Years	
Local GA	2,000	2,127	2,208	2,260	2,438	2,402	2,693
Itinerant GA	4,000	4,252	4,417	4,520	4,877	4,805	5,387
Medevac	200	213	220	228	243	243	268
Air Taxi/Charter	4,500	4,713	4,969	5,085	5,485	5,406	6,056
TOTALS	10,700	11,375	11,814	12,093	13,043	12,856	14,404

Reference: Seward Airport Improvements, Revised DRAFT Aviation Activity & Facility Requirements, July 13, 2015.

- The number of operations is also low when compared to similar airports.

Airport	Annual Operations (2013)
Seward Airport (SWD)	10,700
Kenai Airport (ENA)	38,950
Homer Airport (HOM)	48,085
Dillingham Airport (DLG)	50,823

Aircraft using the airport now and in the future determine improvements.

- FAA can't fund "build it and they will come" improvements. Engineers must design improvements to serve the existing and forecast aircraft fleet mix based on the design aircraft. Below is the historical fleet mix.

Operator	Aircraft	Airport Approach Category	Airport Design Group	Use
LifeMed	King Air B200	B	II	Medevac
LifeFlight	King Air B200	B	II	Medevac
Guardian	King Air B200	B	II	Medevac
Scenic Mountain Air	Cessna 172	A	I	Flightseeing / air taxi
Seward Air	Super Cub PA-18	A	I	Personal
Private	Cessna 172 Super Cub PA-18	A	I	Personal
Private	Cessna 170	A	I	Personal
Grant Aviation	King Air B200	B	II	Air taxi / charter
Homer Air	Cessna C206/207/209/210 Stationair	A	I	Air taxi / charter
Smokey Bay Air	Cessna C206/207/209/210 Stationair	A	I	Air taxi / charter
Iliamna Air Taxi	Pilatus PC-12	A	II	Air taxi / charter
Island Air Service	Cherokee 6	A	I	Air taxi / charter
Alaska Central Express	Beech 1900	B	II	Air taxi / charter
ERA Aviation	Beech 1900	B	II	Air taxi / charter
Frontier Flying Service	Beech 1900	B	II	Air taxi / charter
Warbelows	Cessna 172	A	I	Air taxi / charter
Wright Air Service	Cessna 208 Caravan	A	II	Air taxi / charter
Other: Operators who requested permission to land in 2013	Lear 35 (11 requests) Gulfstream 5 (16 requests) DC-6	C C B	I III III	
Other: U.S. Coast Guard search and rescue activities and exercises	C-130	C	IV	

Reference: Seward Airport Improvements, Revised DRAFT Aviation Activity & Facility Requirements, July 13, 2015. Data from 2007-2013.

Additional Challenges

FAA design guidance requires the selection of a design aircraft, based on operations, to determine the size of facility that can be funded.

- **The design aircraft is the most demanding aircraft** (or family of aircraft) that REGULARLY uses the airport (now or in the future). The size of this aircraft sets the airport's length, width, and other dimensions.
- "Regular use" is defined as 500 operations (landings + takeoffs) per year.
- The most demanding aircraft (largest wingspan and longest runway length needed) currently using Seward Airport is the **King Air B200**, which is used for medical evacuations. While the annual operations of the medevac airport alone don't meet the FAA threshold of 500, the B200 is a part of the "family" of B-II aircraft serving Seward, which taken together do meet the threshold.
- Larger aircraft such as the C-130 and small charter jets do not fly into or out of Seward Airport often enough to meet the FAA's threshold of **regular** use.
- FAA does not fund public airports to support military operations or aircraft.

"Need to Know" Concepts

Aircraft Approach Category is a letter code (A to E) that classifies aircraft based on the speed at which the aircraft approaches a runway for landing. Category A aircraft approach at a slower speed than Category E aircraft; the higher the approach speed, the longer the runway needed.

Aircraft Design Group is a numerical code (I to VI) that groups aircraft by wingspan size. Group I has the smallest wingspan range, while Group VI aircraft has the widest wingspan range. The wider the wingspan range, the wider the runway needed.

Challenge: FUNDING

Challenge Number One

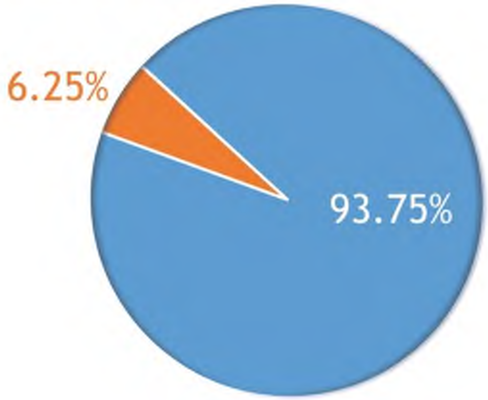
The FAA Airport Improvement Program (AIP) funding is based on a **competitive** scoring system. To receive funding, a project must score well. For the Seward Airport this is a challenge because of:

- The Competition!—Alaska has 249 state-owned airports and 20 municipally owned airports, all seeking funding. Many of these airports are the only means of year-round transportation of people, clothing, food, and fuel for their respective communities.
- Alternative Access—Airports with alternative access such as roads, railroads, and marine vessels do not score as high.
- No other funding source is readily available to DOT&PF. State funding through other sources is not likely in the near term due to Alaska's current fiscal crisis.
- Combining funding sources, although not impossible, proves to be difficult due to timing and commitments of other agencies.

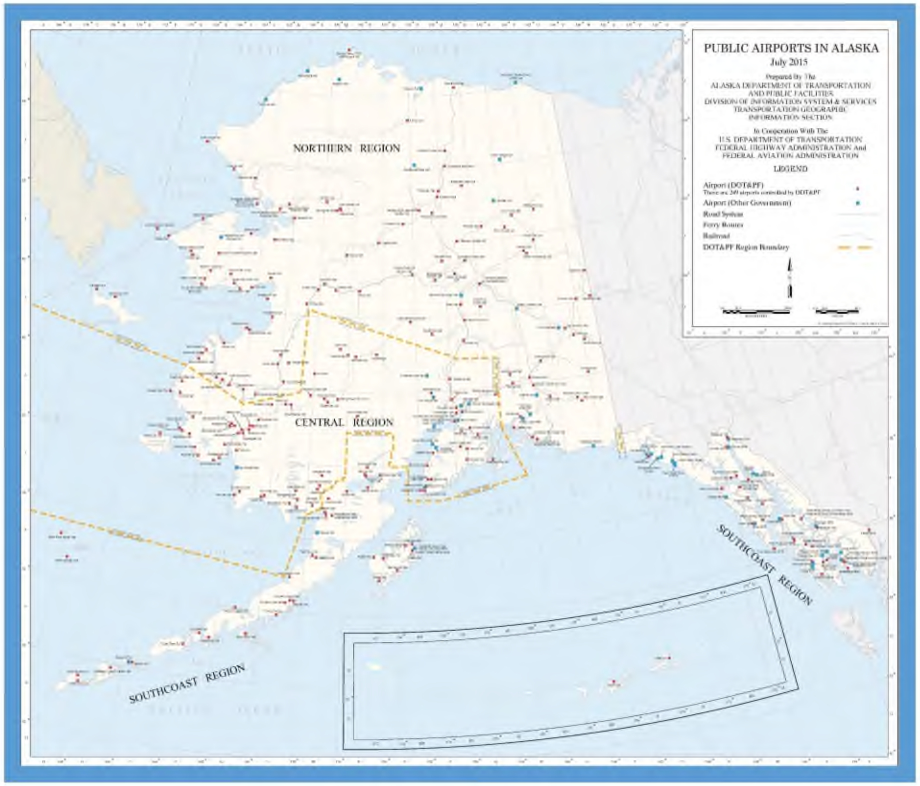
Sources of Funding

***Primary:** FAA Airport Improvement Program*

***Secondary:** State of Alaska funds*



> "Since 2007, economic pressures—including high fuel prices, the financial crisis, and the ensuing recession of 2007-2009—contributed to airline restructuring...general aviation activity, which includes all forms of aviation except commercial and military, has also declined over the last decade. **Because many sources of airport funding, including federal support and locally generated revenue, are tied to aviation activity, for many airports these trends mean less funding available** for infrastructure development."
>
> Statement of Gerald L. Dillingham, Ph.D., Director, Physical Infrastructure Issues
> *Highlights of GAO-14-658T, a testimony before the Subcommittee on Aviation, Committee on Transportation & Infrastructure, House of Representatives*



...And More Challenges...

- The AIP program has about $213 million to spend each year, and this is typically spread over 10 to 15 projects per year.
- The current estimate for the Seward Airport Improvements Project is about $20 million (about 10% of the AIP annual budget).
- Federal/state dollars continue to shrink, while the cost of construction increases.
- Due to budget cuts, future funding is not secure.

The Evaluation Process

Initial Alternatives and Refinement Process

What we've done so far:

01

Collected background data

• • •

Conducted field visit and talked with airport users

• • •

Met with the public

02

Began aviation demand study

• • •

Met with SWG (Seward Airport Working Group: City, Borough, and pilots)

• • •

Completed aviation demand study

• • •

Developed 5 options using current and future use scenarios

• • •

Met with SWG

03

Expanded number of options under consideration to 8 (variations of the initial 5)

• • •

Initiated a hydrologic study

04

Refined alternatives and eliminated some options based on initial hydrologic study results

• • •

Reviewed impacts to adjacent properties and to the environment

05

Completed hydrologic study based on the alternatives most viable for future consideration

• • •

Present challenges and 3 possible solutions

★ WE ARE HERE ★

Today we want to:

Show you the results of this work—our three final alternatives.

Gain additional input on the advantages and disadvantages of these three alternatives.

Evaluation Criteria

What Aspects of the project are most important to you?

