4.0 SPONSOR'S PROPOSED ACTION

The following sections briefly summarize the actions proposed by the Airport Sponsor to meet the Purpose and Need identified in previous sections. Each of these actions is described in greater detail in Chapter 2 of the FEIS.

4.1 INCREASE RUNWAY SAFETY AREA (RSA)

To bring the Airport into compliance with FAA standards for RSA, the current runway would be modified and new RSA would be added to runway ends and sides. The Runway 08 landing threshold would be displaced 120 feet to the east, and another 230 feet of RSA would be added to the west end, resulting in a safety area that meets FAA standards of 1,000 feet in length for Runway 26 overruns, 600 feet in length for Runway 08 undershoots, and 500 feet in width for lateral excursions. Additional fill and disturbance would be required for about 96 more linear feet west of the RSA to accommodate relocation of the Float Plane Pond access road and Dike Trail/Emergency Vehicle Access Road (EVAR).

The Runway 26 threshold would be extended 520 feet to the east, so that approximately 850 linear feet would need to be filled on the east end of the runway for the threshold relocation and RSA construction. The parallel taxiway (Taxiway A) would also be extended approximately 520 feet east with a connector to the runway at the east end, so that aircraft can taxi to and from the new Runway 26 threshold. The safety area would meet FAA standards with a 1,000-foot overrun protection for Runway 08, 600-foot undershoot protection for Runway 26, and 500 feet in width for lateral excursions.

In addition, the lateral RSA along approximately 3,500 feet of the south side of the runway would be extended out an additional 132 feet to meet FAA's 500-foot width requirements for RSA. Finally, RSA would be extended out over Jordan Creek on the north side of the runway, between the runway and Taxiway A. This action, the Airport's Proposed Action, is Alternative RSA-5E.

4.2 INSTALL MALSR ON RUNWAY 26 APPROACH

To improve navigational alignment with Runway 26, FAA has proposed to install a medium-intensity approach lighting system with runway alignment indicator lights (MALSR). The MALSR would consist of up to 14 light support towers spaced at 200-foot intervals, extending 2,400 feet east of the threshold. Access to and maintenance and repair of the MALSR would be accomplished with a permanent, at-grade road. This action, the Airport's Proposed Action, is Alternative NAV-2B.

4.3 SNOW REMOVAL EQUIPMENT AND MAINTENANCE FACILITY (SREF)

JNU has proposed to construct a new, approximately 44,000-square-foot SREF to be co-located with a new, approximately 12,100-square-foot sand and chemical storage building on 6.7 acres of Airport property in the Northeast Development Area. The facility would include parking,

room for equipment turnaround and changeovers, outside loading and unloading, and snow storage. This action, the Airport's Proposed Action, is Alternative SREF-3B1.

4.4 FUEL FARM ACCESS ROAD

JNU has proposed to construct a new road that leads directly south from the fuel farm to the main Airport facilities. This roadway would directly link the bulk fuel storage facility with the aircraft operating area. The proposed roadway alignment would require installation of a bottomless arch or bottomless box culvert in Duck Creek. This action, the Airport's Proposed Action, is Alternative FF-1.

4.5 AIRCRAFT PARKING AND STORAGE

Recognizing the current facility deficiencies at the Airport and relying on aviation demand estimates generated for the EIS, JNU has proposed to develop additional transient and based aircraft parking and tie-downs in the Northeast and Northwest Development Areas, 38 new T-hangars and executive hangars, primarily in the Northwest Development Area, and two new, fixed-base helicopter operations and hangars in the Northeast Development Area. Commercial operations in the Northeast Development Area would be expanded with the addition of seven new commercial or corporate hangars and/or fixed base operations. This action, the Airport's Proposed Action, is Alternative FW/RW-2.

4.6 IMPLEMENT A REVISED WILDLIFE HAZARD MANAGEMENT PLAN (WHMP)

The Airport has proposed a number of wildlife habitat modifications and hazard management actions, listed below, that would constitute a revised WHMP.

- Filling and grading the wetlands located near the mouth of Duck Creek, on and off Airport property west of Runway 08.
- Relocating the mouth of Duck Creek to the northern Airport boundary.
- Removing swales and areas that pond water along the edges of the runway and parallel taxiway by filling, leveling, and grading the areas.
- Altering vegetation management techniques and increased hazing in the infield areas.
- Removing vegetation from the Float Plane Pond by dredging all waters south of the Float Plane Pond and the main portion of the pond (where vegetation exists) to a depth of at least 10 feet.
- Removing the dam at the mouth of Jordan Creek.
- Implementing an adaptive hazard management approach to the Float Plane Pond woodlands. Initial habitat modifications would include:
    - Installation of a deer fence along the north side of the dike, from the existing fence on the west end to the existing fence on the east end.
    - Removal of corvid nests, as needed, to prevent re-establishment of crow rookeries in the woodlands.

5.0 NECESSARY FEDERAL, STATE, AND LOCAL ACTIONS

The FAA has statutory authority to ensure that the safe operation of JNU and the nation's airport and airway system is the highest aviation priority (49 U.S.C. 47101[a][1]). In carrying out its responsibilities, the FAA is responsible for ensuring that its actions are in compliance with NEPA. The FAA's Airports Program is responsible for analyzing the environmental impacts and consequences of a proposed federal action involving airports. FAA is also responsible for ensuring that airport development projects provide for the protection and enhancement of natural resources and the quality of the environment (49 U.S.C. 47101[a][6]). As the lead federal agency, the FAA was responsible for supervision of preparation of the EIS (40 CFR §1501.5[a]) and for requesting the participation of cooperating agencies as defined by CEQ (40 CFR §1506.6).

There are other decisions FAA must make in conjunction with these actions. The Airport Layout Plan must be updated to reflect changes, and JNU must receive FAA approval of the updated Airport Layout Plan. FAA will also ensure that proposed development will not adversely affect safe and efficient use of airspace. Full approval of the revised WHMP depends on FAA's approval of the updated Airport Certification Manual. FAA and the Airport will develop an airport capital improvement program to financially assist the Airport with implementation of those actions determined to be eligible for FAA funding through the federal grant-in-aid program and the use of passenger facility charge funds.

Under the Department of Transportation Act (49 U.S.C. Subtitle I, Section 303), the FAA must consult with the landowners of Section 4(f) properties and officials having jurisdiction over those properties. These properties can include publicly-owned park lands, recreation areas, wildlife or waterfowl refuges, and historic sites of local, state, or national significance. Potential Section 4(f) properties must be identified and described, and potential impacts to them disclosed, in the EIS. If one or more of the actions considered in the EIS would require the use of Section 4(f) lands, the FAA must demonstrate that there is no feasible and prudent alternative unless impacts are determined to be *de minimis*. In addition, the action(s) must include all possible planning to minimize harm resulting from the use of Section 4(f) lands.

FAA recognized before scoping the EIS that numerous state, federal, and local agencies would have important roles in the projects' analyses through permitting authority, coordination requirements, and other jurisdictional standing. Importantly, many of these agencies also have substantial expertise concerning important environmental resources potentially affected by the projects, particularly for water resources, fisheries, wetlands, and wildlife. During the course of the EIS FAA held more than 35 meetings with an interagency working group to solicit early and critical feedback on alternatives, resource impacts, impact minimization features, mitigation and functional assessment criteria, and numerous other topics. The committed participation of these agencies greatly benefited the analysis and strongly influenced the scope of the projects. In addition, consistent agency involvement facilitated development of a compensatory mitigation plan and established a simplified process for environmental permitting.

There are a number of federal, state, and local permits, approvals, and regulatory determinations and consultations that must be approved and/or completed for the Sponsor's proposed actions or alternatives to those actions to be implemented. Included are other FAA determinations and approvals concerning specific changes to the Airport and airspace. Table 2 lists the possible approvals, permits, consultations, and determinations necessary for the actions described in the FEIS and approved in this ROD to be implemented.

Table 2. Permits, Approvals, Certifications and Consultations for Implementation of JNU Projects

Agency	Action	Authority and Basis of Action
FAA	Record of Decision	42 U.S.C. §4321 et seq. and 40 CFR §1500 et seq. The Record of Decision will document authorization for actions approved.
	Certifications	Federal Aviation Regulation Part 139 FAA approval of the Airport's Certification Manual. 49 U.S.C. §44502(b). A certification that the proposed facility is reasonably necessary for use in air commerce or from the national defense.
	Approval	49 U.S.C. §40103; 49 U.S.C. §44502; and 49 U.S.C. §47105. FAA must approve Airport Layout Plan revisions and make a determination of no adverse affect to safe, efficient use of airspace.
	Approval and Funding	49 U.S.C. §47104 et seq. and 49 U.S.C. §470117. FAA will determine how much financial support can be provided for the proposed development projects.
	Approval	49 U.S.C. §44502(a)(1). FAA must approve relocation or upgrade of existing navigational aids.
	Determinations	14 CFR Part 77. Concerning possible obstructions to navigable airspace. 14 CFR Part 157. Whether FAA objects to JNU's development proposal from airspace perspective. 49 U.S.C. Subtitle I, Section 303, Department of Transportation Act, Section 4(f). Concerning impacts to public parks, recreation area, or wildlife and waterfowl refuge of national, state or local significance.
	Consultation	Section 307 of the Coastal Zone Management Act (16 U.S.C. §1458(c)). Requires that the applicant certify that the project is in compliance with an approved State Coastal Zone Management Program and that the State concurs with the applicant's certification prior to FAA approval of the project and Airport Layout Plan.

Table 2. Permits, Approvals, Certifications and Consultations for Implementation of JNU Projects

Agency	Action	Authority and Basis of Action
U.S. Army Corps of Engineers	Permit	Section 10 of the Rivers and Harbors Act (33 U.S.C. §403). Approval required for any structures to be placed in navigable waters of the U.S., or for work in or affecting navigable waters of the U.S.
	Permit	Section 404 of the Clean Water Act (33 U.S.C. §1344). Approval required for the discharge of dredged and/or fill material into waters of the U.S., including wetlands.
	Permit	Section 103 of the Marine Protection, Research, and Sanctuaries Act (33 U.S.C. §1413). Approval required for the transport of dredged material for the purpose of dumping it into ocean waters.
	Consultation	Section 307 of the Coastal Zone Management Act (16 U.S.C. §1458[c]). Applicant must certify that the project complies with an approved State Coastal Zone Management Program and that the State concurs.
NMFS	Consultation And Opinion	Section 7 of Endangered Species Act. NMFS will issue Biological Opinion concerning potential effects of the Airport actions on endangered or threatened species.
	Consultation and Recommendation	Magnuson-Stevens Act (16 U.S.C. §1855[b]). NMFS will provide a conservation recommendation to the FAA and the agency must provide a detailed response in writing documenting measures for avoiding, mitigating, or offsetting the impacts on essential fish habitat.
	Consultation	Marine Mammal Protection Act (16 U.S.C. §1361-1421; Pub. L. 92-522). Service will determine whether the actions being considered have the potential to constitute a "taking" of marine mammals.
	Consultation	Fish and Wildlife Coordination Act (16 U.S.C. §661-667e). Requires consultation with NMFS (and FWS and ADF&G) when waters are proposed or authorized or permitted to be controlled or modified, so that loss of and damage to wildlife resources can be prevented. Pursuant to authority of this Act, NMFS (and FWS) also provide comment and recommendations to the Corps concerning Clean Water Act Section 404 Permits and Section 10 Permits issued under authority of the Rivers and Harbors Act.

