CHAPTER THREE
ALTERNATIVES

3.1 INTRODUCTION AND BACKGROUND

The Council on Environmental Quality (CEQ) regulations (Title 40 Code of Federal Regulations [CFR] § 1502.14) for implementing the National Environmental Policy Act (NEPA) of 1969, require that Federal agencies perform the following tasks:

- Rigorously explore and objectively evaluate all reasonable alternatives and, for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated;
- Devote substantial treatment to each alternative considered in detail, including the Proposed Action, so that reviewers may evaluate their comparative merits;
- Include reasonable alternatives not within the jurisdiction of the lead agency; and
- Include the alternative of no action.

3.2 RANGE OF ALTERNATIVES

The analysis of the Supplement to the Final Environmental Impact Statement (SEIS) alternatives was an independent examination by the Federal Aviation Administration (FAA) using a two-step screening process:

1. The first step in the screening process was to identify if an alternative could meet the purpose for the Sponsor’s Proposed Project as described in detail in Chapter Two, Purpose and Need. Alternatives that did not meet the purpose for the project were excluded from further review.

2. The second step was to further evaluate the remaining alternatives for additional considerations, including environmental, operational, cost considerations, and reasonable, possible and prudent alternative considerations.

These considerations were associated with direct impacts on existing facilities that would result in substantial redevelopment, or inhibit development or maintenance of existing transportation infrastructure. The following summarizes the considerations used in the alternatives evaluation:

- **Environmental Considerations**: Alternatives with substantially higher adverse impacts beyond those of the Sponsor’s Proposed Project were not evaluated in detail. The Environmental Impact Statement (EIS) also recognized the Clean Water Act (CWA) Section 404(b)(1) guidelines, which provides that the U.S. Army Corps of Engineers (USACOE) would only permit the least environmentally damaging practicable alternative.
• **Operational Considerations:** Alternatives that clearly reduced the safe and efficient use of navigable airspace in the U.S. or would derogate the safety of aircraft and airport operations at Gnoss Field Airport (Airport or DVO) as compared to existing conditions were not retained for detailed consideration.

• **Cost Considerations:** Alternatives with costs substantially greater than the Sponsor’s Proposed Project were considered impracticable.

• **Reasonable, Possible and Prudent Alternative Considerations:** Reasonable alternatives are those that are feasible and prudent from a technical and economic standpoint and using common sense. 49 U.S. Code (USC) § 47106 (c)(1)(B) and FAA Order 5050.4B, paragraph 1007 (e)(4) state that the Secretary of Transportation may approve a project Grant-in-Aid application for a project involving a new airport, a new runway, or a major runway extension, having significant adverse effects. However, the Secretary may do so only after finding that no possible or prudent alternative that meets the Purpose and Need exists and making a finding that all possible planning to minimize harm has been taken. An alternative is considered “possible” (i.e. “feasible”) if, as a matter of sound engineering principles, it can be built. The term prudent refers to rational judgment. FAA Order 5050.4B, paragraph 1007 (e)(5) provides the following factors for the FAA to use to decide if an alternative is prudent:

1. Does it meet the project’s purpose and need?
2. Does it cause extraordinary safety or operational problems?
3. Are there unique problems or truly unusual factors present with the alternative?
4. Does it cause unacceptable and severe adverse social, economic, or other environmental impacts?
5. Does it cause extraordinary community disruption?
6. Does it cause added construction, maintenance, or operational costs of an extraordinary magnitude?
7. Does it result in an accumulation of factors that collectively, rather than individually, have adverse impacts that present unique problems or reach extraordinary magnitudes?

These seven factors were considered during the evaluation of the alternatives for this SEIS.

