Appendix P: Summary of Resource Category Reduction, Avoidance, and Minimization Measures

Summary of Impacts, Permits and Minimization Measures for Alternative #1 and #2

Resource Topic	Summary of Impacts, Permits and Minimization Measures
Air Quality and Transportation	Air Quality **Conclusions:** Alternative #1 would generate construction-related emissions in 2027, 2028, and 2032–2034. Because this alternative does not change operational activities, no operational emissions would occur. Emissions associated with Alternative #1 are presented in **Table 5-1**. Under Alternative #2, construction-related emissions are expected from 2026 through 2036. Operational emissions would also occur during these same years and were evaluated for each construction year as well as for a future build-out year, 2041. Emissions associated with Alternative #2 are presented in **Table 5-2**. For both Alternative #1 and #2, General Conformity was demonstrated by comparing projected emissions against the applicable Clean Air Act *de minimis* thresholds. The analyses show that neither alternative would generate emissions exceeding those thresholds. As a result, both Alternative #1 and #2 conform to the approved State Implementation Plan and are not expected to cause any significant adverse air quality impacts. Therefore, no further action is required under the General Conformity Rule. **Permits Prior to Construction:** None **Minimization Measures:** None Surface Traffic and Transportation **Conclusions:** Alternative #1 and #2 are not anticipated to result in significant traffic impacts along off-airport roadways. During construction, there would be some potential temporary increases in delay, particularly at the intersection of Prince William Parkway and Clover Hill Rd due to the additional traffic generated by construction worker trips and trucks. It should be noted that the duration of the potential temporary traffic impacts would likely be short, about one hour in the morning and one hour during the afternoon since construction worker trips are highly peaked. Upon implementation of temporary minor changes in traffic operations (i.e., signal timing and phasing modifications), as needed, all 95 percentile vehicle queues would be accommodated within existing available lane storage. **Permits Prior to Construction:** None **Minimization Measures:** Maintenance and Protection of Traffic Plans would be developed during the Design phase to help control, minimize or mitigate any potential disruptions to the traveling public during construction. Traffic operations would be monitored and any signal timing modifications implemented would be coordinated with the construction schedule to minimize temporary impacts to the traveling public.

Summary of Impacts, Permits and Minimization Measures for Alternative #1 and #2

Resource Topic	Summary of Impacts, Permits and Minimization Measures
Biological Resources	Alternative #1 projects require earth disturbance and new structures and would be built within areas already heavily mowed and managed for existing Airport operations. As minimal habitat for biological resources occurs in these areas, no significant impacts to biological resources are anticipated due to construction. No change in operations would occur due to Alternative #1; thus, no significant impacts to biological resources are anticipated. Construction of PEA Projects in Alternative #2 could affect bats, grassland and migratory birds. Disturbance to habitat for the bat species noted in **Table 5-3** would result from the removal of trees in Project #5, the disturbance to the Taxiway Bravo and Runway 16L/34R Bridges in Project #6, or from structure removal (Building 13) supporting Project #7. Migratory bird nesting habitats could be affected by the removal of trees in Project #5 and grassland habitat may be impacted by the re-use of the bypass channel in Project #6. Most other grassy portions of the Airport are maintained too short to provide significant habitat. No impacts to mussel species are anticipated as low-flow conditions would be maintained in Broad Run and construction work would be separated from the water by double-tee structures. To avoid harm to the State listed roosting bat species, the proponent would uphold the timing restriction recommended by the USFWS and would thus avoid disturbance to these features (clearing trees and shrubs, removal or replacement of structures and bridges) from April 1 to November 15. Adherence to this restriction would result in minimal direct impacts to listed bat species. In the event the seasonal timing restriction cannot be upheld, bat surveys would be conducted in accordance with USFWS Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines. Results of this survey would be shared with USFWS, and construction would not proceed until effective strategies to avoid harm to listed bat species are formally established. Impacts to migratory birds would be avoided by further limiting the removal of trees and shrubs between March 15 to August 15 and avoiding mowing of areas with taller vegetation (bypass channel associated with Project #6) between April 1 and August 31, unless continuous mowing has occurred prior to April 1 and would continue through August 31. In the event the seasonal timing restriction cannot be upheld, field inspections for nesting migratory and grassland birds would be performed before construction to document evidence of active nesting sites or breeding behavior, in which disturbance to those areas would be avoided. Before tree clearing for Project #5, an evaluation for bald eagle and/or peregrine falcon nests would be performed. In the event a peregrine falcon nest is observed, a timing restriction would be implemented between February 15 through July 15 for any activities within 600 ft of a nest or nestbox. In the event a bald eagle nest is observed, further consultation with the VADWR would take place to evaluate potential impacts. By redesigning Project #6 to utilize construction methods that would allow the seasonal low flow of Broad Run to continue (7-8 cubic feet per second), and ensuring proper erosion and sediment controls are utilized, impacts to freshwater mussels would be minimized to the greatest extent practicable. BMPs would be utilized to prevent the introduction and spread of noxious weeds and pests during project implementation (**Appendix J**).