Table 2. Permits, Approvals, Certifications and Consultations for Implementation of JNU Projects

Agency	Action	Authority and Basis of Action
FWS	Permit	Migratory Bird Treaty Act (regulations at 50 CFR Part 21.43). A federal depredation permit is required for the destruction of birds to control wildlife hazards at airports.
	Permit	Bald and Golden Eagle Protection Act (regulations at 50 CFR Part 22.23). An eagle depredation permit which allows the harassment of bald eagles but prohibits the killing, injuring, or capturing of eagles may be issued by the FWS for the alleviation of hazards to aircraft safety.
	Consultation	Fish and Wildlife Coordination Act (16 U.S.C. §661-667e). See above, as described for NMFS.
EPA	Consultation	Section 309 of Clean Air Act. This Act provides the EPA with authority to review and comment on federal actions conducted under NEPA.
	Permit	Section 402 of the Federal Water Pollution Control Act.
ADF&G	Special Area Permit	5 AAC §95.420. A special area permit is required for any habitat-altering work, including any construction activity in a designated state refuge, critical habitat area, or sanctuary.
	Public Safety Permit	Permit for Scientific, Educational, Propagative, or Public Safety Purposes (5 AAC §92.033). A public safety permit for the taking of game species at JNU is necessary for all direct wildlife control operations.
Alaska SHPO	Consultation and Concurrence	Section 106 of National Historic Preservation Act. Written statement from SHPO acknowledging appropriate consultation was undertaken and concurring with the findings of the field inventories should be received as evidence of compliance with the governing legislation.
Alaska DEC	Certification	Section 401 of the Clean Water Act (33 U.S.C. §1344). Certification would be required that the Airport actions will meet state water quality standards before federal permits are approved, with ADEC maintaining certification authority for the NPDES program (EPA has permitting authority).

Table 2. Permits, Approvals, Certifications and Consultations for Implementation of JNU Projects

Agency	Action	Authority and Basis of Action
ADNR Division of Lands	Approval	Disposal of Refuge property through a sale or lease to the Airport (to accommodate one or more of the actions) would require a finding that the action is in the best interest of the State of Alaska.
	Permit	Leasing and Permitting of State-owned Tidelands (11 AAC §58/11 AAC §62.690-730). In some instances, the State will provide a lease or permit for use of State-owned tidelands. Actions considered could involve lease, easement on, or purchase of State-owned lands.
ADNR, OHMP	Permit	Anadromous Fish Act (AS §41.14.870). Requires that an individual or governmental agency notify and obtain approval from ADNR for all activities within or across a specified anadromous water body and all instream activities affecting a specified anadromous water body.
	Permit	Fishway Act (AS §41.14.840). Requires that an individual or governmental agency notify and obtain authorization from the ADNR for activities within or across a stream used by fish if the ADNR determines that such uses or activities could represent an impediment to the efficient passage of fish.
	Consistency Determination	Alaska Coastal Management Program (11 AAC 112). The ACMP establishes standards against which the Airport actions may be evaluated, including requirements for management of coastal habitat and protection and preservation of land, air, and water quality. The Coastal Management Program manages the Consistency Review that ensures consideration of and compliance with all applicable requirements.
CBJ	Review and Approval	Enforceable coastal zone ordinances under the CBJ Land Use Code 49.70.950F. CBJ Ordinance 49.70.400 requires receipt of FEMA permit for development in a flood hazard area.
	Review and Approval, Permit	Juneau Wetland Management Plan as codified in CBJ Land Use Code 49.70.1065-1075. Any elements of the project involving fill of wetlands and impacts to habitat in general would require evaluation for consistency with the Juneau Coastal Management Plan and the ACMP, with possible issuance of conditional use permit.
	Permit	New buildings, modifications to existing buildings, and preparation for structures and surface would require building and grading permits from CBJ. Wetlands permit required for development in Class C and D (minor) wetlands under the jurisdiction of CBJ.

6.0 ALTERNATIVES CONSIDERED

Evaluation of alternatives to the Proposed Action is required by NEPA and by the CEQ (40 CFR §1502.14). The reason for this statutory mandate is that some aspects of the proposed actions may affect the environment in a manner that could be minimized or even eliminated by using an Alternative Action. Federal law requires that "possible and prudent" alternatives be included in the analysis when significant impacts would occur (49 USC 47106[c][1][B]). In the case of JNU, FAA was also bound to apply a similar test of "prudent and feasible" alternatives due to the possible impacts of proposed actions on two Section 4(f) properties, the Mendenhall Wetlands State Game Refuge (the "Refuge") and Dike Trail.[4] A range of reasonable alternatives with the potential to meet the Purpose and Need for the different proposed actions was identified in the EIS. Those that did not meet the purpose and need or were not technically feasible, economically practical, or otherwise prudent were eliminated from detailed consideration in the EIS.

For each of the needs described in Section 1.4 of the FEIS, FAA identified reasonable alternatives, including those developed in response to public scoping concerns and others addressing specific environmental or engineering issues presented by the proposed actions. However, the process of identifying alternatives was not static, and FAA continued to consider new alternatives up until publication of the Draft EIS and modifications to some alternatives during preparation of the FEIS. The continual "evolution" of alternatives was particularly true for RSA alternatives, as FAA responded to changes in federal legislation and agency directive, ongoing comment and recommendations from state and federal cooperating agencies, and public and Sponsor comment on the Draft EIS.

The following sections summarize the alternatives for each of the identified needs. Each section includes a two-part description. First, the range of alternatives initially considered is discussed, and, second, the alternatives considered in detail are described. References are provided to the applicable sections of the FEIS containing alternatives descriptions and rationale for including or eliminating alternatives from detailed analysis. The analysis included a "No Action" alternative for each of the needs.

6.1 RUNWAY SAFETY AREA

FAA guidance presents the following possible types of alternatives to consider when addressing RSAs that do not meet standards (FAA 1999):

- Construction of traditional graded areas surrounding the runway. Relocation, shifting, or realignment of the runway (while maintaining runway length).
- Reduction in the runway length where existing runway length exceeds that which is required for the existing or projected design aircraft.
- A combination of runway relocation, shifting, and grading.

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[4] Under Section 4(f) of the U.S. Department of Transportation Act (actually, DOT Section 303[c]), an alternative is feasible and prudent if it does not: 1) create any truly unique or unusual factors, 2) have costs of extraordinary magnitude, 3) result in community disruption of extraordinary magnitude, or 4) contain an accumulation of these factors.

- Declared distances.
- Engineered Materials Arresting Systems (EMAS).
- Feasibility of increasing the size of the RSA by including additional land parcels, even if it will result in an RSA of an irregular size.

FAA identified a range of runway safety area alternatives based on the above array of possible means to meet standards. It was quickly determined that, while numerous alternatives could be developed to meet the needs for RSA on runway ends, few options were available to bring the lateral safety areas up to standard.

6.1.1 LATERAL RUNWAY SAFETY AREA

Five alternatives, including the No Action, were identified for lateral RSA. Each alternative is described in more detail in Section 2.2.1 of the FEIS.

1. ***Clear and Grade along the Existing Runway Shoulders.*** Clearing, adding more fill material, and grading the existing shoulders of the runway would be required to address the RSA deficiency along the south side of the eastern portion of the runway shoulder. Depending on the configuration resulting from RSA improvements to the runway ends, up to 13.8 acres could need to be filled and graded to develop the lateral RSA. The estimated cost to construct this alternative is $2.1 million, based on the size of the safety area deficiency (which could vary with changes to runway thresholds).
2. ***Relocate or Realign the Runways and Taxiways.*** The primary runway at JNU could be relocated or realigned to achieve FAA standards for lateral RSA and to reduce environmental impact to important habitat. Although only the eastern portion of the RSA is deficient in width, the entire runway would have to be relocated north by approximately 136 feet (to maintain optimal aircraft performance). This alternative was deemed neither reasonable nor prudent, based on the excessively high cost to relocate the runway/taxiway system, changes to flight patterns and possible new terrain obstructions, and the potential loss of required navigational performance (RNP) procedures frequently used by Alaska Airline to land at and take off from JNU.
3. ***Construct an Elevated RSA Surface.*** A possible alternative to minimize environmental impacts would be to construct an elevated RSA surface on piers. The elevated pier structure would have to be designed to carry maximum aircraft loads, meet appropriate grading and surface standards, allow snow removal operations to be performed as determined necessary by the Airport, and accommodate fire fighting equipment positioning and other maintenance requirements. It was determined this structure would cost in excess of $80 million, many times more than a traditional fill and grade alternative. For this reason, an elevated RSA surface was found to not be prudent and was eliminated from detailed analysis.
4. ***Engineered Materials Arresting System.*** At airport locations where other alternatives are not practicable, the FAA, working with industry, has approved the use of an EMAS that will arrest the speed of an aircraft that overruns the ends of the runway. Although only approved for use on runway ends, FAA initially considered that an EMAS along the width of the JNU runway could be used to minimize environmental impact to estuarine

habitat south of the runway. However, because EMAS has not been approved for use as an RSA substitute along runway sides where 90 degree aircraft entry is unlikely, the technology was deemed not prudent or feasible and was eliminated from further consideration.

The only prudent and feasible alternative for achieving RSA compliance along the lateral length of the runway was found to be clearing, filling, and grading along the eastern portion of the east runway. Because the lateral safety area is also dependent on runway configuration, each of the runway-end RSA alternatives incorporates lateral RSA as a necessary component.

6.1.2 END-OF-RUNWAY SAFETY AREAS

Runway-end RSA alternatives were developed following the categories outlined in FAA Order 5200.8 and described earlier (FAA 1999). Important considerations in the initial screening of RSA alternatives are how each alternative would affect runway characteristics and how those changes could affect aviation operations at the Airport. Due to terrain, winds, weather, and other factors, the operating conditions at JNU are complex. Any changes to runway thresholds or declared lengths would necessitate revisions to special RNP procedures and conceivably the loss of the procedures. Any proposed changes to these procedures would require FAA review and approval for implementation.

In addition, changing the runway threshold location can have the same effect as shortening the runway because it can move the starting point of the takeoff closer to an obstruction. To safely perform the departure procedure, the aircraft would also have to carry less weight, possibly resulting in a payload reduction. To weigh the operational impacts for the alternatives, the FAA considered whether or not each alternative would affect the existing specialized procedures and, to the extent possible, the relative magnitude of that effect. Each of the alternatives initially considered for runway-end RSA is described in Section 2.2.2 of the FEIS. Table 2-5 of that document summarizes the rationale used to include or eliminate each alternative from detailed evaluation.

The following sections provide a summary description of nine RSA alternatives that were carried forward for complete environmental analysis. Sections 2.2.2 and 2.6 of the FEIS include a detailed description of each alternative. Each alternative incorporates the action necessary to also meet standards for the lateral RSA.

RSA-1: FILL AND GRADE EXISTING DEFICIENCIES

This alternative would add over 700 additional feet of 500-foot-wide RSA at both runway ends with no change in runway thresholds or operational procedures. The RSA at the Runway 08 end would be extended another 750 feet to the west. The supporting fill material, graded at a 4:1 slope, and access roads and Dike Trail/EVAR would extend the overall project footprint farther into the Refuge and into the Mendenhall River. RSA-1 would require relocation of the river around the end of the RSA, adding as much as 3,000 linear feet to the river course. It would also require the relocation of at least the lowermost 500 feet of Duck Creek (already being considered for other development purposes and wildlife hazard management) and of the EVAR/Dike Trail

and the Float Plane Pond access road. With a 4:1 support slope, the RSA on the east runway end would encroach about 10 feet in the Refuge. A new channel for the East Runway Slough would be constructed around the RSA embankment to ensure tidal exchange north and south of the runway is maintained. To construct this alternative the Airport would have to acquire access to approximately 10.5 acres of the Refuge west of the Airport through purchase, land transfer, or lease/easement.

No changes to the published "public-use" instrument approaches, Alaska Airline's existing "special use" RNAV approaches, or the Lemon and Fox turning procedures from Runway 08 would be necessary. There would be no need to modify Taxiway A for this alternative, nor would there be a need to modify the Runway 08 MALSR. This alternative represents no potential for changes to or loss of existing aviation operations.