The alternatives that the FAA considered in this analysis are discussed below. As described in detail below, one additional alternative that was not evaluated in the June 2014 Final EIS is evaluated in this SEIS. This is Alternative E – Extend Runway to the Northwest by 300 feet.
**NO ACTION ALTERNATIVE**

In accordance with the CEQ regulations, a No Action Alternative must be carried forward in the assessment of environmental impacts. The No Action Alternative was included in the evaluation of potential environmental consequences in this SEIS, as required by 40 CFR § 1502.14(d). With a No Action Alternative, the airfield would remain as it is today, without an extension to the existing runway and no associated taxiway extension and levee relocations. Although, the No Action Alternative is not always reasonable, feasible, prudent, and does not always achieve a project’s purpose, the No Action Alternative is a potential alternative under CEQ regulations and provides a basis of comparison for the assessment of future conditions/impacts.

### 3.3 OFF-SITE ALTERNATIVES

Off-site alternatives were considered in the June 2014 Final EIS. No off-site alternatives were identified that met the purpose and need of this project and the alternatives screening criteria. Therefore, no off-site alternatives were evaluated in detail in the June 2014 Final EIS and none will be evaluated in this SEIS.

### 3.4 ON-SITE ALTERNATIVES

#### 3.4.1 RUNWAY DEVELOPMENT ALTERNATIVES AND SCREENING RESULTS

Four runway development alternatives were identified for evaluation (plus the No Action Alternative). These runway development alternatives include the alternatives previously identified in the June 2014 Final EIS. These alternatives also include an additional alternative identified subsequent to the determinations described in Chapter 2, *Purpose and Need*, that the current critical aircraft at DVO, and associated runway length necessary to meet the purpose and need for the project, were no longer the same as what was identified in the June 2014 Final EIS.

These alternatives were further screened to determine if they could substantially meet the purpose to allow existing aircraft, as represented by the family grouping of critical aircraft at DVO, to operate without operational weight restrictions under hot weather conditions, and the need to address insufficient runway length at DVO. The analysis of runway length identified that 3,600 feet was the minimum length to accommodate the critical aircraft (see Appendix D-1, *Runway Length Analysis*, for more information). Therefore, alternatives that included shorter runway lengths

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1 FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects*, April 28, 2006, Chapter 10, Section 1001. **EIS PURPOSE.** 40 CFR § 1502.1 states the primary purpose of an EIS is to be an “action-forcing tool” to ensure Federal government programs and actions meet NEPA’s goals and policies. The EIS allows the agency to take a “hard look” at the environmental impacts of the No Action, the proposed action, and its reasonable alternatives.
were considered but not retained for detailed review because they did not meet the purpose and need for the project. The purpose and need statements are discussed in detail in Chapter Two, *Purpose and Need*.

The runway development alternatives presented below all meet the purpose and need for the project. As such, the second screening for the additional considerations (significant operational and environmental drawbacks, and cost) was performed. DVO would remain open during construction under any development alternative and any operational modifications during construction would be addressed in a Construction Safety and Phasing Plan.

The runway development alternatives, along with the screening results of each are included in the following sections.

### 3.4.1.1 Alternative A: No Action

Alternative A (No Action), is identified as the No Action Alternative in this SEIS. This alternative assumes that Runway 13/31 would be maintained at its current length and no associated taxiway extension, Runway Safety Area (RSA) extension, realignment of drainage channels, extension of levees, or reprogramming of navigational aids would occur. **Exhibit 3-1, Alternative A: No Action**, presents a graphic depiction of Alternative A. Preliminary evaluation of Alternative A is as follows:

- **Environmental:** Would not result in physical environmental impacts (wetlands or cultural resources).
- **Operational:** Would continue the use of non-standard RSA and would not address the need for more runway length to accommodate current aircraft operators.
- **Cost:** No direct costs, but indirect costs would occur as a result of not meeting FAA standards and not providing the runway length to accommodate the current aircraft. Indirect costs include the loss of revenue to the Airport due to the fact that some pilots would choose not to use DVO, therefore depriving the County of revenues associated with the sale of fuel to these aircraft.
Alternative A: No Action

Legend
- Existing Runway Safety Area
- Existing Runway
- Existing Buildings
- Airport Property Boundary

Supplement to the Final Environmental Impact Statement
Gnoss Field Airport
Reasonable, Possible and Prudent Alternative Considerations:

1. Does it meet the project’s purpose and need? **No.**
2. Does it cause extraordinary safety or operational problems? **No.**
3. Are there unique problems or truly unusual factors present with the alternative? **No.**
4. Does it cause unacceptable and severe adverse social, economic, or other environmental impacts? **No.**
5. Does it cause extraordinary community disruption? **No.**
6. Does it cause added construction, maintenance, or operational costs of an extraordinary magnitude? **No.**
7. Does it result in an accumulation of factors that collectively, rather than individually, have adverse impacts that present unique problems or reach extraordinary magnitudes? **No.**

Determination: This alternative does not meet the purpose and need for the project. The No Action Alternative was included in the evaluation of potential environmental consequences in this SEIS, as required by 40 CFR § 1502.14(d).

3.4.1.2 Alternative B: Extend Runway to the Northwest by 1,100 Feet (Sponsor's Proposed Project)

Alternative B² (Sponsor’s Proposed Project), includes an extension of Runway 13/31 to the northwest by 1,100 feet for a total runway length of 4,400 feet at the existing runway width of 75 feet. In addition, this alternative would include extension of the parallel taxiway to match the length of the runway; extension of the existing FAA standard 120-foot wide RSA centered on the runway centerline to match the length of the runway; inclusion of FAA standard 240-foot RSA at each end of the runway in addition to the 1,100-foot runway extension; corresponding realignment of drainage channels to drain the extended runway, taxiway and RSA; corresponding levee extension to protect the extended runway, taxiway, and RSA from flooding; and relocation of the navigational aids that pilots use for approach to landing at the Airport to reflect the extended runway. **Exhibit 3-2, Alternative B: Sponsor’s Proposed Project - Extend Runway to the Northwest by 1,100 Feet**, presents a graphic depiction of Alternative B. Preliminary evaluation of Alternative B is as follows:

- Environmental:
  - Would require the relocation of the levee and drainage ditch around the runway.

² Appendix Q-1, FAA Response to Comments Received on the Draft Supplement to the Final Environmental Impact Statement, discloses the environmental impacts of implementing Alternative B or Alternative D including larger runway safety areas to accommodate FAA Airport Reference Code B-II aircraft.
The area where the runway extension and northern RSA would be located is almost entirely wetlands that would require filling.

There are potential cultural resources and habitat impacts due to the alternative.

Would result in aircraft shifting where the climb to altitude would occur when departing to the south. Aircraft would be at a higher altitude than is currently experienced with the existing runway before passing near the residential areas to the south of the Airport, which would potentially decrease aircraft departure noise levels in those communities.

- **Operational:**
  - The runway would be extended closer to the landfill northeast of the Airport, which is a potential bird-attractant. This alternative could be inconsistent with FAA bird-aircraft strike hazard minimization guidance.
  - Would require relocation of the Precision Approach Path Indicator (PAPI) and Visual Approach Slope Indicator (VASI) navigational aids that pilots use for approach to landing at the Airport to reflect the extended runway.
  - Would address the need for additional runway length.

- **Cost:**
  - Acquisition costs for the County to gain exclusive use of 0.1 acres of land to the south of the Airport that would be required for the associated RSA extension.

- **Reasonable, Possible and Prudent Alternative Considerations:**
  1. Does it meet the project’s purpose and need? **Yes.**
  2. Does it cause extraordinary safety or operational problems? **No.**
  3. Are there unique problems or truly unusual factors present with the alternative? **No.**
  4. Does it cause unacceptable and severe adverse social, economic, or other environmental impacts? **No.**
  5. Does it cause extraordinary community disruption? **No.**
  6. Does it cause added construction, maintenance, or operational costs of an extraordinary magnitude? **No.**
  7. Does it result in an accumulation of factors that collectively, rather than individually, have adverse impacts that present unique problems or reach extraordinary magnitudes? **No.**

- **Determination:** This alternative meets the need for the project and is the Sponsor’s Proposed Project. Therefore, this alternative will be carried forward for detailed analysis.
Alternative B: Sponsor's Proposed Project - Extend Runway to the Northwest by 1,100 feet
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3.4.1.3 Alternative C: Extend Runway to the Southeast by 1,100 Feet