COST

- Construction/earthwork cost
- Maintenance and operations (M&O)
- Right of way—preliminary costs only
- Eligibility for FAA funding

SAFETY, ENGINEERING, AND USER CONSIDERATIONS *(not covered by Cost)*

- Wind coverage
- Airspace/Runway Protection Zone (RPZ)/ approach obstructions
- User function/runway reliability/level of service (LOS)
- Long-term stability/risks
- Construction considerations

ABILITY TO SERVE THE COMMUNITY'S NEEDS

- Medevac
- Meets General Aviation (GA) needs
- Search and rescue
- Economic development

ENVIRONMENTAL CONSIDERATIONS

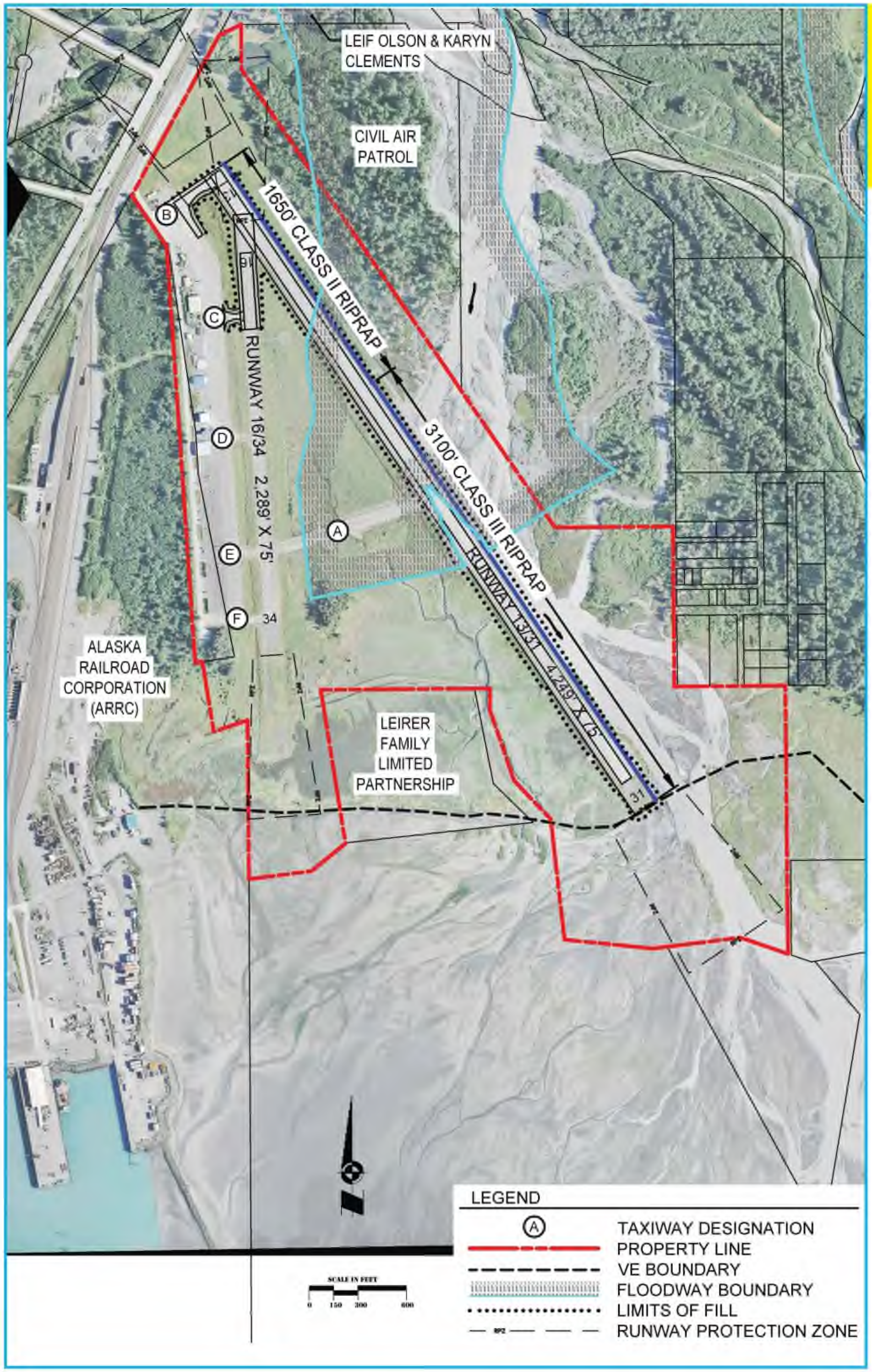
- Floodplain/floodway impacts
- Fish habitat impacts
- Wetlands impacts
- Endangered Species Act (ESA)/bald eagle habitat
- Human (socioeconomic) impacts—right-of-way impacts, compatible land use, etc.

Evaluation Matrix

Alternative Descriptions		*Alternative 1.1*		*Alternative 2.2*		*Alternative 3*	
	Main Runway Disposition	Raise the main runway (maintain existing length and embankment width) - protect from overtopping and protect from erosion		Allow main runway to be overtopped by floodwaters		Allow main runway to be overtopped by floodwaters	
	Crosswind Runway (CW) Disposition	Raise crosswind runway on north to match raised main runway.		Offset CW runway from apron to allow Design Group I aircraft, shift threshold north to avoid VE impacts; widen to 75' (150' safety area) and lengthen to 3300' (3800' safety area)		Offset CW runway from apron to allow Design Group II aircraft, shift alignment to avoid ARRC on south end, shift north to reduce impact in VE zone; widen to 75' (150' safety area) and lengthen to 4000' (4600' safety area)	
	Hydraulic Analysis	Use Q100 with 2-foot freeboard on main runway. This option is within the floodway; consider impacts to properties due to change in the floodway		Use Q100 with 2-foot freeboard on CW, raise CW elevation; provide erosion protection		Use Q100 with 2-foot freeboard on crosswind; raise CW elevation; provide erosion protection, provide protection for the portion in the VE zone	
Evaluation Criteria		*Advantage*	*Disadvantage*	*Advantage*	*Disadvantage*	*Advantage*	*Disadvantage*
Cost							
	Construction/Earthwork Cost - for comparison only -Not total project costs		$13 million		$11 million		$16 million
	Maintenance & Operations (M&O)	Acts as a levee to protect the apron from 100-year flood	More snow removal and pavement surface to maintain than others - assumes the erosion protection is stable/permanent and no additional costs for M&O within the design life. More lighting and pavement markings to maintain.	M&O costs will be less; pavement and lighting for only one runway;new runway embankment acts as a levee to protect the apron from flooding	Maintain closed runway markings; assumes the stabilization is permanent and no additional costs for M&O within the design life	M&O costs less than existing. Only one runway with pavement and lighting to maintain. Embankment acts as a levee to protect the apron from flooding	Similar to Alt 2.2, although slightly more because the longer runway requires additional maintenance due to extra pavement, markings, lights, etc.
	Right of Way –preliminary costs only		$1,300,000		$950,000		$950,000
	FAA Funding Eligibility	Generally easier to get approval of work on existing facility	Two runways may be seen as unwarranted. Environmental impacts could trigger scrutiny of funding	Should be eligible	None	Should be eligible for FAA funding up to 3300' length.	4000' length would require other funding sources to supplement the FAA funding.
Ability to Serve the Community's Needs							
	Medevac	Longest runway - best for jets; also see wind coverage. Allows C-130 access in case of a mass casualty event (very infrequent need).		Serves the King Air 200, provides for basic medevac service	Too short for jets	Longer than Alt 2.2, 4000' length preferable for King Air pilots.	Too short for long-range jets with destinations outside of Alaska
	Meets General Aviation	Improves Runway. Exceeds the forecasted aviation needs.		Improves Runway most often used and adds length. Wider/longer runway accomodates operational tolerance during occasional strong winds.		Improves Runway most often used and adds length. Wider/longer runway accomodates operational tolerance during occasional strong winds.	
	Search and Rescue	Improves Runway		Better Apron Access	Eliminates Longer Runway	Better Apron Access	Shorter than Alternative 1.1
	Economic Development	Longest runway : supports occasional use by Lear jets, tourism opportunities, larger cargo and passenger planes, improves reliability (runway open under a greater range of conditions) and potential for aviation-related business development at the airport including Lear jets and commuter operations	No change to apron area, which limits use of large aircraft on the apron, thus limits business development.	Runway offset provides for larger aircraft (DG II) on the apron taxilane; provides more areas for use by larger aircraft and thus could provide FBO's with greater operational area	Runway too short for Beech 1900 commuter service	Runway offset provides for larger aircraft (DG II) on the apron taxilane, longer runway facilitates use by FBO's including commuter aircraft and some short range jets	
Safety, Engineering & User Considerations (Items not covered by Costs)							
	Wind	Two runways provide slightly better wind coverage for small aircraft. Combined coverage DG II =99.93, DG I = 99.64	Longer runway (13/31) orientation is not as good as the "crosswind" runway. RW 13/31 coverage DG I = 91.1%, DG II = 96.0%	Provides longer/wider runway for best wind coverage orientation; DG I = 98.6% ; DG II = 99.53%. A number of pilots seem to favor improving the cross-wind versus the main runway.	Slightly reduced coverage due to single runway but meets FAA guidelines for a single runway.	Provides longest runway for best wind coverage orientation; DG I = 98.6% ; DG II = 99.53%. A number of pilots seem to favor improving the cross-wind versus the main runway.	Slightly reduced coverage due to single runway but meets FAA guidelines for a single runway.
	Airspace/Runway Protection Zone (RPZ)/Approach Obstructions	**Airspace**: Higher runway, slightly less penetration of airspace	**RPZ**: Main runway has undesirable uses in the RPZ. (Public Road, Railroad) **Approach**: Existing obstructions in the RW 13 approach (road, railroad) would remain. ARRC is planning barge loading/unloading facilities under the approach of RW 34.	**Approach**: Horizontal shift of runway moves the RW 34 approach away from the proposed ARRC development; Closing the main runway significantly reduces RW 13 RPZ obstructions.	RPZ: ARRC development for barge operations (jetty, access road) may occur in RPZ.	**Approach**: Horizontal shift of runway moves the RW 34 approach away from the proposed Alaska Railroad development. Significantly reduces RW 13 RPZ obstructions.	RPZ: ARRC development for barge operations (jetty, access road) may occur in RPZ. RPZ and approach extend into the planned ARRC barge basin.

Large infrequent aircraft, such as Coast Guard C-130 will be unable to use as well as some larger commuter aircraft.	Lengthens the runway along the orientation for prevailing winds; improves apron expansion opportunities; reduces congestion; provides full safety area. Higher (above the flood) runway will improve the reliability of the airport. Shorter taxi path.	Still limits use by infrequent large aircraft, but functions well for based aircraft, medevac, and future commuter aircraft; Single runway provides lower LOS than two runways
Potential risk to downstream (ARRC) facilities if the river moves	Provides flood protecton for apron. Runway is sited further from the river, less potential for flood impacts.	Potential risk to downstream (ARRC) facilities if river moves; is within VE zone and susceptible to tidal influence (greater potential effects from sea level rise).
Construction phasing will be most challenging. If excavation from abandoned runway is used for fill, both runways will be under construction concurrently.	Same as Alt 2.2.	Runway extends out into tidally influenced region. Requires extension of Riprap into the tidal zone. CLOMAR/ LOMAR may be required and could delay construction, but expected to be easier and quicker to obtain than Alt. 1.1. Longer runway is more flexible for construction phasing.