Summary of Impacts, Permits and Minimization Measures for Alternative #1 and #2

Resource Topic	Summary of Impacts, Permits and Minimization Measures
	Permits Prior to Construction: None **Measures Before Construction:** None
Coastal Resources	**Conclusions:** Alternative #1 and #2 would not result in direct impacts to coastal resources, including Resource Protection Areas (RPAs). The Prince William County Department of Environmental Management Division accepted the conclusion that the RPA near Project #5 would be avoided. No significant adverse impacts to coastal resources would occur, and no mitigation is required. Flow in Broad Run will continue during construction of Project #6 so that no impacts to downstream portions within Prince William County are impacted. Stringent erosion and sediment controls and BMPs will be utilized during construction in proximity to Cannon Branch's RPA and in and around Broad Run. **Permits Prior to Construction:** Permitting for temporary and permanent wetland and stream impacts would be required through VADEQ and USACE. Commonwealth concurrence for Coastal Zone Consistency will be included in this PEA when received. **Minimization Measures:** Alternative #1 and #2 would not result in significant adverse impacts on coastal resources; therefore, no mitigation is required. However, elements have been incorporated into Project #5 and Project #6, including the use of BMPs during construction, erosion and sediment controls, and maintenance of flow, to minimize and/or avoid potential adverse impacts to the RPA in proximity to Project #5's eastern boundary and to the waters of Broad Run.
Department of Transportation Act Section 4(f) Resources	**Conclusions:** There are no direct impacts from Alternative #1 and #2 to publicly owned parks, recreation areas, wildlife and/or waterfowl, and historic sites listed on or determine eligible to the NRHP. The direct APE, however, is overlain by eligible Civil War battlefields which are larger in extent than any of the battlefields. It has been previously determined during the assessment of effects on projects at the Airport that there would be no impacts to significant elements of the battlefields from Alternative #1 and #2 within the Airport boundary. Indirect effects on Section 4(f) resources were assessed for effects from Air Quality, Noise, and Visual Effects. None of the Section 4(f) resources are managed for air quality or noise. Changes in viewshed are ameliorated by terrain, elevation, line-of-sight building blocks, and distance. The only tree cover being removed is in Project #5. Analysis found that the viewshed from historic properties remains effectively unchanged because of terrain, distance, and line-of-sight interruption from intervening buildings. **Permits Prior to Construction:** None **Minimization Measures:** None

Summary of Impacts, Permits and Minimization Measures for Alternative #1 and #2

Resource Topic	Summary of Impacts, Permits and Minimization Measures
Hazardous Materials, Solid Waste and Pollution Prevention	**Conclusions:** Implementation of Alternative #1 and #2 would temporarily increase hazardous materials including diesel and maintenance products including hydraulic and motor oils. Contaminants in soil and groundwater that may be present from historic operations, including emerging contaminants (PFAS) have the potential to be encountered during construction. Installation of permanent petroleum and/or chemical tanks maybe required for facility operations. Hazardous building materials including lead, asbestos, mercury and polychlorinated biphenyls (PCBs) may also be encountered via demolition and/or renovation of existing structures. Further, an overall increase in the storage of hazardous materials due to new building operations would also result from Alternative #1 and #2. Alternative #1 and #2 would result in a short-term increase in construction and demolition (C&D) along with an increase in operational solid waste. Alternative #1 and #2 would also result in disturbance of areas greater than one acre, which requires project-specific Stormwater Pollution Prevention Plans (SWPPPs) prior to the start of ground-disturbing activities. **Permits Prior to Construction:** Virginia Department of Labor and Industry notification of asbestos abatement under Alternative #2; and VADEQ Approval of SWPPPs. **Minimization Measures:** Pre-demolition hazardous building material surveys would be conducted under Alternative #2 to identify potential asbestos, lead, mercury and/or PCBs that require abatement or disposal prior to renovation or demolition. As design advances, a subsurface investigation would be performed to confirm if potential vapor conditions exist and if found, would be addressed through placement of vapor barriers as needed. Under Alternative #1 and #2, project-specific SWPPPs would be prepared and approved in accordance with VADEQ requirements. Further, project-specific Soil and Materials Management Plans (SMMPs) and Construction Health and Safety Plans (CHASPs) would be prepared prior to construction and implemented by the contractor(s) to address the handling and disposal of potential contaminants of concern that may be encountered during construction.
Historical, Architectural, Archaeological and Cultural Resources	**Conclusions:** The Alternative #1 and #2 project areas have been irrevocably disturbed by prior construction area, and no significant cultural resources are present within the projects or their 100-ft construction buffers. The indirect effects on cultural resources were assessed, and no effects were identified. **Permits Prior to Construction:** None **Minimization Measures:** None
Land Use	**Conclusions:** The Alternative #1 and #2 projects would occur on Airport property, and no land acquisition would be needed. Therefore, both Alternative #1 and #2 would be compatible with the surrounding area and no impacts to land use would occur.