Alternative C includes an extension of Runway 13/31 to the southeast by 1,100 feet for a total runway length of 4,400 feet at the existing runway width of 75 feet. In addition, this alternative would include extension of the parallel taxiway to match the length of the runway; extension of the existing FAA standard 120-foot wide RSA centered on the runway centerline to match the length of the runway; inclusion of FAA standard 240-foot RSA at each end of the runway in addition to the 1,100-foot runway extension; corresponding realignment of drainage channels to drain the extended runway and taxiway; corresponding levee extension to protect the extended runway and taxiway from flooding; corresponding relocation of the access road south of the runway, which extends from the west side to the east side of the Airport, to keep the access road outside of the RSA; and relocation of the navigational aids that pilots use to land at the Airport to reflect the extended runway. Exhibit 3-3, Alternative C: Extend Runway to the Southeast by 1,100 Feet, presents a graphic depiction of Alternative C. Preliminary evaluation of Alternative C is as follows:

- Environmental:
  - Would result in extensive impacts to the water resources to the south of the Airport (Black John Slough) and wetlands. Also to consider is the fact that, relative to the CWA Section 404 (b)(1) guidelines, the USACOE would only permit the least damaging practicable alternative.
  - There are potential cultural resources and habitat impacts due to the alternative.
  - Would move the runway closer to protected wildlife areas to the southeast of the Airport.
  - Because the landing threshold for Runway 13 would be closer to the residential areas to the south of the Airport, aircraft approaching to land at DVO from the south would be at a lower altitude on approach than is experienced with the existing runway when passing near the residential areas to the south of the Airport; this could potentially increase aircraft approach noise levels in those communities.

- Operational:
  - Would result in the runway being located more centrally to the aircraft hangars.
  - Would address both the non-standard RSA and the need for additional runway length.
  - The PAPI and VASI navigational aids, which provide visual approach guidance for aircraft landing at the Airport, would be relocated with the extended runway closer to the residential areas to the south of the Airport. This would require a steeper angle of approach than is experienced with the existing runway threshold, which is already set at 4.0 degrees (3.0 degrees is the standard). If the approach angle is steepened, aircraft could potentially approach at faster speeds,
particularly when crosswinds are present. This condition exacerbates the need for additional runway length by potentially needing more than 4,400 feet.

- **Cost:**
  - Would be the most expensive alternative due to the need to acquire approximately 13 acres of land (currently privately owned) and additional environmental mitigation costs.

- **Reasonable, Possible and Prudent Alternative Considerations:**
  1. Does it meet the project’s purpose and need? **Yes.**
  2. Does it cause extraordinary safety or operational problems? **No.**
  3. Are there unique problems or truly unusual factors present with the alternative? **No.**
  4. Does it cause unacceptable and severe adverse social, economic, or other environmental impacts? **Yes.** Wetland impacts are more severe than under other alternatives, and therefore unlikely to receive a CWA Section 404 permit as other, less environmentally damaging, practicable alternatives, are available.
  5. Does it cause extraordinary community disruption? **No.**
  6. Does it cause added construction, maintenance, or operational costs of an extraordinary magnitude? **No.**
  7. Does it result in an accumulation of factors that collectively, rather than individually, have adverse impacts that present unique problems or reach extraordinary magnitudes? **Yes.** This alternative is not prudent given that other alternatives are less costly and more protective of the environment.