Alternative RSA-1 would cost approximately $16.9 million to construct, at a present worth cost of $17.1 million over a 20-year life-cycle. The estimated cost to provide compensatory mitigation for the habitat lost and negatively affected by this alternative is $2.6 million.

RSA-5C: Displace Runway 08 Threshold, Construct Additional 26 Runway and Safety Area

Alternative RSA-5C combines a 446-foot relocation of the Runway 26 threshold with an equal displacement of the Runway 08 threshold. The combination of these two actions would preserve all landing lengths and the departure length on Runway 26 and would increase the accelerate stop distance for Runway 08. The parallel taxiway would be extended 446 feet to the east to provide taxiway access to the extended runway. Approximately 1,157 feet of fill would be necessary on the east end of the runway for the threshold relocation and construction of the RSA, including a 4:1 fill slope, and 400 feet of new disturbance would be added to the west runway end to complete the RSA and accommodate relocation of the Float Plane Pond access road and Dike Trail/EVAR.

Modifications to some Runway 08 departure criteria could be needed due to the change in Runway 26 threshold (which serves as a waypoint for Runway 08 special departures). Alternative RSA-5C would require minor revisions to the published public-use instrument approaches to Runway 08. This alternative would also necessitate revisions to Alaska Airlines' existing special-use RNP RNAV approach to both runways. The Runway 08 MALSR would have to be shifted in accordance with the new approach from the west as the threshold change is not within +/- 20 feet of the 200-foot spacing increment specified in FAA Order 6850.2A.

Approximately 9.0 acres of Refuge would have to be acquired, transferred, or leased to JNU for implementation of this alternative. An additional 2.1 acres of Refuge land east of the Airport would be disturbed for construction of the slough channel to connect wetlands south of Miller-Honsinger Pond and north of the runway with the Sunny Slough.

Alternative RSA-5C would cost approximately $14.7 million to construct, at a present worth cost of $14.9 million over a 20-year life-cycle. The estimated cost to provide compensatory mitigation for the habitat lost and negatively affected by this alternative is $2.5 million.

RSA-5D: Relocate Runway 26 Threshold, Construct Additional Runway and Safety Areas

Alternative RSA-5D retains the existing Runway 08 threshold but includes relocation of the Runway 26 threshold by 400 feet to the east. A 600-foot undershoot protection would be provided for approaches to both runways and, through the use of declared distances criteria, 1,000-foot overrun protection would also be provided. The Runway 26 changes and RSA additions east of the runway would extend to the Airport boundary with the Refuge. Approximately 750 feet of fill would be necessary on the east end of the runway for the threshold relocation and construction of the RSA. The RSA west of the Runway 08 threshold would be extended 350 feet, with more fill needed to accommodate the steep RSA embankment slope and relocation of the Airport perimeter fence, Float Plane Pond access road, and Dike Trail/EVAR.

This alternative was designed to avoid direct impacts to the Refuge east of the Airport and also to take advantage of other work west of the runway, specifically, fill of wetlands to reduce wildlife hazards. As a result, however, the area disturbed to support new RSA, relocate the Float Plane Pond access road, and maintain recreational access to the Refuge south of the Airport would extend into the east side of the Mendenhall River, directly west and southwest of the runway. To compensate for the possible hydrologic changes stemming from this work an approximately equal amount of dredging would be conducted on the west riverbank.

Relocation of the Runway 26 threshold allows the existing landing and takeoff distances to be retained for both runways. Revisions to the special-use instrument approaches for Runway 26 would be required, and modifications to some Runway 08 departure criteria may be needed due to the change in Runway 26 threshold (which serves as a waypoint for Runway 08 special departures).

Approximately 8.1 acres of Refuge would have to be acquired, transferred, or leased to JNU for implementation of this alternative. An additional 4.5 acres of Refuge land east of the Airport would be disturbed for construction of the relocated sloughs and tidal channels, including East Runway Slough.

Alternative RSA-5D would cost approximately $15 million to construct, at a present worth cost of $15.3 million over a 20-year life-cycle. The estimated cost to provide compensatory mitigation for the habitat lost and negatively affected by this alternative is $2.65 million.

RSA-5E: Displace Runway 08 Threshold 120 Feet and Construct Additional 26 Runway and Safety Area

This alternative was developed by FAA and CBJ, in consultation with the Cooperating Agencies, in recognition that some alternatives included in the DEIS would encroach into the Mendenhall River west of the Airport. Alternative RSA-5E therefore represents a modification of alternatives evaluated in the DEIS, combining the use of standard safety area construction with displaced and relocated thresholds to maintain full runway length. Each runway would have 600-foot undershoot protection and 1,000-foot RSA for overruns. JNU informed FAA that Alternative RSA-5E is the Sponsor's Proposed Action for the FEIS.

The Runway 26 threshold would be relocated east another 520 feet, followed by 600 additional feet of newly constructed RSA. To enable aircraft to taxi to and from the new Runway 26 threshold, the parallel taxiway would also be extended 520 feet east. The lateral RSA would be constructed for the length of the runway to provide the standard 500-foot RSA width. The location of the Runway 08 landing threshold would be displaced 120 feet east, although departures from that runway would begin at their current brake-release point. The runway ends would be designated on both runways to accommodate 1,000-foot RSA overrun protection. The Airport perimeter would be extended westward about 138 feet, with a new fence separating the Airport from the Refuge and relocated EVAR/Dike Trail. Inside the perimeter fence on Airport property a new 70-foot-wide Float Plane Pond access road would be constructed to the west of the 2:1 fill slope supporting the RSA. East of the road, a 600-foot RSA would be constructed, and the displaced threshold for Runway 08 would be located at the end of the RSA. The lights comprising the Runway 08 MALSR would have to be shifted to match the eastward threshold displacement.

The combination of Runway 26 threshold relocation and Runway 08 threshold displacement would slightly increase takeoff distance for Runway 08 and would preserve the existing distances for other operations, so no additional weight restrictions would be imposed. Revisions to the special-use instrument approaches for both runways would be required, as would revisions to the Runway 08 public-use instrument approaches. Modifications to some Runway 08 departure criteria may be needed due to the change in Runway 26 threshold (which serves as a waypoint for Runway 08 special departures). Any modification of navigation procedures would need to be reviewed and approved by the FAA prior to their implementation. The displacement of the Runway 08 landing threshold to the east, and resultant modification to the RNAV approach, would improve safety margins since the landing threshold would be located farther from the controlling obstructions at Pederson Hill. Relocation of the Runway 26 threshold to the east could result in penetration of the approach airspace by obstructions along the Gastineau Channel.

Approximately 4.1 acres of Refuge would have to be acquired, transferred, or leased to JNU for implementation of this alternative. An additional 5.0 acres of Refuge land east of the Airport would be disturbed for the construction of the relocated sloughs and tidal channels, including East Runway Slough. Alternative RSA-5E would have the least direct disturbance to the Refuge of any non-EMAS alternative.

Alternative RSA-5E would cost approximately $13.2 million to construct, at a present worth cost of $13.4 million over a 20-year life-cycle. The estimated cost to provide compensatory mitigation for the habitat lost and negatively affected by this alternative is $2.2 million.

RSA-6A: EMAS TECHNOLOGY – EMAS WITH DECLARED DISTANCES/RUNWAY 26 EXTENSION

This alternative, which incorporates the installation of EMAS at both runway ends, was designed to avoid direct disturbance to the Refuge east of the runway and minimize disturbance to the Refuge on the west runway end. The Runway 08 landing threshold would be displaced 188 feet east, but takeoffs would begin from the current departure threshold. The Runway 26 departure

threshold would be located 188 feet east of its current location, while the Runway 26 landing threshold would be at the current location. The existing landing distance would be maintained for both runways, while the takeoff distances would increase about 188 feet in both directions. The Runway 08 MALSR leading to the west end approach would have to be relocated east about 188 feet because of the threshold shift. There would be no need to modify Taxiway A for this alternative.

On the east runway end, approximately 323 feet of new disturbance would be needed to build the additional RSA and EMAS. On the west, Runway 08, end the EMAS would extend to just beyond the current Airport/Refuge boundary by adding about 175 additional feet of RSA embankment, for the EMAS, plus additional disturbance for fill slopes and relocation of the Float Plane Pond access road, security fence, and EVAR/Dike Trail.

RSA-6A would require minor revisions to the published public-use instrument approach and Alaska Airlines' existing special-use RNAV approach to Runway 08. Runway 08 departures, including the Lemon and Fox turning procedures, would be unaffected, and departure runway length would actually increase by approximately 188 feet for both runways. Because the Runway 26 landing threshold would remain unchanged there would be no impact to Alaska Airlines' existing special-use RNAV approach from the east. This alternative would necessitate only minor modification to the Runway 08 MALSR.

The Airport boundary would shift to the west as approximately 1.9 acres of Refuge land would be acquired, transferred, or leased to JNU. Approximately 0.2 acre of Refuge land east of the Airport would be disturbed for the construction of the relocated sloughs and tidal channels, including East Runway Slough.

Alternative RSA-6A would cost approximately $23.1 million to construct, at a present worth cost of $29.6 million over a 20-year life-cycle. The estimated cost to provide compensatory mitigation for the habitat lost and negatively affected by this alternative is $1.58 million.

RSA-6B: EMAS TECHNOLOGY – EMAS WITH DECLARED DISTANCES/RUNWAY 08 EXTENSION

This EMAS alternative was designed to minimize disturbance to wetlands and habitat east of the Runway, but the reduced footprint east of the runway would necessitate a greater disturbance area west of the runway. The Runway 26 landing threshold would be displaced 188 feet west, while takeoffs would begin from the current departure threshold. The Runway 08 departure threshold would be relocated 188 feet west of its current location, but the landing threshold would remain at the current location. The landing distance would be maintained for both runways, while the takeoff distances would increase about 188 feet in both directions. The Runway 08 MALSR would be unaffected by this alternative.

Approximately 135 feet of additional disturbance would be needed on the east runway end to build the remaining RSA and EMAS. On the west, Runway 08, end about 350 feet of new disturbance would be required for the new RSA and EMAS, but embankment construction and relocation of facilities would extend the disturbance footprint another 125 feet. As a

consequence, fill would extend into the Refuge and the east bank of the Mendenhall River, and some material would be dredged from the west river bank to compensate for possible hydrologic changes.

RSA-6B would require no changes to the published public-use instrument approach or Alaska Airlines' existing special-use RNAV approach to Runway 08. Runway 08 departures would begin about 188 feet west of the current threshold, offering a longer takeoff run that would have only minor, if any, positive affect on the Lemon and Fox turning procedures employed by Alaska Airlines, but new procedures would have to be developed and approved. The 188-foot shift in Runway 26 threshold location would also necessitate a revision to and approval for Alaska Airlines' existing special-use RNAV approach from the east. This alternative would require no change to most of the Runway 08 MALSR locations, although the easternmost lights would be converted from stanchions to frangible supports within the new EMAS and safety area prior to the threshold.

The Airport boundary would shift to the west as approximately 8.1 acres of Refuge land would be acquired, transferred, or leased to JNU. An additional 0.2 acre of Refuge land east of the Airport would be disturbed for the construction of the relocated sloughs and tidal channels, including East Runway Slough.

Alternative RSA-6B would cost approximately $25.8 million to construct, at a present worth cost of $32.2 million over a 20-year life-cycle. The estimated cost to provide compensatory mitigation for the habitat lost and negatively affected by this alternative is $1.9 million.