Environmental Considerations							
	Floodplain/Floodway Impacts	Provides flood protection for apron since runway acts a levee. Raises Main RW 2 feet above 100-year flood level.	In the floodway - increases the flood elevation by up to 4', impacts additional private properties. Permitting will face more obstacles due to public process and floodway impacts = expensive and time delays. Impacts the floodway - requires revision to the FIRM map. Process includes public involvement.	Provides flood protection for apron since runway acts a levee. Does not impact the floodway - no change to the FIRM map needed. Eventual breach of main runway would partially remove an obstruction in the floodplain/ floodway.	Greater chance for channel movement into the floodplain when flood waters breach the main runway. In floodplain - increases the flood elevation by <1 foot (with coastal flooding considered); (however based on previous discussions by DOT with FEMA and City 1' rise is okay)	Provides flood protection for apron since runway acts a levee. Eventual breach of main runway would partially remove an obstruction in the floodplain/ floodway. Construction penetrates the VE zone, but is still more likely permittable than Alt 1.1.	Greater chance for channel movement into the floodplain when flood waters breach the main runway. In floodplain - increases the flood elevation by <1 foot (with coastal flooding considered); (however based on previous discussions by DOT with FEMA and City 1' rise is okay). Does not impact floodway but a revision to the FIRM map needed to change the limits of the VE zone.
	Fish Habitat Impacts	Least impact to intertidal (coastal) EFH area for salmon and marine fish species	Requires in water work to place erosion protection; most impacts to Resurrection River mainstream, which is EFH for salmon species	Fewer impacts to intertidal EFH than Alt 3. No impacts to Resurrection River than Alt 1.1.	More impacts to intertidal EFH than Alt 1.1.	In instream impacts to the Resurrection River	Greatest impacts to intertidal EFH; but is not within marine habit.
	Wetlands Impacts	No wetlands fill associated with RW 16-34	Most impacts to wetlands from fill in River to raise RW 13-31. May be difficult to permit because Clean Water Actequires selection of practicable alternative with least impacts.	Most permittable. Fewer acres of impacts than Alt 1.1.	Similar wetland impacts to Alt 3,but less due to shorter RW).	Fewer acres of impacts than Alt 1.1.	Similar wetland impacts to Alt 2.2 but more due to longer runway. Fill for longer RW would be harder to justify.
	Endangered Species Act (ESA)/Bald Eagle	Farthest from Resurrection Bay where sea lions, otters and harbor seals are known to be located. Most acceptable under ESA and MMPA	Possible bald eagle nest impacts (based on 2004 nest sites), more so than with other alternatives	Similar distance from Resurrection Bay as Alt 3. Less fill near or in the bay than Alt 3.	Fill in/near Resurrection Bay and possible bald eagle nest impacts	Similar distance from Resurrection Bay as Alt 2.2.	Least acceptable under ESA and MMPA. More fill than Alt 2.2 in/near Resurrection Bay.
	Human (Socioeconomic) Impacts (ROW Impacts, Compatiable Land Use)	Greater reliability of main RW and keeping both runways provides increased capacity, higher LOS. This option would provide additional protection for the ARRC facilities	Flood plain impacts would impact more private properties adjacent to River and the affect their property values; portions of the impacted property are undeveloped and the properties lack access.	Flooding affects reduced therefore less property impacts during Q100. Longer RW 16-34, but not as long as in Alt 3.	Loss of main RW and short length of RW 16-34 less favorable to the City from Economic development potential standpoint. Restricts access to floatplane takeout area.	Longer RW 16-34 than Alt 2.2; provides oppuntity for larger aircraft	Loss of main RW. Restricts access to floatplane takeout area.



ALTERNATIVE 1.1

Reconstruct Existing Main Runway (13-31) (4,249 feet x 75 feet)

- Reconstruct and raise Runway 13-31 above the 100-year flood level. Install riprap to protect the embankment.
- Adjust elevations of Runway 16-34 and Taxiways B and C to match new runway elevation. Eliminate Taxiways A, D, and E to comply with new FAA guidance.

Key Advantage

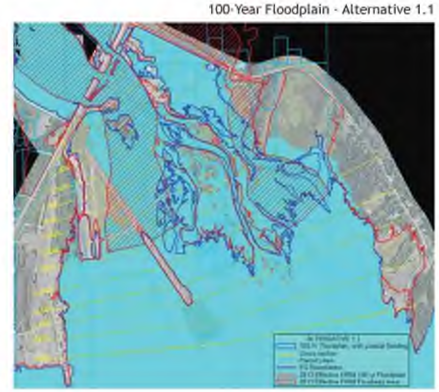
+ Runway will still accommodate historical jet traffic, although it will be slightly shorter to provide the full required Runway Safety Area.

Key Disadvantages

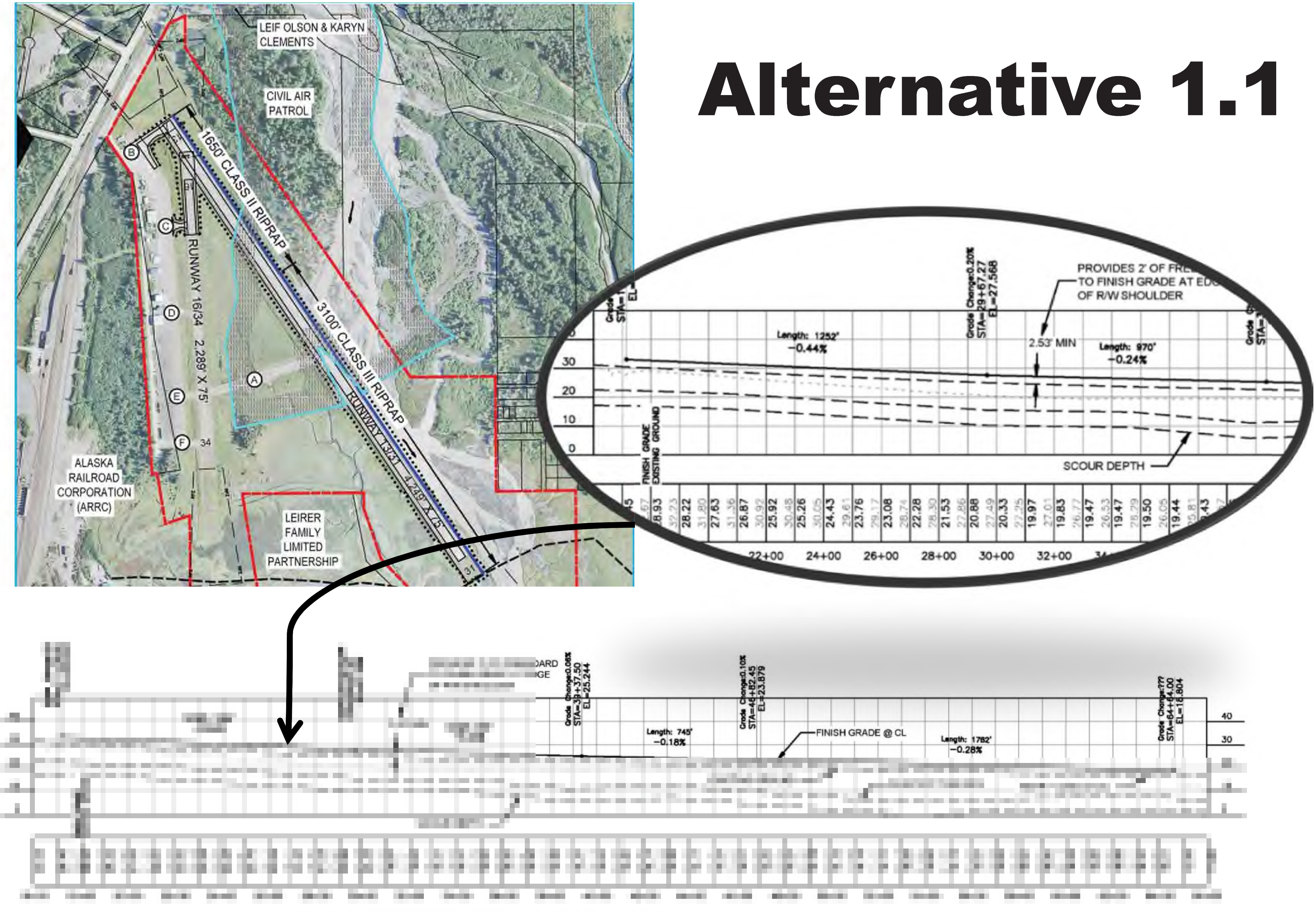
- Creates the greatest flood impacts.
  - Requires armoring and raising the runway by 4 feet on average.
  - The higher runway will redirect more flood water further to the other side of the river, impacting more properties than the other alternatives, thereby lengthening the property acquisition phase.
  - Impacts the Resurrection River floodway, requiring a revision of the FIRM (flood) map. May not be achievable due to the additional impacts to river properties. Requires a public process. The FIRM revision is expected to lengthen the permitting process by about 2 years.
- Most difficult option to permit and construct due to the work required in the river.
- Offset from the apron remains substandard for large aircraft.

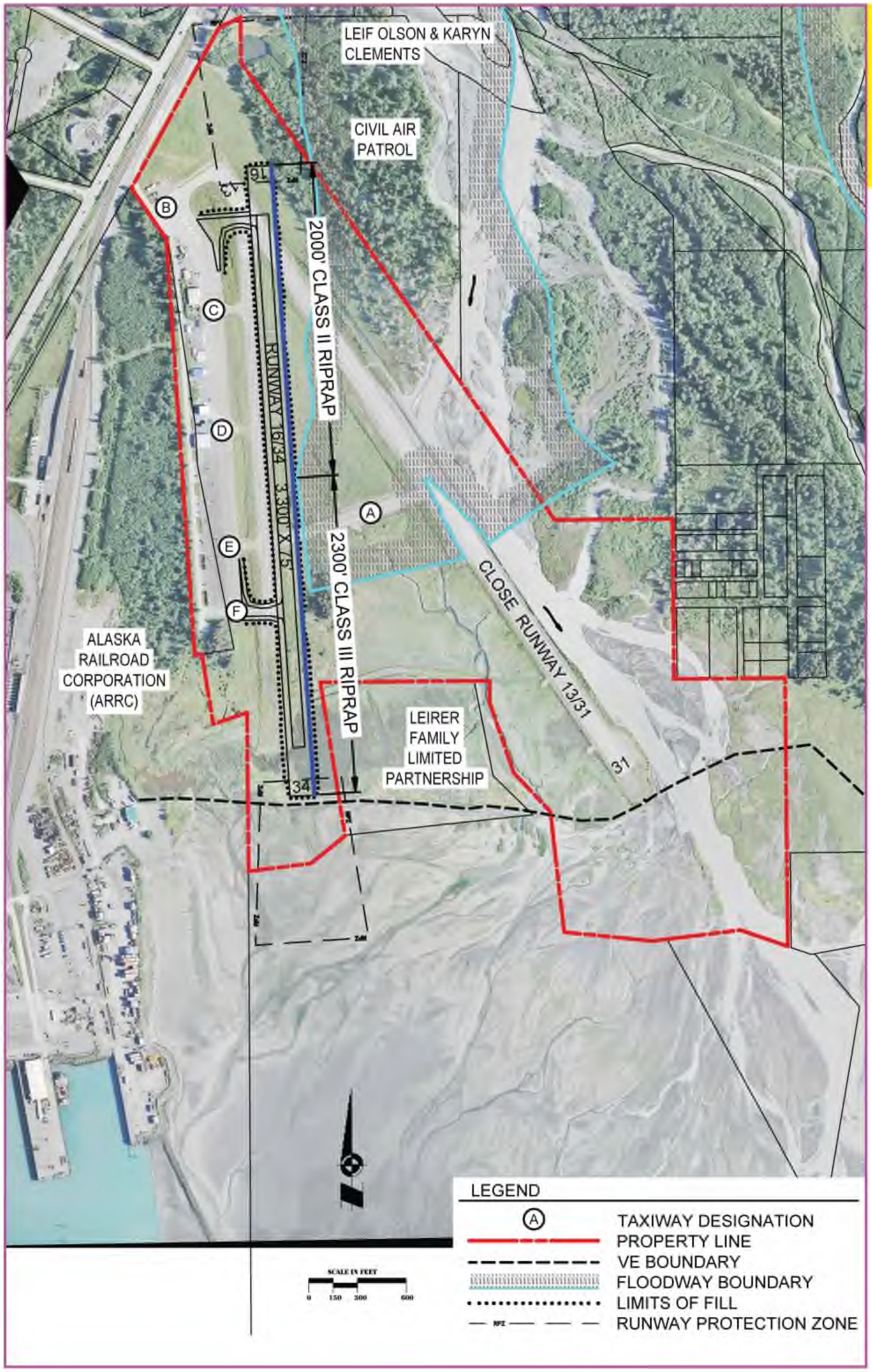
100-Year Floodplain - Existing Conditions

100-Year Floodplain - Alternative 1.1



Alternative 1.1





ALTERNATIVE 2.2

Shift Existing Crosswind Runway (16-34) East & Add 1,011 Feet (3,300 feet x 75 feet)

- Close Runway 13-31 and allow floodwater to overtop it.
- Reconstruct and raise Runway 16-34 above the 100-year flood level. Install riprap to protect the embankment.
- Relocate Taxiway B and adjust Taxiway F to match new runway elevation. Eliminate Taxiways A, C, D, and E to comply with new FAA guidance.