- **Determination:** This alternative meets the need of the project. This alternative requires greater amounts of fill of waters and wetlands when compared to Alternative B, or Alternatives D or E (described below), including the necessity to fill portions of the waters of Black John Slough. This alternative also requires land acquisition for construction and would require more aquatic mitigation than Alternatives B, D or E. The CWA Section 404, (b)(1) guidelines only allow the USACOE to permit the least environmentally damaging practicable alternative. As the same project purpose can be accomplished by implementation of Alternatives B, D, or E it is unlikely that the USACOE would issue Marin County a CWA Section 404 permit to construct Alternative C, when Alternatives B, D, and E have been identified as practicable. Therefore, this alternative will not be carried forward for detailed analysis.
Alternative C:
Extend Runway to the Southeast by 1,100 Feet

- Extend Taxiway
- Construct 240-Foot x 120-Foot Safety Area
- Acquire 13.4 Acres of Land
- Relocate Runway End and Taxiway Connector 140 Feet South
- 1,100-Foot Runway Extension
- Relocated Access Road
3.4.1.4 Alternative D: Extend Runway to the Southeast by 240 Feet and To the Northwest by 860 Feet

Alternative D\(^3\) includes an extension of Runway 13/31 to the southeast by 240 feet and to the northwest by 860 feet for a total runway length of 4,400 feet at the existing runway width of 75 feet. In addition, this alternative would include extension of the parallel taxiway to match the length of the runway; extension of the existing FAA standard 120-foot wide RSA centered on the runway centerline to match the length of the runway; inclusion of FAA standard 240-foot RSA at each end of the runway in addition to the 1,100-foot runway extension; corresponding relocation of the south access road from the west to the east of the Airport to maintain separation of ground vehicle traffic from aircraft traffic; corresponding realignment of drainage channels to drain the extended runway and taxiway; corresponding levee extension to protect the extended runway and taxiway from flooding; and relocation of the navigational aids that pilots use to land at the Airport to reflect the extended runway.

Exhibit 3-4, Alternative D: Extend Runway to the Southeast by 240 Feet and to the Northwest by 860 Feet, presents a graphic depiction of Alternative D. Several variations of Alternative D were considered that relocated the access road for Alternative D farther south than shown on Exhibit 3-4. These variations were not evaluated in detail because compared to Alternative D, they increased the amount of time required for ground vehicles to traverse the runway protection zone; increased wetland fill and mitigation requirements over Alternative D; and increased costs. Preliminary evaluation of Alternative D is as follows:

- **Environmental:**
  - Would require the relocation of the levee and drainage ditch around the runway.
  - The area where the runway extension would be located is almost entirely wetlands that would require filling.
  - Would require relocation of a portion of the access road between west and east areas of the Airport at the south end of Runway 31.
  - There are potential cultural resources and habitat impacts due to the alternative.
  - Would move the runway closer to protected wildlife areas to the southeast of the Airport.
  - Because the landing threshold for Runway 13 would be closer to the residential areas to the south of the Airport, aircraft approaching to land at DVO from the south, would be at a lower altitude on approach than is

\(^3\) Appendix Q-1, FAA Response to Comments Received on the Draft Supplement to the Final Environmental Impact Statement, discloses the environmental impacts of implementing Alternative B or Alternative D including larger runway safety areas to accommodate FAA Airport Reference Code B-II aircraft.
experienced with the existing runway when passing near the residential areas to the south of the Airport; this could potentially increase aircraft approach noise levels in those communities.

- **Operational:**
  - Would move the runway closer to the landfill northeast of the Airport, but not as much as Alternative B.
  - Would address the need for additional runway length.
  - The PAPI and VASI navigational aids, which provide visual approach guidance for aircraft landing at the Airport, would be relocated with the extended runway closer to the residential areas to the south of the Airport. This would require a steeper angle of approach than is experienced with the existing runway threshold, which is already set at 4.0 degrees (3.0 degrees is the standard). If the approach angle is steepened, aircraft could potentially approach at faster speeds, particularly when crosswinds are present. This condition exacerbates the need for additional runway length by potentially needing more than 4,400 feet.

- **Cost:**
  - Would require additional costs for acquisition of 3.72 acres of land (currently privately owned).