RSA-6C: EMAS TECHNOLOGY – COMBINED EMAS AND RUNWAY SAFETY AREA

This alternative was developed as a means of combining positive features of both standard (1,000-foot-long) RSA and EMAS technology. An EMAS system would be installed on the Runway 08 end, and a standard safety area would be constructed at the Runway 26 end. This alternative would reduce construction and operation costs relative to other alternatives incorporating EMAS at both runway ends, and it would cause no displacement or relocation of runway thresholds. Therefore, no change would be required to landing or departure procedures, and the Runway 08 approach MALSR would be unaffected by this alternative.

On the east runway end, approximately 711 feet of new disturbance would be needed to construct a full, 1,000-foot-long RSA, with an additional 39 feet of fill slope. On the west, Runway 08 end, 350 feet of EMAS and RSA plus fill slopes and relocation of existing facilities would extend the total disturbance footprint to 475 feet. Fill west of the runway would extend into the east bank of the Mendenhall River, and some material would be dredged from the opposite river bank to compensate for possible hydrologic changes.

The Airport boundary would shift to the west as approximately 8.1 acres of Refuge land would be acquired, transferred, or leased to JNU. An additional 4.5 acres of Refuge land east of the Airport would be disturbed for the construction of the relocated sloughs and tidal channels, including East Runway Slough.

Alternative RSA-6C would cost approximately $20.3 million to construct, at a present worth cost of $23.6 million over a 20-year life-cycle. The estimated cost to provide compensatory mitigation for the habitat lost and negatively affected by this alternative is $2.35 million.

RSA-6D: THRESHOLD DISPLACEMENT USING DECLARED DISTANCE CRITERIA WITH OPTION FOR EMAS

This alternative was developed by FAA after publication of the Draft EIS and in consideration of concerns expressed by JNU, CBJ, and others regarding EMAS alternatives. Alternative RSA-6D is a modification of other EMAS alternatives. The alternative would be designed to accommodate the future installation of EMAS at one or both runway ends with no additional disturbance. The operational drawback with this alternative is the landing distance available without EMAS would be reduced to 8,056 feet for each runway, about 400 feet less than existing conditions. With EMAS installed the landing distance for each runway would increase to approximately 8,644 feet.

A difference between this alternative and the west end configurations of other alternatives is that approximately 400 feet of RSA west of the Runway 08 threshold would be constructed to full pavement strength, meaning it would meet design standards for runway. This would ensure that aircraft departing to the east could have as much runway available for takeoffs as currently exists on Runway 08 at JNU. An additional 311 feet of runway safety area would be added to the east runway approach, creating a 600-foot undershoot RSA prior to the Runway 26 threshold. The entire 600 feet of RSA would be constructed at full pavement strength so as to meet design standards for runway use. This would allow departures on Runway 26 to begin at the east end of the RSA and pavement. This alternative does not include extension of the parallel taxiway for departures from either runway. Instead, aircraft that want or need to use the entire available takeoff pavement would be required to enter the runway at either Taxiway B, for Runway 08, or Taxiway G, for Runway 26 and back-taxi to the end of the full-strength pavement before turning 180 degrees to begin their takeoff roll.

Because the landing thresholds would remain in their existing locations there would be no need for changes to the published public-use instrument approaches or Alaska Airlines' existing special-use RNAV approaches. There would be no need to change the Runway 08 MALSR configuration.

Approximately 8.1 acres of Refuge west of the Airport would have to be acquired, transferred, or leased to JNU. An additional 0.2 acre of Refuge land east of the Airport would be disturbed for the construction of the relocated sloughs and tidal channels, including East Runway Slough.

Alternative RSA-6D would cost approximately $11.9 million to construct, at a present worth cost of $12.1 million over a 20-year life-cycle. The estimated cost to provide compensatory mitigation for the habitat lost and negatively affected by this alternative is $1.99 million.

RSA-8: NO ACTION ALTERNATIVE

CEQ regulations require the consideration of a No Action Alternative. While it is the FAA's belief that a No Action Alternative is not practicable, consideration is given to an alternative that essentially maintains existing conditions. In this case, the runway thresholds would be maintained in their present location and a runway length of 8,456 feet would be retained. This alternative would result in RSAs that are deficient by approximately 750 feet at each end and too narrow for more than 40% of the runway length if no action were taken to address the lateral RSA deficiencies.

6.2 NAVIGATIONAL ALIGNMENT

There are two general types of navigational systems, and a range of technologies within those two systems, that could improve pilot alignment with Runway 26 at night and during poor weather. On-the-ground visual landing aids generally consist of enhanced lighting systems that assist the pilot with runway alignment on approach. Applicable on-the-ground systems include:

- high-intensity approach lighting with sequential flashers (ALSF), extending 2,400 feet from the approach end of the runway;
- medium intensity approach light system (MALS), extending 1,400 feet from the approach end of the runway; and
- medium intensity approach light system with runway alignment indicator lights (MALSR), extending 2,400 feet away from the approach end of the runway.

In-the-cockpit navigational aids are procedures and technology available to the pilot to enable alignment of the aircraft on approach to a runway, but without use of additional lighting. The only in-the-cockpit navigational aid found to be potentially applicable for use at JNU is global positioning systems (GPS) and/or flight management systems (FMS). The GPS/FMS use satellite communication technology to ensure the precise position of the aircraft on approach or departure.

The possible alternatives to improve pilot alignment with the runway at night and during poor weather conditions were evaluated for technical feasibility, relative cost, environmental impact, and ability to meet Purpose and Need. The use of ALSF technology would meet objectives, but was dropped from detailed evaluation because of the higher cost and greater construction-related environmental impact than other technology. GPS/FMS technology is not a prudent or feasible alternative because of the high costs, and FAA's inability to enforce system installation and crew training for all aircraft using JNU. The MALS system (without the runway alignment indicator lights) was dropped from detailed evaluation because it would provide much less navigational benefit at only marginally lower cost than the MALSR system.

6.2.1 NAV-2B: MEDIUM INTENSITY APPROACH LIGHT SYSTEM WITH RUNWAY ALIGNMENT INDICATOR LIGHTS (MALSR)

A MALSR would improve operating parameters at JNU by enabling visual alignment with Runway 26 for all aircraft at night and during poor weather. The MALSR would provide a 1/4-

mile lighting credit for the Runway 26 precision approach, allowing Alaska Airlines' minimums to be reduced to 3/4 mile from the current 1-mile minimum. This would result in an estimated 17.5 additional hours of access per year that is otherwise precluded by weather conditions, thus reducing flight delays. The MALSR would also result in much easier alignment for all aircraft approaching JNU from the east at night. FAA has estimated the MALSR as described in this section would cost about $1.5 million using a design that would reduce environmental impacts (by use of an at-grade access road system that would minimize the need for fill and also allow vegetation to re-establish to a more natural surface). Use of a span bridge structure, or additional large arch culverts, to cross the major slough channel would increase the cost somewhat.

The system consists of a series of lights mounted on standards that align with the runway centerline and extend a total of 2,400 feet from the runway threshold. The lights would be positioned at 200-foot intervals, beginning at the Runway 26 landing threshold on the east end of the runway. Based on an RSA layout with 600-foot undershoot protection, the first 600 feet of MALSR would consist of three light configurations mounted either flush with the surface or on low support towers with break-away couplings. The next 1,800 feet of MALSR would include nine light configurations mounted on fiberglass towers. An additional two light towers would be placed on either side of the centerline at 1,000 feet east of the runway threshold; the width of these three towers from one end of a crossbar to the other would be about 70 feet. In total, there would be 14 light support towers, each made of fiberglass and standing from 5 to 20 feet tall (except where the lights are flush-mounted within the RSA), 63 bulbs, and 5 flashers. A small control building, about 10 feet by 14 feet by 10 feet, would also be installed on piles at approximately the midway point of the MALSR system.

A 12-foot-wide at-grade access road would be constructed to properly repair, maintain, and test the system. The access road would be constructed of a geotextile "honeycomb" placed on geotextile fabric and recessed into the ground at least 1 foot. The honeycomb would be filled with granular aggregate, so that the top of the road would be approximately flush with the existing ground surface. The road would allow vehicle passage at tides lower than the road surface, estimated to be no lower than 9 feet mean sea level (msl). Natural vegetation should could take hold through the road honeycomb and help restore the alignment to a more natural function and appearance. Communications and power cables would be trenched and buried adjacent to the road along the centerline of the light towers. Culverts or other water diversion systems may have to be placed just upgradient of any light pads that are located in "drainages," as the separation distance between towers should be maintained at 200 feet if at all possible. A span bridge or large arch culverts would be used to cross the East Runway Slough.

It is estimated that up to 1.4 acres of intertidal estuarine and estuarine emergent wetlands would be disturbed by this project. Up to 1,000 cubic yards of fill material would be needed to construct the road, light maintenance pads, and vehicle turnarounds. This fill would be hauled in by truck from an off-site, permitted borrow source, or obtained from the Float Plane Pond dredging in association with construction of the RSA.

6.2.2 NAV-3: NO ACTION ALTERNATIVE

This alternative would leave the current runway alignment systems unchanged. No operational improvements would be available or implemented to assist in nighttime approaches or with poor weather and instrument approaches to Runway 26. As a result, the frequency of flight delays at JNU would continue unchanged. In accordance with CEQ regulations, this alternative was carried forward for detailed environmental analysis.

6.3 SNOW REMOVAL EQUIPMENT FACILITY (SREF)

The SREF[5] would be designed to store snow removal equipment and provide work space for maintenance on Airport vehicles and equipment. A recently completed Conceptual Design Report for the SREF indicates there are as many as 36 pieces of snow removal equipment, although only 19 of those are "FAA-authorized," meaning they are deemed necessary by FAA to keep the Airport operational (USKH 2004). The minimum amount of snow removal equipment needed at JNU is based on:

- snow clearance time limits for commercial service airports,
- the number of aircraft operations conducted at the Airport,
- the area of runway and other areas to be cleared,
- the facilities maintained on the Airport, and
- weather and snow conditions specific to the Airport.

The Airport Master Plan and Conceptual Design Report provide the detailed justification for a new SREF and sand shed, based on the types and numbers of equipment to be stored and space needed for maintenance, administration, mechanical/heating systems, and so forth. The FAA used this information to evaluate a number of sites for a new SREF with the following standard assumptions:

- a consistent building footprint of 44,616 square feet (ft^2),
- a separate, 12,000-ft^2 building for sand storage, and
- a total facility area of about 6.7 acres.

The design concept for the SREF includes a number of stalls for vehicles and equipment, a large storage area for chemicals such as urea and CG-90, administrative space, a wash bay, and other storage (see Figure 2-33 of the FEIS). The sand storage building would include space for blade and truck storage and an emergency generator. There would also be a refueling station for snow removal equipment and other Airport vehicles. Much of the area around the buildings would be consumed by pavement needed for large equipment to maneuver, turn, and enter and exit the main building. Additional space was added to the design for snow storage and vehicle parking. The entire facility would be fenced.

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[5] For convenience, SREF is used when referring to the combined snow removal equipment and maintenance facility and sand storage shed. Size estimates are based on conceptual design report for SREF developed by USKH for CBJ, 2004.

Ten different locations were considered for construction of a new SREF and maintenance facility (see Figure 2-18 of the FEIS). Each of the alternatives was evaluated for technical feasibility, particularly in consideration of other needed Airport developments, relative cost, possible environment benefits or drawbacks, and ability to meet the Purpose and Need. Other important considerations for this action include impacts on snow-removal response and capability, and whether a site would impede efficient development of other facilities. Two of the sites considered for the SREF were determined to not be feasible because of the presence of other Airport buildings within the needed development footprint, or a lack of development space without significant operational impacts on other Airport tenants and facilities. Other alternatives were considered not prudent, typically due to a number of factors including remote location and degradation of snow removal operations, and possible conflicts with aviation operations.