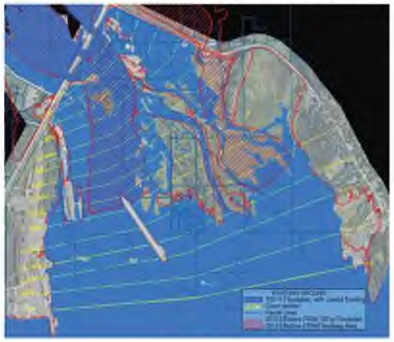
Key Advantages

+ Sufficient for current and predicted aircraft demand. Accommodates the design aircraft.
+ Less susceptible to flood damage than Alternative 1.1, since improvements are located further away from the river threat.
+ Lengthens the runway that is best aligned with the predominant wind direction.
+ Increases the runway offset from the apron to allow larger aircraft to use the apron.
+ Has the least environmental and flood impacts of all alternatives. Impacts the floodplain but not the floodway.
+ Raises the 100-year flood level by less than 1 foot, resulting in minor additional flood impacts to river properties. Fewer properties to be acquired than Alternative 1.1, and consequently, a shorter property acquisition process.
+ Could be phased to extend to a longer runway as future demand warrants.
+ Easiest option to construct.

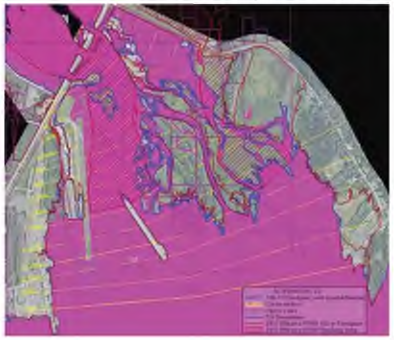
Key Disadvantages

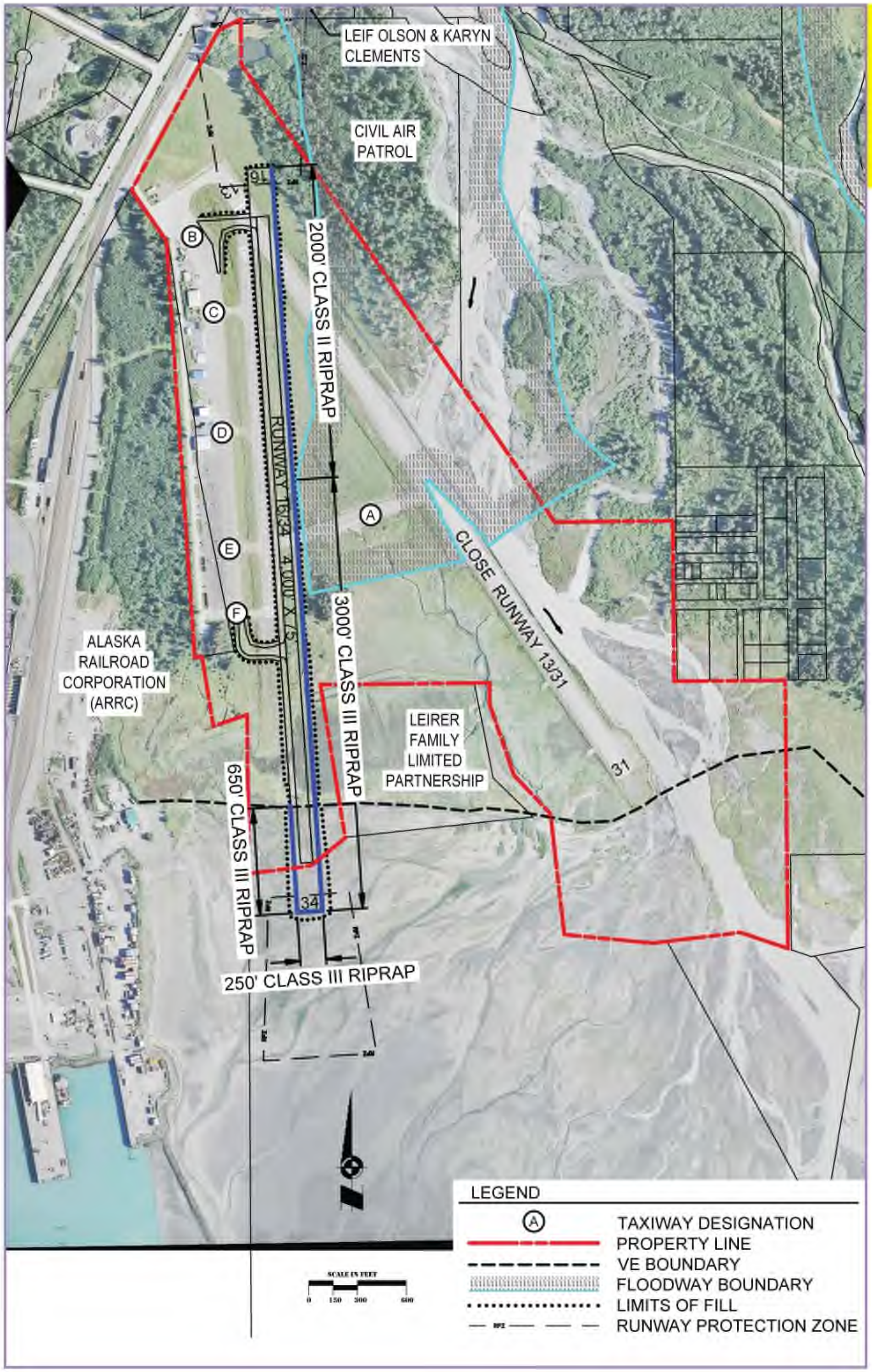
- One runway (13-31) would be eliminated.
- The new, improved Runway 16-34 would be 949 feet shorter than the abandoned runway.

100-Year Floodplain - Existing Conditions



100-Year Floodplain - Alternative 2.2





ALTERNATIVE 3.0

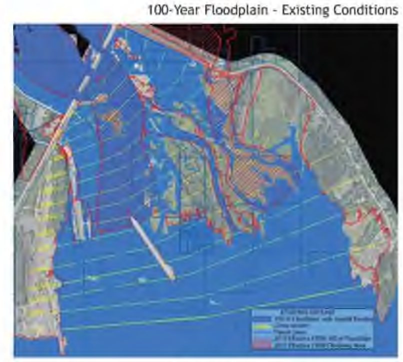
Shift Existing Crosswind Runway 16-34 East & Extend by 1,711 Feet (4,000 feet x 75 feet)

- Close Runway 13-31 and allow floodwater to overtop it
- Reconstruct and raise Runway 16-34 above the 100-year flood level. Install riprap to protect the embankment.
- Relocate Taxiway B and adjust Taxiway F to match new runway elevation. Eliminate Taxiways A, C, D, and E to comply with new FAA guidance.

Key Advantages

+ Less susceptible to flood damage than Alternative 1.1, since improvements are located further away from the river threat.
+ Is longer than Alternative 2.2, which allows for use by commuter aircraft such as the Dash-8.
+ Lengthens the runway that is best aligned with the predominant wind direction.
+ Increases the runway offset from the apron to allow larger aircraft to use the apron.
+ Raises the 100-year flood level by less than 1 foot, resulting in minor additional flood impacts to river properties. Fewer properties to be acquired than Alternative 1.1, and consequently, a shorter property acquisition process.

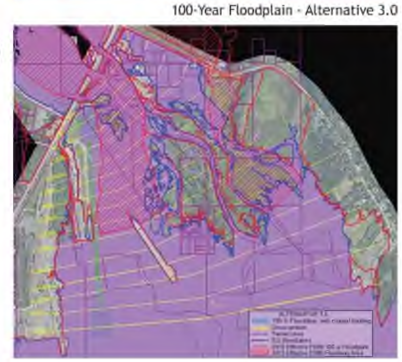
100-Year Floodplain - Existing Conditions



Key Disadvantages

- Requires an alternative funding source. The additional 700 feet of runway length do not qualify for federal funding.
- Impacts the Velocity Zone (tidelands) on the FIRM (flood) map, requiring a revision to the FIRM map. Necessitates additional engineering to provide protection against the Resurrection Bay flood impacts.
- May take longer to obtain permits than for Alternative 2.2 due to tideland impacts, but shorter time than Alternative 1.1.

100-Year Floodplain - Alternative 3.0



MEMORANDUM

Date: May 1, 2016

To: Barbara Beaton, DOT&PF Project Manager

From: Robin Reich and Carla SlatonBarker(Solstice Alaska Consulting) with input and review from Angela Smith and Royce Conlon (PDC)

Subject: Summary of 04/20/2016Stakeholder Working Group Meeting #3 – Seward Airport Improvements Project (#Z548570000)

This document provides a summary of the third Stakeholder Working Group (SWG) meeting held on April 20, 2016, for the Seward Airport Improvements Project. This SWG meeting was held in Seward at the K.M. Rae Marine Education Building in advance of an evening public meeting. The SWG meeting began at 1:30 pm and ended at approximately 3:45pm. Table 1 lists the meeting attendees.

Table 1. Meeting Attendees

SWG Membership	Name
Alaska Railroad Corporation (ARRC)	Jim Kubitz, Christina Hendrickson, and Rene Murphy (a consultant employee under contract on ARRC master plan project)
City of Seward: Seward City Council	Christy Terry(Ms. Terry is also no longer a member of the City Council, but she has been asked by the mayor to remain on the SWG. She is an employee of the ARRC.)
City of Seward: Assistant City Manager/Community Development	Ron Long
Civil Air Patrol	Not in attendance
Federal Aviation Administration (FAA)	Mike Edelmann (participated by phone)
Kenai Peninsula Borough (KPB) Seward/Bear Creek Flood Service Area, Water Resource Manager	Dan Mahalak
Lease Holder, General Aviation (GA) Pilot, Community Member	Not in attendance
Alaska Department of Transportation and Public Facilities (DOT&PF) Maintenance	Not in attendance
DOT&PF Project Management, Central Region Design and Engineering	Barbara Beaton, P.E., Project Manager
DOT&PF Hydrologist	Paul Janke, Hydrologist
Consultant: PDC Inc. Engineers	Royce Conlon,P.E., Consultant Team Project Manager and Angela Smith, P.E., Project Engineer
Consultant: Hydraulic Mapping and Modeling	Ken Karle, P.E., Hydrologist
Consultant: Solstice Alaska Consulting, Inc.	Robin Reich and Carla SlatonBarker

Meeting materials distributed in advance of the meeting included the meeting agenda; final "Forecast of Aviation Activity & Facility Requirements" technical (tech) memorandum (memo);draft "Location Study/Alternatives Analysis" tech memo; and the meeting notes from the July 21, 2015 SWG Meeting #2. These items were distributed via email (basecamp file-share link and as an attachment) on Monday, April 18, 2016. A PowerPoint presentation (attached) supported the meeting agenda. Figure 1 presents the meeting agenda. The agenda documents the meeting's objectives, goals, and format.