- **Reasonable, Possible and Prudent Alternative Considerations:**
  1. Does it meet the project’s purpose and need? **Yes.**
  2. Does it cause extraordinary safety or operational problems? **No.**
  3. Are there unique problems or truly unusual factors present with the alternative? **No.**
  4. Does it cause unacceptable and severe adverse social, economic, or other environmental impacts? **No.**
  5. Does it cause extraordinary community disruption? **No.**
  6. Does it cause added construction, maintenance, or operational costs of an extraordinary magnitude? **No.**
  7. Does it result in an accumulation of factors that collectively, rather than individually, have adverse impacts that present unique problems or reach extraordinary magnitudes? **No.**

- **Determination:** This alternative meets the need of the project and includes similar environmental impacts as the Sponsor’s Proposed Project. Therefore, this alternative will be carried forward for detailed analysis.
Alternative D: Extend Runway to the Southeast by 240 Feet and to the Northwest by 860 Feet
3.4.1.5 Alternative E: Extend Runway to the Northwest by 300 Feet

(FAA’s Preferred Alternative)

Alternative E includes a shift of Runway 13/31 106 feet to the northwest and extension of Runway 13/31 300 feet to the northwest from 3,300 feet to a total length of 3,600 feet while maintaining the 75-foot width of the runway. In addition, this alternative would include the relocation of existing taxiways accessing south end of Runway 13/31 to new runway end; extension of the parallel taxiway to match the full length of the runway; widening of the existing FAA standard 120-foot wide RSA centered on the runway centerline to match the width of 150 feet centered on the runway centerline; inclusion of FAA standard 300-foot RSA at each end of the runway in addition to the 300-foot runway extension; corresponding realignment of drainage channels to drain the extended runway, taxiway and RSA; corresponding levee extension to protect the extended runway, taxiway, and RSA from flooding; and relocation of the navigational aids that pilots use for approach to landing at the Airport to reflect the extended runway. Exhibit 3-5, Alternative E: Extend Runway to the Northwest by 300 Feet, presents a graphic depiction of Alternative E. Preliminary evaluation of Alternative E is as follows:

- Environmental:
  - Would require the relocation of the levee and drainage ditch around the runway.
  - The area where the runway extension and northern RSA would be located is almost entirely wetlands that would require filling.
  - There are potential cultural resources and habitat impacts due to the alternative.
  - Would result in aircraft shifting where the climb to altitude would occur when departing to the south. Aircraft would be at a higher altitude than is currently experienced with the existing runway before passing near the residential areas to the south of the Airport, which would potentially decrease aircraft departure noise levels in those communities.

- Operational:
  - The runway would be extended closer to the landfill northeast of the Airport, which is a potential bird-attractant. This alternative could be inconsistent with FAA bird-aircraft strike hazard minimization guidance.
  - Would require relocation of the PAPI and VASI navigational aids that pilots use for approach to landing at the Airport to reflect the extended runway.
  - Would address the need for additional runway length.

- Cost:
  - No land acquisition costs. As Alternative E is a much smaller construction project than Alternatives B, C, or D, its construction costs and environmental mitigation costs would be much less than those for Alternatives B, C, or D.
Reasonable, Possible and Prudent Alternative Considerations:

1. Does it meet the project’s purpose and need? **Yes**.
2. Does it cause extraordinary safety or operational problems? **No**.
3. Are there unique problems or truly unusual factors present with the alternative? **No**.
4. Does it cause unacceptable and severe adverse social, economic, or other environmental impacts? **No**.
5. Does it cause extraordinary community disruption? **No**.
6. Does it cause added construction, maintenance, or operational costs of an extraordinary magnitude? **No**.
7. Does it result in an accumulation of factors that collectively, rather than individually, have adverse impacts that present unique problems or reach extraordinary magnitudes? **No**.