The FAA relied heavily on those sites that would have the least impact on existing or planned aviation developments, while still providing adequate access to the airfield with little potential for conflict with aircraft movements. As a result, two alternatives were selected for detailed evaluation of environmental impacts: SREF-1B, West End of Airport and East of a Relocated Duck Creek, and SREF-3B1, South of Yandukin Drive. Each of the sites would cost approximately $15.7 million, including design, construction, and compensatory mitigation. The No Action Alternative was also evaluated.

6.3.1 SREF-1B: WEST END OF AIRPORT

This site is located on the east and south banks of a relocated Duck Creek. Although locating the SREF here would allow development of other facilities in the immediate area, ironically, it would also somewhat limit that development as well. The site would have to be sufficiently distant from the north Airport boundary to allow relocation of the creek and accommodate the required stream setbacks. These buffers, combined with the parking and turnaround requirements for large snow removal equipment, would limit the number of hangars or other facilities constructed in the northwest Airport area. Snow removal would probably start at the beginning of Runway 08 and extend east toward the end of the runway. This site could be more expensive to develop than SREF-3B1 if constructed as a stand-alone facility without other airfield operations in the area. Approximately 45,000 cubic yards of fill would be imported from the Float Plane Pond to construct the parking area and SREF and sand shed.

A primary concern with this location is the potential conflict with other airfield development. Snow clearing equipment would have to traverse through an area of hangars and aircraft parking in order to reach the highest priorities for snow removal: the active runway and taxiways.

6.3.2 SREF-3B1: SOUTH OF YANDUKIN DRIVE

This site is located immediately south of Yandukin Drive and would not limit or promote any planned Airport development. Maplesden Way, the short access road to TEMSCO located on the Airport, would need to be re-routed. While minor operational conflicts could arise between snow vehicles and aircraft, the helicopters already operating in this area are typically less active during winter when snow removal operations are conducted. Adequate spacing exists in this area for both large jet aircraft using the main terminal and for aircraft taxiing to and from the runway

system. Conflicts between snow removal equipment and aircraft would be minimized by developing separate service roads from the taxiway system. Snow removal from this location would probably begin at the Runway 26 threshold and extend west toward the runway end. The mostly cleared and leveled location in the Northeast Development Area of the Airport would help to minimize development costs, but reconfiguration of the Yandukin Drive intersection with the TEMSCO access road, and partial relocation of the access road, would add expense. A parking area for employees, vendors, and buses could be located on the east side of the relocated TEMSCO access road. Approximately 40,000 cubic yards of fill would be required for site preparation.

There could be some operational concern associated with this location if the Northeast Development Area is fully developed, as new hangars and aircraft storage and parking would be present. However, there would be little conflict with TEMSCO, as much of the helicopter traffic occurs during the time of year when snow removal is not required.

This alternative is the Proposed Action, selected by CBJ after considerable deliberation and evaluation during the Master Planning process. According to CBJ, this site provided the best compromise between Airport development, cost, and environmental and other factors.

6.3.3 SREF-5: NO ACTION ALTERNATIVE

This alternative would require retaining the current SREF at its present site, in its present condition. Some snow removal equipment and maintenance operations would remain outside. Without the added space to accommodate existing and future equipment, CBJ would continue to experience increased maintenance costs and decreased life expectancy of the snow removal equipment. As a result, delays in responding to snow and ice conditions would continue and would likely increase in the future. Under this alternative, FAA's participation in future equipment acquisition may be jeopardized.

6.4 AIRCRAFT PARKING AND STORAGE

The possible locations for development of new aviation facilities were initially identified in the Master Plan and were evaluated in the FEIS for technical feasibility, relative cost, relative environmental impacts, and ability to meet Purpose and Need. Other important considerations for this action include the ability to meet the airfield facility development objectives, including:

- separate small, general aviation hangars from commercial operations;
- separate rotary aircraft from fixed wing aircraft;
- relieve facility and parking congestion;
- accommodate demand for new and growing fixed-base operations;
- accommodate expansion of existing and new commercial operators; and
- incorporate facility design flexibility into the layout to accommodate shifting needs as well as space required for snow storage.

Initial efforts to develop alternatives distinguished between fixed wing facilities and rotary wing facilities, with the possibility of achieving complete separation of the two in accordance with desirable Airport layout principals. In addition, alternatives were considered that would avoid some habitat loss and environmental impact by limiting new airfield development to one area of the Airport. Five alternatives were initially considered (plus the No Action Alternative). However, during the EIS planning and forecast validation efforts FAA determined that neither of the two main undeveloped lands on the Airport (known as the Northeast Development Area and Northwest Development Area) could provide sufficient space to accommodate forecast demand without some development in the other area.

One off-Airport site, at Miller-Honsinger Pond, was evaluated but involved a number of technical and operational constraints. The Pond is far from the rest of the Airport, new infrastructure would have to be developed including new access roads and taxiways, and large amounts of fill would be needed to render the site ready for development. Importantly, the Pond is not owned by CBJ, and since the Airport currently has sufficient land available for development, there is no compelling need to expand the property boundaries to incorporate the Pond.

Only two alternatives, each making use of both large undeveloped areas remaining on the Airport grounds, would meet the existing and forecast demands for space and aviation facilities. These alternatives would also meet the facility development objectives. Alternatives FW/RW-1 and FW/RW-2, as well as the No Action Alternative FW/RW-3, were subjected to a detailed environmental analysis in the FEIS. Conceptual layouts designed to meet the aircraft storage and parking needs and Airport layout objectives were prepared for aviation facilities in the Northeast and Northwest Development Areas in accordance with the FAA criteria specified in Advisory Circular 150/5300-13 Airport Design, Advisory Circular 150/5390-2B Heliport Design, and Federal Aviation Regulation (FAR) Part 77 Objects Affecting Navigable Airspace. These layouts are shown in Figures 2-34, 2-35, and 2-36 of the FEIS. The two alternatives would each cost between $19 and $20 million, including compensatory mitigation funding and depending on final facilities layout. The following subsections summarize the two action alternatives and the No Action Alternative, prefaced by a description of the common development layout shared for the Northeast Development Area.

6.4.1 NORTHEAST DEVELOPMENT AREA (ALTERNATIVES FW/RW-1 AND FW/RW–2)

Both of the alternatives for aviation facilities include the same general layout for the Northeast Development Area. The objectives in this area are to accommodate expansion of commercial aviation facilities (including fixed-based operators and helicopter tour operators), large maintenance/storage hangars, and construction of a new SREF. Adequate space was allocated in the layout to accommodate the projected development requirements of one major tour operator and expansion of other operations. A suitable area for relocation of a fixed-base operator, currently housed in a building directly east of the passenger terminal complex, was incorporated within the south-central portion of the site and would include adequate space for large hangar development, tie-down apron, and taxilane access.

Each of the commercial aviation facilities specified to be incorporated in the Northeast Development Area would restrict or limit vehicular access onto the aircraft operating areas. Sufficient auto parking areas are to be incorporated into the various site development plans. This conceptual layout for the Northeast Development Area would meet the projected needs for helicopter facilities and commercial operations identified in Table 1-2 of the FEIS. The SREF would be constructed on approximately 6.7 acres in the northeast corner of the Northeast Development Area.

Vehicles would reach the facilities in this area via a new road extending southward from Yandukin Drive. This road would provide direct public access to the parking lots for the various commercial aviation companies. The future buildout within the Northeast Development Area would necessitate relocation of the Remote Communications Outlet (RCO), Automated Surface Observation System (ASOS), and other FAA equipment. Some of the equipment from these facilities would be relocated to the Engineer's Cut. A few items, including the air traffic information service radio facility and the VHF omni-directional range test transmitter, would need to remain in close proximity to the runway. The ASOS would be relocated to a site southeast of TEMSCO and just north of the parallel taxiway.

Approximately 24.8 acres would be disturbed by either of the two action alternatives in the northeast Airport area, including approximately 19.8 acres of wetlands.[6] Some of this has already been disturbed for facilities, including the RCO and the access road to TEMSCO. However, other portions of the area consist of estuarine wetland habitat. It is estimated that 133,500 cubic yards of fill would be needed to raise the elevation above tidal influence, to approximately the level of the Delta One ramp, and provide a suitable support base for the facilities.

FW/RW-1: Full Development of Northeast and Northwest Development Areas

Because a substantial portion of fixed wing aircraft uses occur on the west portion of the Airport, the Master Plan recommended that additional fixed wing aircraft parking for based aircraft occur on the northwest area along with new T-hangars and executive hangars. Fixed-based operators and other commercial tenants would, to the extent practicable, be concentrated in the Northeast Development Area (as described in the previous section).

The existing Duck Creek channel presents a barrier to the Airport expansion in the northwest portion of the Airport, in that new facilities (including hangars, parking, and taxiways) cannot be easily integrated into the existing layout. The Northwest Development Area would include a dual taxilane access bridge crossing Duck Creek.[7] FAA standards for this design require that the taxilanes be at least 35 feet wide and that there be at least a 97-foot separation between the two taxilanes, as measured from centerline to centerline (see AC 150/5300-13: Table 2-3). Hangars would offer either north- or south-facing doors, and tie-down areas would be oriented in an east-west configuration, with parked aircraft generally facing south.

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[6] These numbers do not include the area set aside for a SREF. Total disturbance including the SREF in the NE Development Area would be about 31.5 acres, requiring 173,680 yards of fill.

[7] The number of access taxiways that are required to adequately serve an aviation development area is dictated by the total number of aircraft that would be taxiing to and from the runway facility, and not the aircraft size. It should be noted that the future hangar development area would be initially served by just one bridge crossing during the early development timeframe.

Vehicle access to this area would be via both Radcliffe Road and the unnamed Airport access road. A segment of the EVAR/Dike Trail would be relocated, with a link to a new auto parking area with the existing trail via a new pedestrian footbridge crossing Duck Creek. There would be an approximately 50-foot development setback/buffer zone on either side of the Duck Creek centerline. Bottomless arch culverts, bottomless box culverts, or a span bridge would be installed at the new fuel farm road crossing over Duck Creek, if approved. JNU would also remove the existing culvert at Radcliffe Road that was to have been removed as a condition of permit approval for a previous action.

Approximately 17 acres would be disturbed by the proposed development in the Northwest Development Area, most of which is currently undeveloped. The habitat to be disturbed includes approximately 5 acres of wetlands. It is estimated that 67,240 cubic yards of fill would be needed to raise the elevation above tidal influence and provide a suitable support base for the facilities.

FW/RW-2: FULL DEVELOPMENT OF NORTHEAST AND NORTHWEST DEVELOPMENT AREAS WITH DUCK CREEK RELOCATION

This alternative also includes development of the northeast and northwest Airport areas for aviation facilities, and the conceptual design for the Northeast Development Area would be as described previously. Objectives for development in the Northwest Development Area are the same as for Alternative FW/RW-1. The major difference from alternative FW/RW-1 is this alternative would include relocation of most of lower Duck Creek, including that portion on the Airport and west of the Airport on the Refuge.

This alternative relocates the existing Duck Creek channel that currently presents a barrier to efficient Airport expansion in the Northwest Development Area. This action would open space to meet virtually all of the projected needs for executive hangars, T-hangars, and tie-downs. The Civil Air Patrol hangar would remain, but future development could include replacement to orient a new building with the remainder of the airfield.

FAA standards for this layout require that the taxilanes be at least 35 feet wide and include a 115-foot taxilane object-free area width (see AC 150/5300-13: Table 4-1). Hangars would offer either north- or south-facing doors, and tie-down areas are to be oriented in a north-south configuration, with parked aircraft generally facing east.

The portion of Duck Creek to be relocated would begin near the intersection of Cessna Drive and the unnamed Airport road and extend westerly along the northern Airport boundary to a new discharge point in the Mendenhall River. A 50-foot development setback/buffer zone would be established on both sides of the Duck Creek centerline. The relocation of about 2,600 feet of Duck Creek would allow a more integrated design between new facilities and the existing Airport layout. The Airport security fence would be placed between the newly aligned Airport road and the creek, which would remain accessible to the public from the north.