Figure 1. SWG Meeting #3 Agenda and Overview

SWG Meeting #3 Agenda and Overview

Meeting Objectives (Our Work Today)

- Review where we are in the process.
- Present the results of the Hydrology Report.
- Present alternatives developed to solve identified issues and needs.
- Present the advantages and disadvantages associated with each alternative.
- Gather input from SWG members on alternatives and their advantages and disadvantages.
- Gather input from SWG members on how to evaluate alternatives.

Meeting Goals (Meeting's End Result)

- Shared understanding of the alternatives and their advantages and disadvantages.
- Shared understanding of the evaluation process and criteria that are important for ranking alternatives.
- Shared understanding of the project process, including next steps.

Meeting Agenda (Topic and Timeline)

- **Introductions and Purpose of the Meeting**
  (Robin Reich, Solstice Alaska Consulting) (1:30-1:40 am)
- **Welcome** (Barbara Beaton, P.E., DOT&PF) (1:40-1:45 pm)
- **Recap of the Project and its Challenges**
  - Hydrology: Discussion of the Hydrology Report
  - Aviation Demand: Recap of Aviation Demand Report
  - Funding

  (Royce Conlon P.E., PDC Inc. Engineers) (1:45-2:00 pm)
- **Evaluation Process**
  - Presentation and discussion of draft criteria for evaluating alternatives.

  (Royce Conlon) (2:00-2:15 pm)
- **Project Alternatives with Advantages and Disadvantages**
  - Range of alternatives considered and viable alternatives
  - Advantages and disadvantages of alternatives.
  - SWG member comment.

  (Royce Conlon P.E., PDC Inc. Engineers) (2:15 pm-3:15 pm, with break as needed)
- **Status on Other Project Activities and Next Steps**
  (Royce Conlon) (3:15-3:30 pm)
- **Adjourn** (3:30 pm)

Pre-meeting packet: final "Aviation Activity and Facility Requirements" report, draft "Alternatives Analysis" report, SWG meeting #2 notes

Thank you for your time and participation!

Introductions and Purpose

Robin Reich, Solstice Alaska Consulting, began the meeting with a welcome and introductions. She reminded participants that this was the third meeting of the SWG: the second meeting was held in July 2015 and the first was held in November 2014. She articulated the purpose of SWG meeting #3: to review the project process, including the results of the hydrology study, the finalized "Aviation Demand and Facility Requirements" tech memo, and the draft "Location Study/Alternatives Analysis" tech memo. She noted that the primary focus of the meeting was to discuss project alternatives in context with aviation demand, facility requirements, and hydrology information, and to gather input from SWG members on advantages and disadvantages of alternatives.

Welcome

Barbara Beaton, DOT&PF, provided an opening statement. She noted that the design team has been working hard on the project, and that the focus of the meeting is to bring the team's work to the SWG and solicit comment. She explained that the team prepared the design and engineering information in two formats: the first format is the typical report format of the tech memos (these include the engineering details), and the second format presents the information in a more user-friendly way. She noted that the user-friendly format captures highlights and forms the content of the public meeting display boards and SWG meeting presentation slides. Ms. Beaton next introduced Royce Conlon, PDC Engineers, to lead the presentation and the discussion.

Recap of the Project

The following sections refer to the SWG meeting presentation slides, attached to this report.

Royce Conlon, PDC, provided a recap of the project by reintroducing the firms contracted by DOT&PF to work on the project (SWG presentation, slide 3). Next she provided an overview of the project process (SWG presentation, slide 4). She explained that the team was following a federal and state process to identify the alternatives to carry forward. She explained that the outcome of this current "project scoping" phase will be the identification of alternatives that will be advanced for further study in the environmental document. She noted that an important aspect of this phase is determining if only one build alternative and one no-build alternative advances, or if the project will identify more than one build alternative to advance with the no-build alternative. She noted that this discussion was next in the process.

Recap of the Project's Challenges

Ms. Conlon next provided a summary of the project's top challenges: hydrology, aviation demand, and funding (SWG presentation, slide 5). She explained that these challenges are important to understand because they inform what can be done (project solutions). She reiterated that the challenges the team is presenting today, as well as the alternatives, are not new to the SWG—they have been topics of the other two SWG meetings. She did note, however, that the public will be seeing this information for the first time at the public meeting later in the day. She noted that the SWG presentation slides are built from the display boards so the slides have text too small to read. It was noted that intention was not for SWG members to read this information now; Ms. Conlon explained she would verbally provide highlights of the information on the slides. SWG members were encouraged to read all the information presented on the display boards after the SWG meeting or at the public meeting.

Ms. Conlon explained that the bulk of the SWG discussion for this meeting would focus on alternatives and their advantages and disadvantages, but that the team wanted to present the top three challenges to the SWG in the lay-person format as a reminder of the issues. The presentation slides are attached and contain the information presented at the meeting. Below are key points of the "challenges" presentation:

Challenge: Hydrology (SWG presentation, slide 6):

- See the attached SWG presentation for information presented.

Challenge: Aviation Demand (SWG presentation, slides 7 & 8)

- See the attached SWG presentation for information presented.

SWG Questions/Comments related to Hydrology and Aviation Demand Challenges

Question: Ron Long (City of Seward) posed a ***question related to the data used*** to determine the current and forecast aviation demand, as well as the facility requirements. He noted that the Seward Airport has had reduced capacity for the last three years. He asked if this reduced capacity was factored into the aviation demand study. Specifically, he asked whether the qualifying period of study used data from 2012, after the restrictions reduced the number of operations.

> **Answer:** Ms. Conlon noted that the 2008 Master Plan recommended the same design aircraft. She also noted that the SWG asked for a longer study period during the SWG review of the draft "Aviation Demand and Facility Requirements" tech memo, and the team incorporated this feedback. She said that the planning period used to determine operations went back further than 2012.
>
> - ***Post Meeting Follow-Up:*** To prepare the final "Aviation Demand and Facility Requirements" tech memo, the team reviewed FAA guidance and confirmed that historical data does not have the same weight when developing a forecast [for example the EAS program impacted historical numbers, but this program is not active and is not anticipated to be active in the near term]. This information was is included in Table 5 and Table 6 of the final "Aviation Activity & Facility Requirement" tech memo for historical context.

Question: Mr. Kubitz asked for a ***definition of an operation***. What is the definition of "landing" in terms of an operation, and related to the 500 operation threshold?

> **Answer:** Ms. Conlon said landing is one operation; a takeoff is one operation; a landing and a takeoff together count as two operations.

Comment: Dan Mahalak noted that the Seward Airport receives about five jets a summer. He said that this is a low number (when compared to the FAA threshold of 500 operations), but these five jets provide a big boost to some local economies. He raised the concern about alternatives that provide only a short runway, and ***commented that a short runway will significantly impact the "local economies" who depend on these jet landings.***

> **Response:** Ms. Conlon confirmed that Alternative 2.2 is a 3,300-foot runway, and this runway would not support fully loaded jet landings. She noted that Alternative 2.2 would be developed to

not preclude a longer runway in the future, when demand warrants a longer runway to accommodate jets. She explained that Alternative 3.0 features a 4,000-foot runway, which is considered the "long-term" or "growth" scenario. Ms. Conlon noted that FAA funding would not support the construction of Alternative 3.0 at this time.

Question: Are ***"rotor ops" (helicopter operations) counted***?

Answer: Ms. Conlon said only fixed-wing operations are counted/used in the aviation demand and facility requirements memo. Helicopters do not use the runway in the same manner; however, the alternative(s) selected for this project would not preclude helicopter operations.

Question: What about counts of C-130 operations, used by the Coast Guard? ***Aren't C-130 operations factored into the project and part of the justification for facility requirements?*** (*With humor*: What about counts for the Osprey helicopter [used in advance of and during President Obama's visit]).

Answer: FAA funds cannot be used to fund operations for other branches of government. Also, the 500 operation threshold applies, and the Osprey visits likely amounted to about 20 operations, so a "few" more would be needed.

The group's ***comments indicated a desire for the project to fund improvements that would provide for a runway capable of serving jets.*** Ms. Conlon reiterated her understanding that no one wants to lose what they have, but on the other side it takes funds to maintain a larger facility, and "that's where the rubber hits the road." The aviation demand and number of operations indicate strongly that at this time this type of facility will not be supported through FAA funding. Mike Edelmann (FAA) confirmed Ms. Conlon's statement.

<u>Challenge: Funding (SWG presentation, slide 9)</u>

Ms. Conlon highlighted the following information from this slide: 218 airports compete for Airport Improvement Program (AIP) funding in Alaska; of these, about 20 airports usually get funding from the program; AIP funds have not grown over the years, but the cost of constructing airport improvements has and will continue to grow (the money is not going as far as it used to); this is a competitive process (Projects rank higher if they have local or in-kind money to help; projects rank higher if they are off the road system, such as in Rural Alaska, where they depend on the airport for transport of food, fuel, medical supplies, etc.).

SWG Questions/Comments related to Funding Challenges

Question/Comment: Christy Terry, City of Seward, asked if the ***AIP process and evaluation consider the impact of an avalanche.*** Although Seward is on the road system, avalanches can block road access. Avalanches have blocked the road, and on one occasion for five days. This situation and the impact should be considered—it effects whether Seward stores have groceries and whether or not there is access in the case of a medical or another emergency.

Answer: Ms. Beaton, Ms. Conlon, and Ms. Smith together responded to this question, noting that one way of looking at this is that the avalanche's impact is temporary, so Seward would not score as high as would a rural village with no other alternative access. On the flip side, Seward Airport may score higher on this issue than, an airport on the road system but with no avalanche potential, such as Birchwood Airport, because an avalanche could limit road access to Seward and this is not the case for Birchwood.

Question: Ron Long, City of Seward, asked for clarification of the statement that projects with a local match score higher. He noted that originally $17 million was "earmarked" for Seward Airport improvements. He asked: ***did the earmarked $17 million go to the Seward Airport Project or did it go into the AIP and to other projects?*** "Is there any fidelity at all with the original intent," he asked?

> **Answer:** Ms. Beaton said that the funds are in the AIP program, but not earmarked for the Seward Airport. The obligation of AIP funds for each airport, including the Seward Airport is a negotiation between the DOT&PF and FAA. DOT&PF is now trying to determine which alternative to bring forward into the design phase, so the design package can be developed in time to receive those funds for construction (currently 2018). Ms. Beaton asked if Mr. Long had or could acquire a local match to the FAA funding for project improvements, and Mr. Long responded that at this time the City of Seward has no in-kind match.

Alternatives Evaluation Process <u>(SWG presentation, slides 10-12)</u>

Next, Ms. Conlon turned the group's attention to the evaluation process, as a precursor to the presentation of draft alternatives. She noted that the team would like to solicit SWG input on the following criteria that the team has used to evaluate alternatives: Cost; Ability to Serve the Community's Needs; Safety, Engineering, and User Considerations; and Environmental Considerations (see SWG presentation slide 11). She noted that it is a tall order to balance these elements and keep them all in play. She explained that the Evaluation Matrix (included in the draft "Alternatives Analysis" tech memo and represented by slide 12 of the presentation) represents the project team's evaluation process, which has resulted in the three alternatives presented today. She asked for SWG thoughts on this topic, and the following thoughts were voiced:

The group's ***discussion centered on the need for high weighting of socioeconomic criteria.*** The following comments capture the highlights of the discussion.