Determination: This alternative meets the need for the project and is consistent with the minimum runway length requirement for the current family grouping of critical aircraft at DVO. Therefore, this alternative will be carried forward for detailed analysis.
406-Foot Runway Construction (300-Foot Runway Extension Plus 106-Foot Runway Shift)  
Taxiway Extension  
Construct 300-Foot x 150-Foot Safety Area  
Extend Levee and Drainage Ditch  
Proposed Taxiway and Safety Areas  
Proposed Drainage Ditch  
Proposed Levee  
Existing Runway  
Existing Buildings  
Airport Property Boundary  

Alternative E:  
Extend Runway to the Northwest by 300 Feet
3.4.2 RUNWAY ALTERNATIVE SCREENING SUMMARY

Based on the analysis presented above and summarized in Table 3-1, the following alternatives are carried forward for further evaluation:

1. Alternative A: No Action;
2. Alternative B: Extend Runway to the Northwest by 1,100 Feet (Sponsor's Proposed Project);
3. Alternative D: Extend Runway to the Southeast by 240 Feet and to the Northwest by 860 Feet; and
4. Alternative E: Extend Runway to the Northwest by 300 Feet.

3.4.3 FAA PREFERRED ALTERNATIVE

Alternative E, extend Runway 13/31 to the northwest by 300 feet, is the FAA’s Preferred Alternative. Extending Runway 13/31 to the northwest by 300 feet would meet the Sponsor’s purpose and need for the proposed project to allow existing aircraft, as represented by the family grouping of critical aircraft at DVO, to operate without operational weight restrictions under hot weather conditions, without derogating the safety of aircraft and airport operations, and with fewer adverse environmental impacts than Alternatives B and D. As a smaller project, Alternative E would have lower construction and environmental mitigation costs than Alternative B or Alternative D.

3.4.4 ENVIRONMENTALLY PREFERRED ALTERNATIVE

Of all alternatives considered, the No Action Alternative has the fewest environmental impacts and is considered the Environmentally Preferred Alternative. However, the No Action Alternative does not meet the project purpose and need. Of the project alternatives that do meet the project purpose and need, Alternative E, extend Runway 13/31 to the northwest by 300 feet, would be the Environmentally Preferred Alternative because it has fewer environmental impacts than Alternative B, extend Runway 13/31 to the northwest by 1,100 feet, or Alternative D, extend Runway 13/31 southeast by 240 feet and northwest by 860 feet. Alternative E is the least environmentally damaging practicable alternative that meets the purpose and need of the proposed project.
### Table 3-1
**RUNWAY DEVELOPMENT ALTERNATIVES EVALUATION MATRIX**

**Gnoss Field Airport**

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
<th>Step 1: Does it Meet the Airport’s Need to provide sufficient runway length?</th>
<th>Step 2: Additional Considerations</th>
<th>Preliminary Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>No Action</td>
<td>no</td>
<td>Would continue the use of non-standard Runway Safety Areas and would not address the need for more runway length to accommodate current aircraft operators.</td>
<td>Alternative does not meet the Purpose and Need for the project. 40 CFR § 1502.14(d) guidelines require a No Action Alternative be included in the evaluation of environmental consequences, therefore this alternative will be carried forward for detailed analysis.</td>
</tr>
<tr>
<td>B*</td>
<td>Extend Runway to the Northwest by 1,100 Feet (Sponsor’s Proposed Project)</td>
<td>yes</td>
<td>Would require the relocation of the levee and drainage ditch around the northern portion of the runway resulting in the permanent removal of wetland habitat. Would require the temporary and permanent removal of endangered species habitat. Although there is no known cultural resources impact from this Alternative, there are potential cultural resource impacts and monitoring would be required. Would result in aircraft shifting where the climb to altitude would occur when departing to the south. Aircraft would be at a higher altitude than is currently experienced with the existing runway before passing near the residential areas to the south of the Airport, which would potentially increase aircraft departure noise levels in those communities. Would require construction in the 100-year floodplain.</td>
<td>Alternative meets the need of the project and is the Sponsor's Proposed Project. Therefore, this alternative will be carried forward for detailed analysis.</td>
</tr>
<tr>
<td>C</td>
<td>Extend Runway to the Southeast by 1,100 Feet</td>
<td>yes</td>
<td>Would require the extension of the levee and drainage ditch to the south of the existing runway resulting in more extensive permanent removal of wetland habitat than Alternative B, Alternative D, or Alternative E, including a portion of Black John Slough. Would require more extensive temporary and permanent removal of endangered species habitat than Alternative B, Alternative D, or Alternative E. Although there is no known cultural resources impact from this Alternative, there are potential cultural resource impacts and monitoring would be required. Because the landing threshold for Runway 13 would be closer to the residential areas to the south of the Airport, aircraft approaching to land at DVO from the south, would be at a lower altitude on approach than is experienced with the existing runway when passing near the residential areas to the south of the Airport; this could potentially increase aircraft noise levels in those communities. Would require construction in the 100-year floodplain.</td>
<td>Alternative meets the need of the project. However, the additional environmental impacts, associated costs, and the need to purchase large amounts of land are considered impractical. Therefore, this alternative will not be carried forward for detailed analysis.</td>
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Table 3-1, Continued
RUNWAY DEVELOPMENT ALTERNATIVES EVALUATION MATRIX
Gnoss Field Airport