Vehicles would reach the aviation facilities via realignment and extension of the unnamed Airport access road. The new roadway would be located on the south side of the realigned segment of Duck Creek and would connect with the existing Airport-controlled access road that

extends around the west end of Runway 08. New auto parking areas would be developed as needed on the south side of the new roadway to serve airport users. As with the other alternative, a portion of the EVAR/Dike Trail would be relocated, and a new parking area would be developed for trail users.

Approximately 17 acres would be disturbed in the Northwest Development Area. However, the net gain in wetlands in the Northwest Development Area due to relocation of Duck Creek is estimated at 3.6 acres. The proposed development would be at an elevation of approximately 19 feet above msl; an estimated 87,000 cubic yards of fill would be needed to raise and level the surface to that elevation. A bottomless arch culvert, bottomless box culvert, or span bridge would be installed at the new fuel farm road crossing over Duck Creek, if approved, and a pedestrian footbridge would span the creek where the Dike Trail crosses, near the Airport's western boundary. The existing pipe culvert at Radcliffe Road would be removed. The area north and south of the new outlet of Duck Creek on the Mendenhall River would be graded and a berm would be placed along the northern edge of the grading to stabilize the new channel. Although this design should be sufficient to maintain the location and design of the new Duck Creek outlet, it may prove necessary to add additional armoring of the creek banks near the outlet. This could be accomplished with traditional riprap or bioengineering techniques.

The relocation of Duck Creek would benefit the Airport layout and would also provide an opportunity to improve certain stream characteristics and aquatic functions, particularly improving conditions for fish migration. The relocation design would include features such as natural substrates, revegetated banks, a somewhat shortened channel, and an impermeable bed (to help maintain stream flows currently lost through seepage to groundwater). The improvements incorporated into this project are consistent with recent studies (cf. U.S. Fish and Wildlife Service [USFWS] 2002). The primary objectives would be to reduce or prevent water loss, facilitate the upstream movement of adult and juvenile fish to rearing and spawning areas, and to speed the downstream movement of juveniles to summer rearing areas in the estuary. In general, the concepts for Duck Creek realignment presented in Section 2.8.2.3 of the FEIS would address most of the major problems identified for this reach of the creek in the Duck Creek Watershed Management Plan.

FW/RW-3: NO ACTION

This alternative would not satisfy existing and future aviation needs. The likely result would be that aircraft operations would still increase and parking would become increasingly congested until JNU and FAA determined that unsafe conditions would arise. Additional effort would be expended by Airport staff and tenants to move aircraft as needed but it would become increasingly difficult to operate either safely or efficiently. It would also become impossible with further growth to meet Airport Design standards, established to provide adequate aircraft clearance from other aircraft and ground support equipment. The lack of new facilities would prevent CBJ from gaining additional revenue at the Airport, such as that received from tie-down rentals and hangar/apron leases.

6.5 FUEL FARM ACCESS

The bulk fuel storage tanks (known collectively as the "fuel farm") at JNU are located on the northwest side of the Airport, west of Alex Holden Way and Duck Creek. Few alternatives were available to address the needs associated with vehicles heavier than the allowable road capacity, Airport security and public safety concerns, and efficiency of refueling operations. It is not feasible to relocate the fuel farm due to space limitations on the Airport and siting safety constraints for petroleum storage tanks. One alternative initially considered, to purchase new fuel vehicles that are designed to meet load requirements for public thoroughfares, was eliminated from detailed consideration because it would not satisfy the safety and security needs; in other words, the fuel trucks would still have to exit and enter Airport property twice on each trip and use public roads in transit. Two alternatives, for a new fuel farm road and a fuel pipeline with service station, were found to be both prudent and feasible and, along with the No Action Alternative, were fully evaluated for environmental impacts in the FEIS. These options are shown in Figures 2-19 and 2-36 of the FEIS.

6.5.1 FF-1: DEVELOP NEW ACCESS ROAD TO FUEL FARM

A new access road would be constructed to exit the south side of the fuel farm site, trending approximately southwest along the Airport property line and turning south toward the Airport apron. The road would cross Duck Creek and connect to the aircraft apron in the vicinity of Taxilane W-2. Using this route, the fuel farm could be reached without having to travel on public roads or exit from the secure Airport perimeter. The estimated cost to develop the new access road is $302,998.

The new road would consist of two lanes, each 12 feet wide, with an adjacent 2-foot shoulder on each side. Runoff from the road surface would be captured by vegetated drainage channels located adjacent to the shoulders. The road would be paved with asphalt and underlain by select graded gravels and a base of borrow material, meeting CBJ construction standards and suitable for the vehicle types and weights to be transported. A bottomless arch culvert, bottomless box culvert, or span bridge would be installed at the Duck Creek crossing. To reduce the culvert length, and therefore reduce impacts to the riparian corridor and aquatic life, the road width would be narrowed to a 16-foot, single-lane crossing for approximately 30 feet. The culvert diameter would be sized according to the width of stream channel crossed. The new road would extend approximately 565 feet from the fuel farm to Alex Holden Way.

There are many operational, safety, and security benefits associated with a new road. The new location would save approximately 450 feet of total travel distance in each direction. The new road would be within the Airport fence line, so public traffic would not be allowed. Also, the new road would reduce transport time for the refueling trucks, since there would be no security gates and a shorter travel distance to Taxilane W-2, leading on to the general aviation apron. An additional security and safety benefit would be incurred by reduction of travel through the existing Gate E, where tanker trucks require a delayed gate-closing system to ensure trucks clear the opening. There would be environmental concerns associated with this alternative, particularly development of another Duck Creek crossing, and removal of some upland and wetland habitat.

However, there may also be an environmental benefit incurred by reduced accident potential and reduced operations proximal to Duck Creek.

A bridge could be used in place of a bottomless arch culvert and achieve some relatively minor reduction in fill and environmental impact. The bridge would raise the cost to about $374,364 based on a unit rate of $186 per square foot. Approximately 0.23-acre would be disturbed, including some palustrine scrub-shrub wetlands. Approximately 2,000 cubic yards of fill would be required for road construction.

6.5.2 FF-2: INSTALL PIPELINES FROM FUEL FARM TO CENTRAL FUEL DISTRIBUTION PORT

An alternative identified by the cooperating agencies would be to bury a fuel distribution pipeline extending from the fuel farm to a central refueling station on the Airport. The refueling station could be located just south of an unnamed Airport road and would be used by tanker trucks that service aircraft. This alternative was developed to reduce environmental impacts associated with construction of a new fuel farm road and another Duck Creek crossing. It would also increase operational efficiency by further reducing the travel distance for airfield refueling trucks. The estimated cost to develop a new fuel pipeline and refueling system is $721,726. If directional drilling were used to install the fuel pipes the cost would increase to an estimated $1.2 million.

The advantages of a pipeline system are similar to those for a new fuel farm access road: increased security and public safety and more efficient operations because of reduced travel distance and time. A pipeline system would further reduce transport distance for the refueling trucks, as they would take on aviation gasoline (a product known as "AvGas") or jet fuel at a new service station located just south of the unnamed Airport road and adjacent to Taxilane W-2. However, development of a fueling station in this area would occupy space that may otherwise be dedicated to aircraft parking.

The pipeline system would follow approximately the same path as the fuel farm road. There would be multiple pipelines since the products, such as AvGas and jet fuel, have to be separated by type, grade of fuel, and vendor and to allow fuel metering at the service station (FAA 1982). Based on the types of fuels currently stored at the fuel farm and different formulations of those fuels, six separate pipelines would be required for existing demand and projected future uses. This includes the possibility of one pipeline dedicated to de-icing compounds. Additional contingency pipes could be added to the system at construction to anticipate other fuel types or vendors. These separate pipelines would be contained within a larger pipe to provide structural support, protection against damage from subsurface digging or drilling operations, and secondary containment in the event of leaks from a pipe.

The service station would be located in an area already disturbed and used for aviation facilities. The station would most likely consist of a series of pumps associated with each of the different AvGas, jet fuel, and possibly de-icing products. Meters would be installed to monitor how much product is pumped by each truck. Individual vendors using the station would have access cards or pass codes to begin pumping. An approximately 50-foot clear zone would be developed

around the service facility, and it may also be fenced as an added security precaution. Other requirements specified in such applicable regulations as the International Fire Code and National Fire Protection Association code would be applied, including the presence of emergency disconnect switches.

The product pipelines would most likely be installed by conventional trenching methods rather than directional drilling. The trench would be cut to below the subsurface frost zone to reduce potential for soil heaving. The trench would also be lined with graded material to prevent differential settling and unnecessary strain on the secondary pipeline. Support bases or brackets may be used to further anchor the system. Precautions would have to be taken during installation of the pipeline below Duck Creek. Ideally, trenching would occur during a period of low tides and low precipitation, to reduce the amount of in-stream flows that would have to be temporarily redirected. Screens and barriers would be used to prevent sediment disturbance and degradation of water quality. Alternatively, the pipelines could be installed during relocation of the creek to avoid any trenching in an active channel.

A significant concern with buried pipelines is leak detection. Automatic sensors can be installed to monitor pressure within the individual pipes, and the meters at the service station can be used to compare amount of product pumped vs. the amount of product leaving the bulk storage tanks. In the event of a leak there should be no disruption to supplies for aviation operations, as the leaking pipeline would be isolated or, if the specific line could not be determined and the entire system had to be shut off, fuel trucks could always travel to the fuel farm until pipeline repairs are made. However, the automatic systems are not able to detect relatively low pressure drops, as could occur with a small leak. A substantial amount of product could be lost before leaks are detected or differences between the product pumped vs. product delivered are noticed. Even small leaks of petroleum compounds can have significant impacts on groundwater. Duck Creek could also be affected by subsurface contamination as it is recharged by groundwater under certain conditions.

About 2/3 acre would be disturbed during trenching and installation of the pipelines, but there would be no net loss of habitat as the construction path would be reclaimed. No fill material would be necessary although some select gravel and sand may be placed just under the pipes for stability.

6.5.3 FF-3: NO ACTION ALTERNATIVE

The No Action Alternative would retain the fuel farm access as it exists today with no change in route or entrance or exit location. Vehicles would exit the fuel farm to the east, travel on Alex Holden Way, and enter the Airport Operations Area through security gates. This alternative would require operators of the tankers to obtain street licenses for these vehicles, and it could force the operators to acquire different tankers to meet street vehicle requirements.

6.6 WILDLIFE HAZARD MANAGEMENT PLAN

CBJ's revised WHMP includes a number of habitat modifications to reduce and control wildlife potentially hazardous to aviation (CBJ 2002). Collectively, the habitat modifications from the

WHMP, with some modifications identified by CBJ in communications and correspondence during development of the EIS, represent the Proposed Action for wildlife hazard management. The WHMP also describes hazard control procedures, wildlife monitoring requirements, staff training requirements, and the basis for program evaluation. However, the labor and funding to support these programs, or the level of activity within each, is generally not defined. In order to develop a range of alternatives, other hazard reduction options involving habitat modification or hazard control (i.e., hazard repellent) techniques were identified for the EIS. The proposed actions and hazard reduction options were reviewed for effectiveness and ability to be implemented. Some options, such as filling the Float Plane Pond, were deemed not prudent or practicable, in part because of their affect on airfield operations. Others, such as installation of wire gridding over surface water to prevent birds from feeding on schooling fish, were deemed not prudent for the desired application. Section 2.5.3 of the FEIS describes each of the possible options considered.