Jim Kubitz (ARRC) noted the importance of ***strongly considering (and giving a high rank to) economic development, particularly the relationship between economic development and the airport's support of scheduled air service.*** He noted that ARRC is interested in having scheduled air service to Seward for use in transporting ARRC crews. He said that the ARRC's vision for an airport that serves this need/supports this economic activity is part of their planning process, and he noted that this plan does not jive well with FAA's methodology for evaluating and identifying facility requirements (particularly the requirement of 500 jet aircraft operations to justify a longer runway). ARRC's economic development/planning process and FAA's airport planning process seem at odds. Ms. Conlon noted that it is not FAA requirements that are the barrier to a longer runway; it is the lack of future demand—the lack of intent by air carriers to provide scheduled service. She explained that the project team spoke with Ravn (formerly Era), and the team asked what it would take for them to provide scheduled service. She reported that Ravn told the team that it would take a reliable approach and passenger demand for them to consider scheduled air service to/from Seward. Ravn said that it is not economical for them to have scheduled service to/from Seward without a reliable approach because people can just jump in their cars to travel to Seward. Ms. Conlon then explained that the team (with SWG member Dennis Perry) discussed with FAA the idea of a new approach and learned that FAA did not support a public approach due to the surrounding terrain. The reality is that the weather is low in Seward. She said that the team discussed a Seward approach with FAA in terms of "how low can we go" and in terms of an approach that Dennis Perry has used. FAA acknowledges that pilots can be trained on special approaches (such as the special approach for the Juneau Airport) but FAA communicated that these approaches cannot be public approaches. These special approaches require special equipment in airplanes, and specialized equipment on the ground to assist pilots in marking when they are over certain spots or landmarks. The reality is that certifying a new approach is slim. Mr. Long (City of Seward) noted that the issue is really about economics—can the air carrier make this route economically viable. He explained that the Essential Air Service contract in the past made the scheduled service viable—the program subsidized the air carriers, so canceled flights due to weather did not impact the viability of the route. This program is no longer active.

- ***Post Meeting Follow-up:*** The airline decided to discontinue flying to Seward due to a lack of demand and requested to be released from their contract. The release was granted. Attachment 6 to the final "Forecast of Aviation Activity & Facility Requirements" tech memo includes a summary of the conversation with the FAA on this topic (2/6/2015).

Christina Hendrickson (ARRC) noted that the team working on the Seward Marine Terminal Expansion Plan ***have "hard" weights related to safety and socioeconomic development.*** The ARRC has data and analysis that could be used to strengthen any socioeconomic discussions or justifications. When asked, Ms. Hendrickson noted that the ARRC projects have not evaluated the airport as a specific economic driver for ARRC or for port planning purposes.

Mr. Long expressed that it is ***imperative that we maintain the 4,000-foot runway option or at least the capacity for this.*** He said that "every breath in my body wants to build it today," but he noted that he understands why it cannot be built now. Ms. Conlon reiterated that the near-term solution would be a 3,300-foot runway, and the long-term solution would be a 4,000-foot runway. She explained that in airport planning "near-term and long-term" no longer refer to years; instead the terms now relate to "thresholds" of use. In this case, the long-term solution gets triggered in terms of 500 operations.

Mr. Mahalak (KPB) expressed ***the need to consider impacts to existing facilities such as current hangars, particularly for alternatives that raise the elevation of the runway.*** Ms. Conlon explained that the apron elevation would not change; this was part of the reason for the offset of the proposed runway centerline as compared to the existing.

Project Alternatives: Advantages and Disadvantages

Ms. Conlon noted the focus of the rest of the meeting: to collect input on alternatives, as well as their advantages and disadvantages. Slides 13-16 present the alternatives, with their advantages and disadvantages. Comment highlights are noted below.

SWG Questions/Comments Related to Alternative 1.1

- Ms. Hendrickson (ARRC) asked about ***river impacts to Lee's property in the northwest. She noted that important ARRC infrastructure is located there, and she registered concern that this alternative would have negative impacts to ARRC facilities.*** She noted that on this first review, Alternative 1.1 seems the least desirable alternative from the ARRC's perspective.
- Mr. Long (City of Seward) asked about the ***properties (unoccupied or occupied)*** to the east that would be flooded. Ms. Beaton responded that some properties are described as having improvements in the Borough's property database. She also noted that there is a Native allotment in this area. She said that property acquisitions for Native allotments are lengthy processes.

- Mr. Mahalak (KPB) asked about the ***cost of this alternative and the costs across all alternatives.*** Ms. Conlon responded that the costs shown on the matrix are only earthwork costs. The earthwork cost of Alternative 1.1 is about $17 million.
- Mr. Mahalak (KPB) asked about the ***runway protection zone (RPZ) land use regulations, and commented on recent approach "near-misses" related to cranes in the RPZ***. He noted that any changes or enforcement will be of interest to land owners. Ms. Conlon responded that there are additional regulations for newly constructed RPZs that are not enforced within existing RPZs.
- Mr. Long asked about the ***status of the DOT&PF's evaluation of the main runway's strength.*** He suggested that this test occur periodically, in different conditions and times of year. Ms. Beaton responded that the last test occurred two years ago, and that there is a plan to retest again next month (May).

SWG Questions/Comments Related to Alternative 2.2

- Members representing the ARRC expressed a need to ***understand better the three-dimensional space related to the RPZ and other airspace boundaries to the north and the south.*** They voiced concern related to ARRC's planned infrastructure development.
- Mr. Mahalak (KPB) noted that ***this alternative moves the runway closer to the Olsen property. This is the location of near-misses related to crane use on the property.***
- The group ***discussed the RPZ and actions that might be needed to protect the RPZs or actions to protect approaches.***
- A member asked for clarification related to the additional runway length—to the north or to the south? Ms. Conlon explained that the extension would be to the south—out into the Velocity Zone (VE) (coastal erosion zone or tidelands). Mr. Long (City of Seward) asked if this ***improvement into the coastal zone*** is feasible. Ms. Conlon responded that the improvement would result in less than a 1-foot flood rise, which is considered an action that could be permitted. Ms. Beaton also responded that the feasibility of constructing within the VE zone had been discussed with the department's Coastal Section. Designing protection against the design wave will be a simple process as the design wave is much smaller than in other areas of the state.
- Mr. Long (City of Seward) asked if there would be ***property acquisitions related to floodplain impacts***. Ms. Conlon/Ms. Beaton answered that further floodplain and right-of-way impact assessments would be needed—at this point, floodplain impacts from Alternative 2.2 look similar to the existing floodplain condition. Acquisition will be needed for Alternative 1.1 as it causes significant changes to the existing flood conditions for private parcels in and across the river.
- Mr. Mahalak commented that ***Alternative 1.1 looked to result in a 4-foot surface water rise. He commented that 1 foot or less of surface water rise is much more able to be permitted.***

SWG Questions/Comments Related to Alternative 3.0

- Mr. Mahalak (KPB) ***cautioned against waiting too long to explore this alternative***. He noted that Alternative 3.0 might be precluded if the pending revised FIRM maps become effective. He also noted that Alternative 3.0 is in the coastal zone, and while coastal engineers say this alternative will be "okay" this is not necessarily what the regulatory process will allow. He ***offered to share the GIS layers for the new FIRM boundaries,*** and ***suggested strongly that the***

project incorporate this FIRM boundary information relative to the project strategy of a near-term and long-term solution.

> ***Post Meeting Follow Up:*** Designing into the VE zone was discussed with a FEMA representative and the State's Flood Manager. According to them, moving through the public process required to revise the FIRM map, to relocate the VE Zone boundary, will likely be easier than trying to revise the floodway boundary on the FIRM map. Changes to the VE zone boundary are not anticipated to impact private properties**.**

- Mr. Janke (DOT&PF Hydrologist) added to this comment, noting ***that the VE zone could move farther north, which could affect Alternative 2.2 and Alternative 3.0 differently.***

  > ***Post Meeting Follow Up:*** The VE boundaries from the draft FIRM map are shown on the current alternative drawings.

- Mr. Kubitz (ARRC) asked about ***property acquisitions from the Department of Natural Resources*** (DNR) related to Alternative 3.0. Ms. Beaton responded that there would be property acquisition, but this would be a much quicker process between the two state agencies.

SWG comment pertaining to all alternatives

- ***There is an unlighted crane on the Olsen property that is a hazard.*** Suggestion that DOT&PF acquire the property or an airspace easement to remedy the situation.
- ARRC representatives asked: **W*hat flooding and sedimentation impacts are anticipated as a result of the relocated runway (Alternative 2.2 or 3) and by allowing Runway 13/31 to breach, particularly related to proposed ARRC development downstream of the airport***? Mr. Janke, DOT&PF hydrologist, noted that this cannot be answered now because he does not know what development the ARRC is considering.

Open Discussion

Ms. Conlon ended the presentation with a request for open comments on the topic of "what are we missing," or "what do you like or don't you like"? The following record SWG comments:

Mr. Long (City of Seward) expressed that the team has done a good job with what they have been tasked with. He recognizes the resource constraints, so he sees that the answer is not Alternative 1.1. The next most desirable option is to serve the community's needs today and then tomorrow. He noted that he ***likes Alternative 2.2 with the ability to add on, at least as much as anything.*** He said this option is better than the no-build alternative. He expressed that letting the main runway go, however, is problematic—there is ***value in protecting one's investment, particularly if the river were to shift again in the future away from the airport.***

Mr. Mahalak (KPB) offered the following comments:

- The project should drive the design by sound engineering practices and not by trying to escape regulations. Regulations can be overcome. He said that in ***his experience the time and financial cost to obtain a conditional letter of map revision (CLOMR) from FEMA would be about two years and $240,000. He noted that obtaining a CLOMR is required prior to any construction that requires modifying a FEMA flood insurance rate map.***
- One significant issue with both Alternatives 2.2 and 3.0 is that they cut off ***floatplane access*** He noted that floatplanes travel from saltwater to freshwater using an access road at the airport that cuts across Alternatives 2.2 and 3.0 near the shoreline. He said that about five floatplane pilots would have no other option in Seward.

- ***The cumulative impact costs of Alternatives 1.1, 2.2and 3.0 should be compared. Mr. Mahalak expressed the need to study hydrologically the impact of closing the runway, as well as related to socioeconomic concerns.***
- The project should ***consider the conversion of an asset like the runway rather than the abandonment of it.***
- Also, he expressed the need to ***study hydrologically, the impact of this "retreat"***(from Runway 13/31).