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Description</th>
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<th>Step 2: Additional Considerations</th>
<th>Preliminary Determination</th>
</tr>
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<tbody>
<tr>
<td>D*</td>
<td>Extend Runway to the Southeast by 240 Feet and to the Northwest by 860 Feet</td>
<td>yes</td>
<td>• Would require the relocation of the levee and drainage ditch around north and south portions of the runway resulting in permanent removal of wetland habitat similar, but slightly larger, than Alternative B and substantially larger than Alternative E. • Would require the temporary and permanent removal of endangered species habitat similar to, but slightly higher than, Alternative B, and substantially larger than Alternative E. • Although there is no known cultural resources impact from this Alternative, there are potential cultural resource impacts and monitoring would be required. • Would result in aircraft shifting where the climb to altitude would occur when departing to the south. Aircraft would be at a higher altitude than is currently experienced with the existing runway before passing near the residential areas to the south of the Airport, but not as high as Alternative B, which would potentially decrease aircraft departure noise levels in those communities. • Would require construction in the 100-year floodplain.</td>
<td>• Addresses both the non-standard Runway Safety Area and the need for additional runway length. • The runway would be extended closer to the landfill northeast of the Airport, which is a potential bird-attractant. This alternative could be inconsistent with FAA bird-aircraft strike hazard guidance. • The PAPI and VASI navigational aids, which provide visual approach guidance for aircraft landing at the Airport, would be relocated with the extended runway closer to the residential areas to the south of the Airport. This would require a steeper angle of approach than is experienced with the existing runway threshold, which is already set at 4.0 degrees (3.0 degrees is the standard). If the approach angle is steepened, aircraft could potentially approach at faster speeds, particularly when crosswinds are present. This condition exacerbates the need for additional runway length by potentially needing more than 4,400 feet.</td>
</tr>
<tr>
<td>E</td>
<td>Extend Runway to the Northeast by 300 Feet</td>
<td>yes</td>
<td>• Would require the relocation of the levee and drainage ditch around the northern portion of the runway, resulting in the permanent removal of wetland habitat. However, the amount of wetland habitat removed is substantially less than that for other alternatives. • Although there is no known cultural resources impact from this Alternative, there are potential cultural resource impacts and monitoring would be required. • Would result in aircraft shifting where the climb to altitude would occur when departing to the south. Aircraft would be at a higher altitude than is currently experienced with the existing runway before passing near the residential areas to the south of the Airport, which would potentially decrease aircraft departure noise levels in those communities. • Would require construction in the 100-year floodplain.</td>
<td>• Addresses both the non-standard Runway Safety Area and the need for additional runway length. • The runway would be extended closer to the landfill northeast of the Airport, which is a potential bird-attractant. This alternative could be inconsistent with FAA bird-aircraft strike hazard guidance. • Would require relocation of the PAPI/VASI navigational aids that pilots use for approach to landing at the Airport to reflect the extended runway.</td>
</tr>
</tbody>
</table>

Appendix Q-1, FAA Response to Comments Received on the Draft Supplement to the Final Environmental Impact Statement, discloses the environmental impacts of implementing Alternative B or Alternative D including larger runway safety areas to accommodate FAA Airport Reference Code B-II aircraft.