Each option considered prudent and feasible for reducing wildlife hazards were organized into one or more wildlife hazard management alternatives and included for detailed environmental analysis in the EIS. Each of the alternatives, other than the No Action Alternative, has the potential to alleviate specific wildlife management concerns and achieve, at least in part, some reduction in wildlife hazard created by the issues listed in Table 3. The three action alternatives are estimated to achieve varying degrees of hazard reduction based on the extent of habitat modification. It is reasonable to expect that wildlife control activities would increase with lesser habitat modification, so that JNU can effectively maintain risks to a level deemed acceptable. The fourth alternative considered, the No Action, would continue the existing effort at wildlife hazard mitigation at JNU. Table 3 also identifies the individual components of each of the four alternatives.

Section 2.9 of the FEIS includes a detailed description of each alternative. The following subsections provide summary information for each alternative along with key differentiators between alternatives.

6.6.1 WH-1: WILDLIFE HAZARD MANAGEMENT PLAN AND SPONSOR'S PROPOSED ACTION

The Sponsor's proposed wildlife hazard control actions for specific species and areas of the Airport were initially described in the WHMP. During development of the EIS and as a result of numerous discussions with agency staff, wildlife experts, and the EIS consulting team, the Sponsor modified the proposed action to eliminate some habitat modifications and incorporate other actions, shown in Table 3. Section 2.9.1 of the FEIS contains a description of all elements of this alternative. This alternative would disturb approximately 233 acres, including paving about 77 acres of grass infield, and removing vegetation from up to 83 acres of Float Plane Pond. An estimated 501,500 yd^3 of fill would be needed. The estimated total cost for this alternative is $21.9 million, of which about $1.67 million would be compensatory mitigation for wetland and habitat loss. The estimated annual labor and materials cost associated with this alternative is $86,000, an increase of about $55,000 above that spent in 2003. This estimate includes an additional 1/4-FTE for wildlife hazing and education, $20,000 in vehicle costs, and $10,000 for supplies such as shells, mortars, and so forth.

Table 3. Habitat Modifications for Wildlife Hazard Management Alternatives

Wildlife Hazard Issue	Alternative WH-1[1] JNU's Proposed Action	Alternative WH-2[2] Moderate Habitat Modification	Alternative WH-3[3] Minor Habitat Modification & Adaptive Hazard Management	Alternative WH-4[4] No Action
a. Birds Attracted to Vegetated Areas near Runways and Taxiways	WH-1a Pave grassed infield areas	WH-2a Install synthetic ground cover in the infield	WH-3a Grade infield areas to prevent water from ponding; alter vegetation management practices to attract fewer wildlife; increase hazing	WH-4a Continue Existing Hazard Management Program
b. Birds Attracted to Wetlands on West Portion of Airport Property	WH-1b Fill on-Airport wetlands west of runway to above high tide, at level of Northwest Development Area	WH-2b Regrade on Airport areas by selective dredging and filling to eliminate ponds, channels, and swales that capture water	WH-3b Increased hazing of wildlife using control technologies	
c. Birds Attracted to Wetlands on Refuge West of Airport Property	WH-1c Fill of wetlands on Refuge west of JNU, creating free draining surface to Mendenhall	WH-2c Regrade area by selective dredging and filling west of JNU to eliminate ponds, channels, and swales that capture water	WH-3c Increased hazing of wildlife using control technologies	
d. Birds Feeding on Fish Staging at the Mouth of Duck Creek	WH-1d Relocate Duck Creek beginning at Airport Gate 'E' to the mouth, away from Alex Holden Way to north JNU boundary, discharge at former Gute property	WH-2d Relocate limited reach of Duck Creek, from Radcliffe Road, to create new channel trending west to Mendenhall River	WH-3d Increased hazing of wildlife using control technologies	
e. Birds Attracted to Surface Water Conveyances on JNU	WH-1e Convert drainage ditches into underground drains, install treatment	WH-2e Regrade and line ditches with concrete or other synthetic material, install treatment	WH-3e Regrade and manage vegetation, with increased hazing	
f. Birds Attracted to Swales that Collect Rainwater	WH-1f Remove swales and areas along pavement edges that collect water, regrade to RSA	WH-2f Same as WH-1f	WH-3f Same as WH-1f	

Table 3. Habitat Modifications for Wildlife Hazard Management Alternatives

Wildlife Hazard Issue	Alternative WH-1[1] JNU's Proposed Action	Alternative WH-2[2] Moderate Habitat Modification	Alternative WH-3[3] Minor Habitat Modification & Adaptive Hazard Management	Alternative WH-4[4] No Action
g. Ducks and Waterfowl Feeding on Float Plane Pond Vegetation	WH-1g Mechanically remove vegetation from Float Plane Pond and fingers using dredges or other means	WH-2g Fill In Float Plane Pond fingers to eliminate waterfowl habitat	WH-3g Increased hazing of wildlife, elimination of hunting program	
h. Birds Feeding on Fish at Mouth of Jordan Creek	WH-1h Remove dam at mouth of Jordan Creek	WH-2h Same as WH-1h	WH-3h Same as WH-1h	
i. Woodland Habitat Providing Perch and Nest Sites, and Wildlife Cover	WH-1i Selectively thin trees, clear understory, and install deer fence	WH-2I Periodically remove Corvid nests and install deer fence	WH-3i Increased hazing of wildlife using control technologies, adaptive management program as needed through Advisory Board consultation	

[1] Some increased labor effort and supplies would be needed for WH-1, but less than for other action alternatives. See Section 2.9.1.

[2] Increased labor effort and supplies would be needed for WH-2, more than WH-1 but less than for WH-3. See Section 2.9.2.

[3] Increased labor effort and supplies would be needed for WH-3, most of any action alternatives. See Section 2.9.3.

[4] No Action Alternative means no change from existing conditions for that specific habitat modification or hazard abatement action.

6.6.2 WH-2: MODERATE HABITAT MODIFICATION ALTERNATIVE

This alternative, fully described in Section 2.9.2 of the FEIS, also incorporates a number of habitat modifications, although with more emphasis on hazard control than WH-1. There would be less habitat alteration than the Proposed Action since no trees and understory would be removed from the Float Plane Pond woodlands, and the main body of the Float Plane Pond would remain undisturbed. This alternative would also eliminate grass from the Airport infield, but it would be replaced with a synthetic turf product. In addition, the Float Plane Pond fingers would be filled to remove waterfowl habitat. This alternative would disturb approximately 116 acres and require about 462,500 yd^3 of fill. The estimated total cost for this alternative is $28.6 million, of which about $1.25 million would be compensatory mitigation for wetland and habitat loss. The estimated annual labor and materials cost associated with this alternative is $101,000, an increase of about $70,000 above that spent in 2003. This estimate includes an additional 1/2-FTE for wildlife hazing and education, $20,000 in vehicle costs, and $10,000 for supplies such as shells, mortars, and so forth.

6.6.3 WH-3: MINOR HABITAT MODIFICATION ALTERNATIVE WITH ADAPTIVE HAZARD MANAGEMENT PROGRAM

This alternative was developed in response to numerous concerns raised during scoping, including:

- long-term effects of increased habitat reduction on and near the Airport;
- the need to reduce risks to aircraft using methods available that would cause the least impact to habitat;
- potential effects of habitat modifications on species of little concern to aviation safety; and
- a recommendation that adaptive habitat management be undertaken to initially try hazard control methods with the least environmental impact.

Alternative WH-3 emphasizes hazard control through the use of increased labor, training, and hazing. An adaptive hazard management approach would be used to provide a framework for adjusting management actions by monitoring hazard control activities and success, and making alterations using different degrees or types of hazard control and, potentially, increased habitat modification. Central to this approach would be the use of a wildlife hazards working group to include Airport staff, wildlife professionals, resource agencies, and members of the community to provide multi-disciplinary and objective review and recommendations. This alternative would also require changes in the way vegetation (grassed infields, other open space) is managed to reduce wildlife attractants and elimination of the on-Airport hunting program. Alternative WH-3 is fully described in Section 2.9.3 of the FEIS.

This alternative would disturb approximately 33 acres and require about 13,000 yd^3 of fill. The estimated total cost for this alternative is $1.2 million; no compensatory mitigation funding should be required. The estimated annual labor and materials cost associated with this alternative

is $140,000, an increase of about $109,000 above that spent in 2003. Much of the additional labor cost would result from the employment of a full-time wildlife control officer.

6.6.4 WH-4: NO ACTION ALTERNATIVE

This alternative would result in no changes to the Airport and near-Airport habitat for the purposes of wildlife hazard control. The existing hazard management program would remain in place, with no increase in staff or funding.

7.0 ENVIRONMENTALLY PREFERRED ALTERNATIVES

For all actions, the No Action Alternative for each need is considered to be the environmentally preferred alternative. The CEQ 40 Most Asked Questions, Question 6a, defines the environmentally preferred alternative as "the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural and natural resources." FAA's guidance directs the approving official to select as the environmentally preferred alternative the one that, with mitigation, would (FAA 2006):

1. Promote the national environmental policy NEPA describes;
2. Cause the least damage to the natural, biological, and physical environment; and
3. Best protects, preserves, or improves historic and cultural resources.

Although the FAA finds that the actions comprising the preferred alternatives, as identified in Section 2.13.2 of the FEIS, incorporate all practicable measures to minimize harm from significant adverse environmental impacts, the FAA recognizes that the No Action Alternatives for each action would impose the least environmental impacts. However, the No Action Alternatives do not satisfy the expressed Purpose and Need for each action.

The following represent the environmentally preferred alternatives that do satisfy Purpose and Need for the actions:

1. Alternative RSA-6A, Installation of EMAS with Declared Distances and Extension of Runway 26, is the environmentally preferred alternative to bring the Airport into compliance with FAA's standards for runway safety area. Although this alternative would cause the least overall environmental disturbance and minimize adverse impact to the Refuge, wetlands, and essential fish habitat (EFH), the high implementation and maintenance cost preclude its selection. (The following section, Section 8.0, of the ROD provides more explanation of FAA's statutory obligation with respect to selection of an RSA alternative for JNU.)
2. Alternative NAV-2B, Installation of a MALSR, is the environmentally preferred alternative to improve pilot alignment and create safer landing conditions at night and during poor weather.
3. The alternatives for a new snow removal equipment and maintenance facility would have relatively comparable environmental impact. SREF-3B1 would directly affect more wetlands and wildlife habitat, while SREF-1B would affect a greater amount of EFH and have a higher potential to affect cultural properties.
4. Alternative FF-1, Construction of a new Fuel Farm Access Road, is the environmentally preferred alternative to create safer traffic conditions and increase airfield efficiency. This alternative would have a slightly smaller disturbance footprint than installation of fuel pipelines, and have a lower potential to encounter cultural properties or buried hazardous wastes.

5. Alternative FW/RW-2 is the environmentally preferred alternative to increase aviation facilities and apron space. The alternatives considered to satisfy these needs would have relatively comparable disturbance footprints; however, the relocation and reconstruction of Duck Creek, incorporated into FW/RW-2, would create benefits to fish passage and water quality, and result in lower net losses of wetlands and EFH. In addition, riparian functions and flood control would also improve with this alternative.
6. The wildlife hazard management alternatives were created to make use of distinctly different hazard control techniques for some areas of the Airport. Alternative WH-3 relies almost entirely on increased hazard management – more staff, hazing, education, and adaptive management – and little habitat modification. This alternative is therefore the environmentally preferred. However, FAA does not believe that the control techniques incorporated into WH-3 would sufficiently reduce risks to achieve the need without additional habitat modification. As a result, FAA's preferred alternative (described in the following section) represents a combination of alternatives.

8.0 FAA'S PREFERRED ALTERNATIVES

The mission of FAA's Airports Program is to provide leadership in planning and developing a safe, efficient national airport system to satisfy the needs of the aviation interests of the United States. In accomplishing this mission, the Airports Program will safeguard public investment and consider economics, environmental compatibility, and local proprietary rights. FAA's preferred alternatives for JNU are consistent with the mission of the Airports Program.