Mr. Janke (DOT&PF Hydrologist) commented that he does not like Alternative 1.1 because it transfers the bank erosion and flooding issues elsewhere. He commented that under Alternative 2.2, the main runway is closed, and the river will have more of a natural channel. The cumulative impact of this change to a natural channel has not been studied. (Ms. Beaton noted that the plan was to leave the embankment for Runway 13-31 in place and let breaching of the runway occur naturally, over time.
Mr. Kubitz (ARRC) commented on ***RPZ conflicts on the south and on the north***. He asked for ***more information related to height restrictions on ARRC property***. He noted that the ARRC is creating a new barge basin next to the flight path of Alternative 3.0. He raised a concern about any of the ***alternatives changing the hydrology so that more sediment is deposited on DNR or ARRC property.***

Ms. Terry (City of Seward) commented that she is a ***proponent of dredging***. She asked if this idea was given a through second look as suggested at the last SWG meeting. Ms. Conlon and Ms. Beaton explained DOT&PF's position on dredging—that it is not a viable option given liability and operations and maintenance costs. Mr. Long and Ms. Terry noted that the ***public will want to hear a strong message, one with data and background, to explain why other agencies can dredge*** (ARRC and the City, for example) while DOT&PF will not. Ms. Terry also expressed the need for ***more study of potential conflicts between Alaska Railroad operations (cranes, barges, etc.) and aircraft operations (penetrations to airspace)*** *in the area of the* jetty.

Ms. Hendrickson (ARRC) expressed the need for ***dialogue between ARRC and DOT&PF*** on this project, including on topics such as ***protecting existing infrastructure investment, use of pre-disaster FEMA funds, and the sharing of data, particularly for environmental impact categories.*** She also expressed caution against using cost as a determining factor in a National Environmental Policy Act (NEPA) document.

Mr. Edelman, FAA, encouraged the project to ***justify improvements in terms of aviation safety*** (object clearances, RPZs, etc.). He suggested that projects should not use cost to justify alternatives.

The group as a whole expressed the need to ***weigh socioeconomic impacts highly*** as evaluation criteria (see the earlier discussion on this topic). The group also expressed ***the need for actions today that do not preclude a longer airport in the future***, AND work to achieve this future vision.

Next Steps

Ms. Conlon said that the next phase will be the environmental document (this phase has not yet been negotiated). Field work is anticipated in the fall. The project team would like to keep the SWG active throughout the process and that they anticipate another meeting during the environmental scoping process.

Action steps:

What	Who	When
Prepare/distribute SWG Mtg #3 notes	Project team to SWG	ASAP
Post public meeting notes to project website http://www.dot.alaska.gov/creg/sewardairport/index.shtml	Solstice	Done
Distribute final Hydrology Report to ARRC	Project Team	When it is finalized
Provide any additional comments by May 13, 2016, which is the official comment period set related to the public meeting and this information cycle	SWG	May 13, 2016
Share outline of ARRC's existing environmental documentation	Christina Hendrickson, ARRC, to Project Team	ASAP
Perform data "gap analysis"	Project Team	
Share (ARRC) environmental work and economic analysis to date (from ongoing ARRC planning work)	ARRC to Project Team	
Consider hydrologic and sedimentimpacts as a result of abandoning the main runway to ARRC properties	Project Team	
Coordinate with ARRC related to ARRC release of their interest in the lease area occupied by the aprons	Project Team	
Provide Far Part 77 elevations of Alternatives 2.2and 3.0 to ARRC	Project Team to ARRC	
Provide more detailed information on ROW costs versus construction costs as part of analysis	Project Team	
Take a closer look at floatplane access with Alternatives 2.2and 3.0	Project Team	
Take a closer look at the Olsen property and the suggestion to acquire the property or an airspace easement to remedy the situation with the crane.	Project Team	
Convey decision of what alternatives will advance to the next phase, Environmental Documentation	Project Team to SWG	
SWG meeting	Project Team and SWG	Potentially this summer

Adjourn

The meeting concluded at approximately3:45 pm. Thank you for your participation!

Carla SlatonBarker

To: Carla SlatonBarker
Subject: RE: Seward Airport: Requesting your SWG Comments

From: Carla SlatonBarker [mailto:Carla@solsticeak.com]
Sent: Wednesday, May 25, 2016 4:28 PM
To: 'Montgomery, Sean (DOT)' <sean.montgomery@alaska.gov>
Subject: RE: Seward Airport: Requesting your SWG Comments

Thanks!

From: Montgomery, Sean (DOT) [mailto:sean.montgomery@alaska.gov]
Sent: Wednesday, May 25, 2016 4:27 PM
To: Carla SlatonBarker <Carla@solsticeak.com>
Subject: RE: Seward Airport: Requesting your SWG Comments

I think it is going to have to be fenced to comply with FAA standards especially for wildlife control. With the 2.2 plan access will be blocked off to the Leirer property. I don't know what the property paperwork says but someone said it was granted to ducks unlimited for hunting and the access could not be blocked. I am not 100% sure on all this though. I will check on the fence tomorrow.

From: Carla SlatonBarker [mailto:Carla@solsticeak.com]
Sent: Wednesday, May 25, 2016 4:22 PM
To: Montgomery, Sean (DOT) <sean.montgomery@alaska.gov>
Subject: RE: Seward Airport: Requesting your SWG Comments

At the public meeting one person just asked about fencing/voiced concerns over a future fence around the airport, and impacts to access to tidelands, birdwatching areas, etc. What was the fencing plan? Barb said that in this conversation, Barb responded to this person by noting that fencing was not under consideration yet—that the team at this meeting was presenting alternatives to determine which alternative to move forward with.

Could this be the Leirer Family property are you are mentioning? Email me a sentence describing the issue, and I'll log it in .

From: Montgomery, Sean (DOT) [mailto:sean.montgomery@alaska.gov]
Sent: Wednesday, May 25, 2016 4:03 PM
To: Carla SlatonBarker <Carla@solsticeak.com>
Subject: RE: Seward Airport: Requesting your SWG Comments

That is ok. Not really, I do like the 2.2 design. What was said about fencing and access to the Leirer Family property at the public meeting?

From: Carla SlatonBarker [mailto:Carla@solsticeak.com]
Sent: Wednesday, May 25, 2016 4:00 PM
To: Montgomery, Sean (DOT) <sean.montgomery@alaska.gov>; bca.alaska@gmail.com; BearLakePilot@gmail.com;

Perry, Dennis T (DOC) <dennis.perry@alaska.gov>
Cc: 'Robin Reich' <robin@solsticeak.com>; 'Royce Conlon' <RoyceConlon@pdceng.com>
Subject: RE: Seward Airport: Requesting your SWG Comments

Hi Sean, that's terrible that we didn't know you were there! Sorry we didn't acknowledge you. Do you have anything to add beyond what members offered at the meeting?
Carla

From: Montgomery, Sean (DOT) [mailto:sean.montgomery@alaska.gov]
Sent: Wednesday, May 25, 2016 3:51 PM
To: Carla SlatonBarker <Carla@solsticeak.com>; bca.alaska@gmail.com; BearLakePilot@gmail.com; Perry, Dennis T (DOC) <dennis.perry@alaska.gov>
Cc: 'Robin Reich' <robin@solsticeak.com>; 'Royce Conlon' <RoyceConlon@pdceng.com>
Subject: RE: Seward Airport: Requesting your SWG Comments

I made the meeting over the phone but I was a few minutes late.

From: Carla SlatonBarker [mailto:Carla@solsticeak.com]
Sent: Wednesday, May 25, 2016 3:40 PM
To: bca.alaska@gmail.com; BearLakePilot@gmail.com; Perry, Dennis T (DOC) <dennis.perry@alaska.gov>; Montgomery, Sean (DOT) <sean.montgomery@alaska.gov>
Cc: 'Robin Reich' <robin@solsticeak.com>; 'Royce Conlon' <RoyceConlon@pdceng.com>
Subject: Seward Airport: Requesting your SWG Comments

Hi Dennis, Brandon, and Sean,
I'm emailing to make sure we hear from you three Seward Airport Improvements Project Stakeholder Working Group (SWG) members. We held the third meeting of the SWG on April 20, 2016, in advance of a public meeting. I know that you three had a conflict with the meeting date, so the project team wanted to reach out to you to make sure you have read and understand the meeting information sent in advance and to take your comment. Your input is really important to the process. We presented the same information at the SWG meeting and at the public meeting, so I wanted to direct your attention to the public meeting materials posted online and in the links below (the files are so large, I think this is the easiest way for you to access and review the documents). Here are the links to review the information that SWG members heard at the meeting:

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Location Study/Alternatives Memo, Presented to SWG

SWG members reviewed this document in advance of the meeting. This document was used to prepare the information boards in the links above. Note: team members discussed Alternative 2.2 as the most viable alternative in terms of design and engineering considerations because it would meet the community's near-term aviation needs for GA and medevac operations. http://www.dot.alaska.gov/creg/sewardairport/documents/SWD_DRAFT_Alternatives_Memo_1_022916.pdf

We'd love to solicit your input on alternatives, particularly on the advantages and disadvantages of the three alternatives presented. To do this, you can email me your thoughts, or please let me know if a phone conversation would be beneficial. I'd be happy to speak with you or to set up a conversation with a technical team lead. I'll touch base with you by phone and email next week, to see what method works best for you. Thank you!

Carla SlatonBarker
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, Alaska 99503
907.929.5960

Carla SlatonBarker

From:	Dennis Perry <bearlakepilot@gmail.com>
Sent:	Thursday, June 2, 2016 9:09 PM
To:	Carla SlatonBarker
Subject:	Re: Seward Airport: Requesting your SWG Comments

Carla,
I think the best alternative is the third one. I am in favor of increasing the length to the shoreline, and it will only be 250 ft shorter than the existing 13/31. In addition, I have been working with AOPA to develop an approach which will not be affected by either alternative, as the approach would primarily occur over the bay, and include a missed approach that would involve staying over the bay. The approach would terminate at 500' as the MDA, and allow for a circling approach to land, leaving choice of runway to the pilot. We believe it has the potential to increase traffic considerably at the airport.

I apologize it took me so long to respond. I have been researching this for a while. Talk soon.
Dennis Perry

Sent from my iPad

On May 25, 2016, at 3:59 PM, Carla SlatonBarker <Carla@solsticeak.com> wrote:

> Hi Sean, that's terrible that we didn't know you were there! Sorry we didn't acknowledge you. Do you have anything to add beyond what members offered at the meeting?
> Carla
>
> ---
>
> **From:** Montgomery, Sean (DOT) [mailto:sean.montgomery@alaska.gov]
> **Sent:** Wednesday, May 25, 2016 3:51 PM
> **To:** Carla SlatonBarker <Carla@solsticeak.com>; bca.alaska@gmail.com; BearLakePilot@gmail.com; Perry, Dennis T (DOC) <dennis.perry@alaska.gov>
> **Cc:** 'Robin Reich' <robin@solsticeak.com>; 'Royce Conlon' <RoyceConlon@pdceng.com>
> **Subject:** RE: Seward Airport: Requesting your SWG Comments
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Thank you!

Carla SlatonBarker
Solstice Alaska Consulting, Inc.
2607 Fairbanks Street, Suite B
Anchorage, Alaska 99503
907.929.5960

<image001.jpg>

Carla SlatonBarker

From:	Brandon Anderson <bca.alaska@gmail.com>
Sent:	Thursday, June 2, 2016 7:49 AM
To:	Carla SlatonBarker
Subject:	Re: Seward Airport: Requesting your SWG Comments

Hello Carla,
After reading through this it seems like the options are quite limited, and perhaps the decisions have already been made. It seems option 2 is the way to go, considering all of the issues.
I disagree with the premise that the traffic, historically, is not enough to warrant more investment. There used to be a lot more traffic (Coast Guard C-130s landing regularly, private jets, etc.) before the flooding problems and weight limits were imposed.