Each of the alternatives for each action carried forward for detailed analysis in the EIS was evaluated for its ability to meet relevant statutory considerations and the Purpose and Need for each action. The FAA carefully considered public comment and testimony offered during scoping, as well as during meetings and hearings for the Draft and Final EISs. Reasoned and expert advice from state and federal agencies was continually factored into the development and evaluation of alternatives. During the EIS the Sponsor modified some of the proposed actions specifically to satisfy environmental concerns expressed by FAA, the public, and agencies.

The FAA's preferred alternatives are those identified in Section 2.13.1 of the FEIS. These alternatives are consistent with the Sponsor's proposed actions, although FAA has incorporated additional design features and other elements in most alternatives to reduce environmental impacts. The following sections summarize FAA's rationale for selecting each of the preferred alternatives. Differences between the Proposed Actions descriptions and the Preferred Alternatives are noted.

8.1 RUNWAY SAFETY AREA

In 2006, Congress passed and the President signed Public Law 109-443 to the National Transportation Safety Bill. Portions of this law address the proposed runway safety area improvements at JNU and provide explicit direction to FAA concerning which alternative is preferred for implementation. Specifically, Public Law 109-443 states that "…the Secretary of Transportation may only select as the preferred alternative the least expensive runway safety area alternative that meets the standards of the Federal Aviation Administration and that maintains the length of the runway as of the date of enactment of this Act." In determining the least expensive runway safety area alternative, "…the Secretary shall consider, at a minimum, the initial development costs and life-cycle costs of the project."

Public Law 109-443 provides clear direction to the FAA for selection of the preferred runway safety area alternative. The FAA's selection of an alternative is critical to the Juneau Airport's ability to implement required runway safety area improvements in several respects. Because FAA is the lead federal agency for the proposed actions and will provide federal monies to fund most of the cost associated with RSA construction, the Airport could not be reasonably expected to fund any alternative other than a No Action Alternative without FAA's financial assistance. The FAA's role in funding decisions is critical, as Congress has placed sole responsibility on the FAA to approve use of federal Airport Improvement Program funds for airport improvement projects. In addition, the FAA has sole authority to approve the Airport Layout Plan depicting the proposed RSA improvements as well as the Airport's operating certificate under Federal

Aviation Regulation Part 139. Whether for purposes of funding approval or approval of airport layout, the FAA cannot approve the Airport's Layout Plan or the Airport's operating certificate unless a runway safety area alternative were constructed that comports to Public Law 109-443. Therefore, an alternative not complying with Public Law 109-443 is not available to the Airport for implementation. The FAA has determined that RSA-5E conforms to Public Law 109-443 and has, therefore, designated Alternative RSA-5E as the preferred alternative.

The high cost of Alternatives RSA-6A and RSA-6B exceed FAA's RSA costing thresholds. Alternative RSA-6D is not practicable because it conflicts with federal statute prohibiting a reduction to the runway length. In addition, none of these alternatives are practicable according to the Clean Water Act Section 404(b)(1) guidelines because they are unavailable for implementation.[8] FAA therefore concludes that the selected alternative, RSA-5E, complies with the requirements of the 404(b)(1) guidelines with the inclusion of appropriate and practicable discharge conditions included in this ROD and as part of the conditions of various permits, including the U.S. Army Corps of Engineers' (USACE's), to minimize pollution or adverse effects to the affected aquatic ecosystems. FAA therefore believes that RSA-5E is the least environmentally damaging practicable alternative.

FAA has determined that the least expensive runway safety area alternative that maintains the length of the runway and satisfies statutory requirements is RSA-5E, the Sponsor's Proposed Action and FAA's Preferred Alternative. Figure 3 illustrates the disturbance footprint and facilities to be relocated with construction of the additional runway safety area. The Runway 08 threshold would be displaced 120 feet east of its existing location, and the Runway 26 threshold would be relocated 520 feet east of its existing location. Sufficient development of RSA would be constructed at both runway ends to meet FAA standards of 600-foot undershoot protection. The runways would be marked and designated in the Alaska Supplement to the Airport/Facility Directory and the Airport Layout Plan to provide for 1,000-foot aircraft overrun protection. The Runway 08 MALSR would be adjusted through a 120-foot eastward shift in accordance with the threshold displacement. To prevent impairment of commercial navigation in the Mendenhall River potentially caused by placement of one or more of the 1,000-foot light towers within the river channel, FAA shall require that the navigable portion of the river channel not be reduced in the Runway 08 approach light lane.

FAA's Preferred Alternative incorporates a number of features to reduce and minimize environmental impacts. These features are listed in the alternative description in Section 2.11 of the FEIS. Additional conditions of approval to minimize environmental harm that would apply to this and other preferred alternatives are identified in Section 12.2.3 of this ROD. Also, mitigation requirements identified in Section 12.0 of this ROD and those incorporated into the final compensatory mitigation plan would be adhered to.

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[8] See later section on Compliance with Laws, Regulations and Orders, and the analysis of compliance with the Clean Water Act Section 404(b)(1) guidelines.

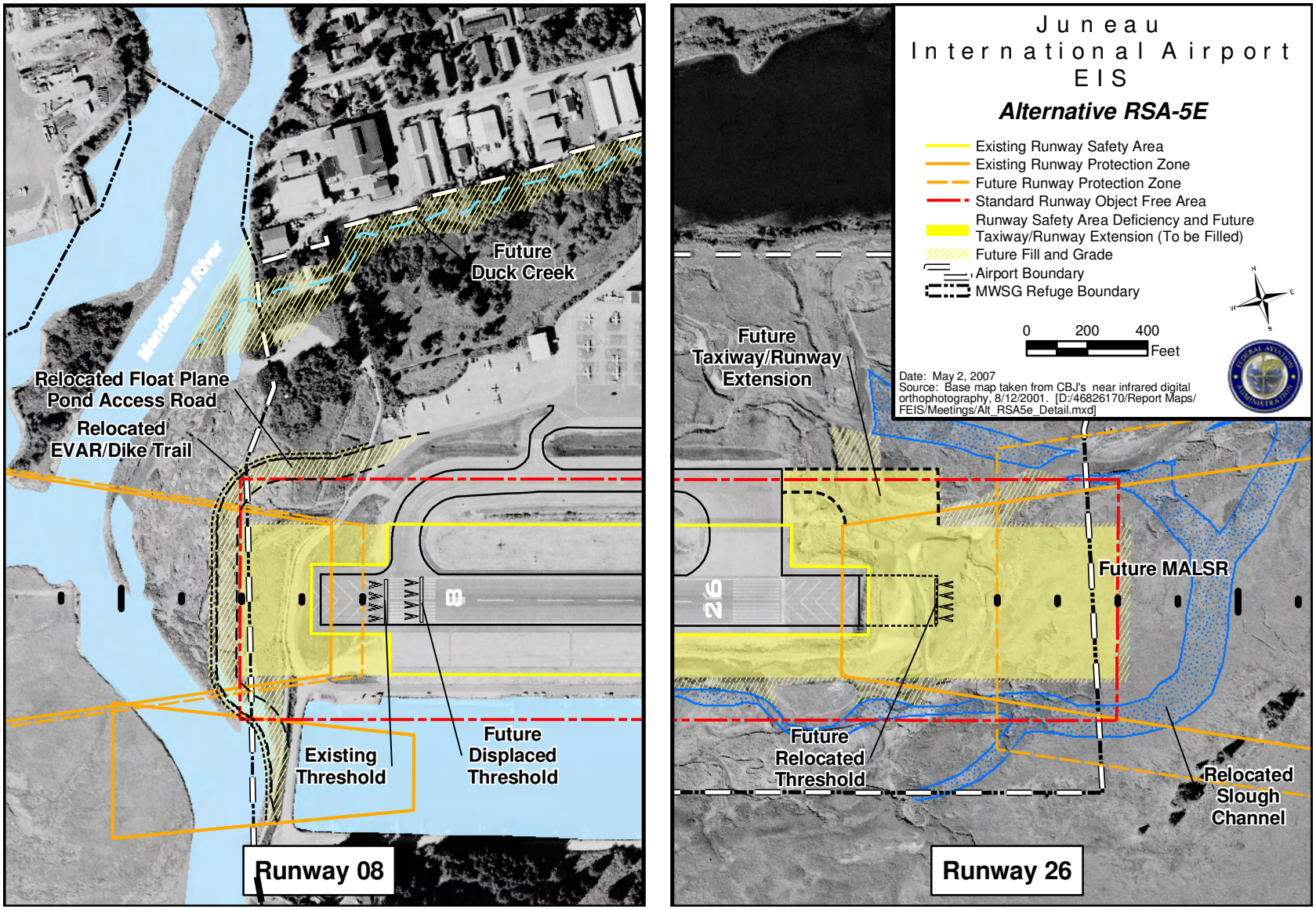

Figure 3. RSA-5E fill areas.

Sections 2.2, 2.6, and 2.11 of the FEIS provide more detail concerning the components of the FAA's Preferred Alternative RSA-5E. One difference from the FEIS description in Section 2.6.1.2 is in the Sponsor's plan for dredging fill from the Float Plane Pond. Since preparation of the FEIS the Sponsor has prepared a concept study for dredging (DOWL 2007). FAA's Preferred Alternative shall incorporate by reference all elements of this study that are included by state and federal agencies as permit conditions.

8.2 NAVIGATIONAL ALIGNMENT

Only one alternative was identified that would satisfy the need to improve pilot alignment with Runway 26 and the transition to visual references for landing at night and during poor weather conditions. FAA's Preferred Alternative and the Sponsor's Proposed Action to satisfy the need is NAV-2B, installation of the Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR). Although the MALSR would have a direct impact on the Refuge, a Department of Transportation (DOT) Section 4(f) land, there is no prudent and feasible alternative to the use of such land. To reduce environmental impacts on wetland habitat and the Refuge, the MALSR access road would extend east from the east Runway 26 RSA end, providing the shortest access to the approach and alignment indicator lights. For most of the route the access road would be constructed of a geotextile "honeycomb" placed on geotextile fabric, and recessed into the ground at least 1 foot with granular aggregate on top to approximately the existing ground surface. Natural vegetation should take hold through the road honeycomb and help restore the alignment to a more natural function and appearance. A series of large arch culverts or a span bridge would be used to cross the relocated East Runway Slough channel. Sections 2.3, 2.7.1, and 2.11.5 of the FEIS provide more detail concerning FAA's Preferred Alternative. Figure 4 illustrates the new Runway 26 MALSR aligned with the relocated threshold stemming from runway safety area improvements. The relocated slough channels are also highlighted in this figure.

8.3 SNOW REMOVAL EQUIPMENT AND MAINTENANCE FACILITY

Two alternatives were carried forward for detailed analysis in the EIS that would satisfy JNU's need for a new, improved SREF. Each of these alternatives was assumed to incorporate the same design, but in different locations. FAA's Preferred Alternative and the Sponsor's Proposed Action is SREF-3B1, to be located in the Northeast Development Area of the Airport just south of Yandukin Drive. While there are differences between the two action locations considered and their affect on the human environment, in general SREF-1B and SREF-3B1 would have similar levels of environmental consequences, with SREF-1B having slightly lesser impact on environmental resources such as vegetation, wetlands, EFH, and wildlife habitat. FAA agrees with JNU, however, that SREF-3B1 would provide an operationally superior location for the center of snow removal and maintenance facilities that would reduce potential conflicts with other airfield development and use. Sections 2.4.1 and 2.8.1 of the FEIS provide more detailed concerning Alternative SREF-3B1. Figure 5 shows a conceptual plan for a new snow removal equipment facility. Figure 6 includes the location of the new SREF within the northeast Airport development area.