Let me know if you want to hear more from me.
Brandon Anderson

On Wed, May 25, 2016 at 3:40 PM, Carla SlatonBarker <Carla@solsticeak.com> wrote:

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>
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Thank you!

Carla SlatonBarker

Solstice Alaska Consulting, Inc.

2607 Fairbanks Street, Suite B

Anchorage, Alaska 99503

907.929.5960

SOLSTICE alaska consulting inc

January 19, 2015
Mr. Ron Long, Assistant Manager
City of Seward
P.O. Box 167
Seward, Alaska 9966

Re: Seward Airport Rehabilitation and Upgrade Project

Dear Mr. Long:

As the City of Seward's lease holder and operator of the Seward Shipyard, I am writing in support of the Alaska Department of Public Facility's (ADOTPF) Seward Airport Rehabilitation and Upgrade Project (Airport Upgrade).

Vigor Alaska is committed to the expansion and improvement of the marine industrial support sector in Seward. Shipyards rely on timely and affordable transportation and logistics to be competitive in the today's economics.

While the one hundred and twenty five mile drive from Anchorage to Seward Highway offers unmatched views of Alaska in all her beauty, the two and one half hour drive each way creates a competitive disadvantage to the Seward Shipyard. Seward's location on Resurrection Bay is ideal for access by the many marine vessels operating in the region serving Valdez, Cook Inlet, the Aleutian Chain and western Alaska. Seward's location as it relates to road access to Anchorage , which is Alaska's major shipping and logistics center, is problematic. Aside from the five hour round trip drive, the Seward Highway is hazardous in the winter and subject to closure from avalanche hazard.

As operators of one of Alaska's largest shipyards, we depend on a wide array of production personnel, contractors and vendor technicians to accomplish complex and high volume vessel repair, maintenance and conversion work on time and on budget.

Complex ship repair work often requires specialized production personnel for critical short term repair processes. Vigor Alaska routinely dispatches production specialists from our six other shipyard locations in Oregon, Washington, and Ketchikan to Seward to support peaks in labor demand. Vendor technical personnel are routinely required for major equipment installation and service.

US Coast Guard (USCG) inspection and safety personnel stationed Anchorage currently require at least a full day to accomplish critical inspections of ship repair work that often require an hour or less to complete. Critical ship repair production activities cannot proceed without USCG inspection and approval. Inspection delays create cascading financial impacts for both marine vessel operators facing rigid schedule requirements and for Vigor Alaska facing strict contract requirements for timely completion of vessel repair work.

The airport upgrade project will enable scheduled air service between Seward to Anchorage and other major Alaska cities facilitating the growth improvement of the states emerging marine industrial support sector. Vigor Alaska supports the Seward airport project to provide a year round safe, affordable, and efficient, transportation link for our employees and the many technical personnel required to conduct competitive ship repair and maintenance activities at the Seward Shipyard.

Sincerely:

Doug Ward
Director of Shipyard Development

3801 N Tongass, P.O. Box 9470, Ketchikan, AK 99901
Phone 907.225.7199 / fax 907.247.7199 / vigoralaska.com

Ken Risse

From: Robert.D.Hornick@uscg.mil on behalf of Hornick, Robert D LT <Robert.D.Hornick@uscg.mil>
Sent: Thursday, August 14, 2014 12:18 PM
To: Ken Risse
Cc: Coulter, Nathan CDR
Subject: RE: PDC Engineering Facility Requirement - Seward

I do not know who does the pavement strength tests or who funds them. The LCN report I was stating came from an Air Force report. We just go by what is published in the AK aviation supplement.

As far as the use of an airfield during a mass casualty or natural disaster, if the runway is still usable we would/can use the C130 as an air ambulance to get people to higher level of care quicker.

As far as the chain of command, we normally get our direction through our district office in Juneau Alaska.

The H60 / H65 helicopters have used Seward before, and usually they only require gas. As stated earlier the C130's have not been there in a while. I will not say we will never use Seward for SAR, as we never know what situation will present itself. Having Seward available for use by C130's only allows for increased flexibility/capability to respond.

If Seward were rated for C130 use we would use it training pilots to land on shorter/narrower runways. Currently the only other field we use that is close to Sewards dimensions is Dutch Harbor and that is a 2 hr flight. You would probably see weekly flights stopping by for touch and go's. C130's would need no other services.

Let me know if you have any more questions.

LT Robert Hornick
C-130 Assistant Operations Officer
Robert.D.Hornick@uscg.mil
(W) 907-487-5586
(C) 858-752-3103

-----Original Message-----
From: prvs=296a1c91b=KenRisse@pdceng.com [mailto:prvs=296a1c91b=KenRisse@pdceng.com] On Behalf Of Ken Risse
Sent: Thursday, August 14, 2014 10:12 AM
To: Hornick, Robert D LT
Cc: Coulter, Nathan CDR
Subject: RE: PDC Engineering Facility Requirement - Seward

LT. Hornick,

Thanks for the reply. Can you tell me more about the way the Coast Guard would handle mass casualties or medical evacuations? For instance, if there were an accident with a fishing boat, cruise ship or other vessel with a dozen injuries, would the Coast Guard C-130 act as a medical ambulance moving mass casualties to hospitals in Anchorage or other cities? If there were a natural disaster, not at sea, such as an earthquake, fire or flood, would the Coast Guard respond under FEMA direction?

For the pavement strength, you mentioned that it previously had an LCN of 14. Do you go by the published pavement strength in the 5010 records (currently not available), or does the military test pavement strength at airports it plans to use?

If there were no pavement strength limitations/restrictions, how many annual C-130 operations would you expect at Seward in a typical year?

Would Coast Guard search and rescue operations ever be based out of Seward? If so, what airport facilities are needed?

Thanks for your help.

Ken Risse, PE, Senior Associate
Civil Engineer

PDC Inc. Engineers
Planning Design Construction

1028 Aurora Drive | Fairbanks, Alaska 99709 v 907.452.1414 | f 907.456.2707 | www.pdceng.com
"Transforming Challenges into Solutions"

-----Original Message-----
From: Robert.D.Hornick@uscg.mil [mailto:Robert.D.Hornick@uscg.mil]
Sent: Wednesday, August 13, 2014 3:33 PM
To: Ken Risse
Cc: Coulter, Nathan CDR
Subject: RE: PDC Engineering Facility Requirement - Seward

Ken,
Understand you are inquiring about Coast Guard operations at the Seward airport with regards to C130 operations and impacts.
Since I have been here (2012) we have not used Seward due to the fact that it is no longer tested for the C130 bearing capacity. From what I have been told we used to operate there when it was certified for our weight.

The real impact for Coast Guard operations is for expedient planning in case of mass casualty or Medical Evacuation that would allow a quicker response via C130 than an H60. Additionally, if an H60 needed fuel and a fuel provider was not available at the airport the C130 could provide fuel. With the bearing capacity as it stands we would need a DOT waiver, which could take some time. The last report, before the 12,500 NOTAM restriction was established, is that the main Runway has an LCN of 14 equating to a max gross C130 weight of 100,000 lbs. With a runway length of 4500 we can normally operate at about 120,000 lbs, allowing enough fuel and gear to respond to the majority of situations.

Let me know if you have any questions.

LT Robert Hornick
C-130 Assistant Operations Officer
Robert.D.Hornick@uscg.mil
(W) 907-487-5586
(C) 858-752-3103

-----Original Message-----
From: Vojtech, Zachary R LT
Sent: Wednesday, August 13, 2014 2:58 PM
To: Hornick, Robert D LT
Cc: DeAngelo, Daniel J LT; Coulter, Nathan CDR
Subject: PDC Engineering Facility Requirement - Seward

Bob,

I received a phone call from Ken Risse who works for PDC Consulting Engineers, contract work with Dept of Transportation. They are putting together a Facility Requirement Chapter for the Seward airport and would like to know the importance of Seward in regards to the Coast Guard. Specifically, they are deciding whether or not the DOT should shorten the runway or change the weight capability, but would like to know impacts to our C-130 operations.

Ken Risse's phone number is 907-452-1414 and email is kenrisse@pdceng.com.

He will be completing this chapter by Friday, and would like to add our input to it before then.

Thank you.

Zach

LT Zach Vojtech
Air Station Kodiak
w: (907)487-5887

Shell Exploration & Production Company
3601 C Street, Suite 1000
Anchorage, Alaska 99503
Tel 907.770.3700
Fax 907.646.7135
Internet http://www.shell.us/alaska

February 9, 2015

Mr. Ron Long, Assistant Manager
City of Seward
P.O. Box 167
Seward, Alaska 99664
Re: Seward Airport Rehabilitation and Upgrade Project

Dear Mr. Long:

I am writing in support of the Alaska Department of Transportation & Public Facilities' (ADOTPF) Seward Airport Rehabilitation and Upgrade Project.

Shell Alaska recognizes significant opportunity with the Seward Airport Rehabilitation and Upgrade Project. Given the dynamic nature of our operations, we are frequently in search of viable marine ports and associated services that will enhance our ability to operate exceptionally well while engaging in Outer Continental Shelf (OCS) energy exploration and development. To that end, Seward's deep water port is an attractive option for consideration.

During our 2012 operations, Shell Alaska utilized Seward to support our fleet and one of our drilling units. Road transportation was utilized to support these assets. An upgrade to the existing airport would permit Shell to factor charter air transportation of material and personnel more aggressively than in the past to support our current operations while introducing a strong planning factor for future operations. Moreover, with the expansion of the marine industry in Seward to include Vigor, we strongly believe that demand for significant and reliable air services will only increase, not decrease.

In closing, Shell Alaska supports the Seward airport project to provide a year round safe, affordable, and efficient transportation link for our employees and the many technical personnel required to conduct ship repair and maintenance activities at the Seward Shipyard.

Sincerely,

M D Guaday

Mark Guadagnini
Vice President, Arctic Maritime & Logistics
Shell Exploration and Production Company

From Allan Ball **Date** Tuesday, December 11, 2012 2:31:22 PM
To Beaton, Barbara J (DOT)
Cc Rule, Michael J (DOT)
Subject NetJets aircraft information document

Fleet Resource 10.26.12.pdf (19 KB HTML)

Hello Barb,

Thank you for your time today. As I explained, this request is for one of our aircraft Owners that is connecting with a cruise departing/arriving Seward and will likely be a one shot trip. I believe that his aircraft selection will be based upon the usable runway length and the size aircraft that can safely conduct operations at Seward. The different sizes and weights are included on the document that I have attached. If the runway is +4500 feet in length, the potential aircraft could be one of our Falcons (DA2000 or DA2EASy) – and the weight would probably be limited by the performance of the aircraft on a short runway. I can get you representative weights at your request. Or if the runway is +4200 in length, the aircraft with legs that could reach Seward from the lower 48 is probably the CE680 (Citation Sovereign). We will await your review before presenting any information to the Owner. It is our request that we could provide them adequate information sometime in December if at all possible.

A pleasure talking with you, I look forward to continuing the discussion.

Best regards,

Al Ball
Manager
Operational Intelligence & Analysis
NetJets® Inc.

4111 Bridgeway Avenue
Columbus, OH 43219
T: 614 239 4873
C: 614 208 6164
F: 614 239 5235
e: ball@netjets.com
www.netjets.com
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