Summary of Impacts, Permits and Minimization Measures for Alternative #1 and #2

Resource Topic	Summary of Impacts, Permits and Minimization Measures
	Permits Prior to Construction: None **Minimization Measures:** None
Natural Resources and Energy Supply	**Conclusions:** Construction would increase the energy demand at the Airport; however, this increase would be accommodated with the existing utility system for both Alternative #1 and #2. Coordination with local energy suppliers has been initiated and there are no supply issues noted. As previously described, Alternative #1 and #2 would be designed to meet current energy efficient code requirements and could also include sustainable design elements to reduce energy consumption. These elements may include energy efficient lighting and equipment. DOAV's Virginia Airports Sustainability Management Plan provides a wide range of sustainable elements that the selected design contractor could implement. **Permits Prior to Construction:** Assumptions have been made based on preliminary design. These include stated consideration of the following building codes: • 2021 Virginia Construction Code (VCC)/Virginia Uniform Statewide Building Code (VUSBC), which adopts and amends the 2021 International Building Code (IBC) • 2021 Virginia Statewide Fire Prevention Code (VSFPC), which adopts and amends the 2021 International Fire Code (IFC) National Fire Protection Association (NFPA) Standards • NFPA 13, Standard for The Installation Of Sprinkler Systems, 2019 • NFPA 70, National Electric Code, 2020 • NFPA 72, National Fire Alarm and Signaling Code, 2019 • NFPA 415, Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways, 2022 (Note That NFPA 415 is not adopted by VUSBC or VSFPC, however it may be used as a reference/best practice for requirements specific to airport terminal buildings) • 2010 ADA Standards • 2018 International Energy Conservation Code (IECC) Virginia Energy Code **Minimization Measures:** None
Noise and Noise-Compatible Land Use	**Conclusions:** Only Alternative #2 would result in a change in aircraft operations and fleet mix. The Alternative #2 (2036) DNL 65 dBA Noise Exposure Contour would encompass 87 acres of non-airport property within the DNL 65 dBA contour, including one residential property. The Alternative #2 (2041) DNL 65 dBA Noise Exposure Contour would encompass 101 acres of non-airport property, including two residential properties. The residential properties would experience an overall increase in DNL of 4.8 dBA compared to the No Action Alternative in 2036 and would be newly exposed to DNL 65 dBA. DNL of 5.0 dBA and 5.1 dBA compared to the No Action

Summary of Impacts, Permits and Minimization Measures for Alternative #1 and #2

Resource Topic	Summary of Impacts, Permits and Minimization Measures
	Alternative in 2041 and would be newly exposed to DNL 65 dBA. However, with mitigation measures, such as land acquisition or sound insulation, the effects of the aviation noise can be minimized. According to Section 58 of the City of Manassas Code of Ordinances, public construction projects are exempt from the maximum permissible sound-level exceedances that normally apply to construction activities. **Permits Prior to Construction:** None **Minimization Measures:** The Airport is committed to reaching out to the two property owners in the future to conduct indoor noise measurements, if commercial service comes to HEF, and operational levels reach the predicted point of potentially causing adverse effects.
Socioeconomics and Children's Health and Safety Risks	Socioeconomics **Conclusions:** Alternative #1 and #2 would not result in induced growth and would have no adverse impacts to economic growth, no disruption to an established community, no relocation of residences, no adverse impacts to the community tax base, and no adverse impacts to businesses. The outdoor areas of two residential properties, but not the home itself, are within the 2036 and 2041 DNL 65 dBA noise contours. **Permits Prior to Construction:** None **Minimization Measures:** None Children's Health and Safety **Conclusions:** Alternative #1 and #2 would not result in exposure to significant levels of noise (see noise section above for discussion of two residential properties), nor release of harmful agents in the water, air, or soil that would affect children's health or safety. **Permits Prior to Construction:** None **Minimization Measures:** None
Visual Effects	**Conclusions:** Alternative #1 and #2 would change the setting but not the location. The setting would be changed with the introduction of built elements in Projects #1, #5, #7, and #16 and the demolition of a building necessitated by Project #7. Project #1 would result in a wider but not higher terminal and the new buildings in Projects #7 and #16 would be the same height as the new terminal. The new terminal would not exceed the visual plane created by the existing terminal. Light emissions from the terminal would be managed in the same manner as those of the existing terminal which is higher than the proposed structure. Light emissions would be managed for all projects per FAA exterior and interior lighting standards. While tree cover would be removed in

Summary of Impacts, Permits and Minimization Measures for Alternative #1 and #2

Resource Topic	Summary of Impacts, Permits and Minimization Measures
	Project #5, the proposed economy parking lot would be blocked by intervening tree stands and other buildings erected upslope and to the southeast. **Permits Prior to Construction:** None **Minimization Measures:** None
Water Resources	<u>Wetlands</u> **Conclusions:** Alternative #1 projects would fill a small (0.13-acre) herbaceous wetland (Wetland B) that occurs in the area of Project #7. This wetland provides minimal functions and values with respect to denitrification, sediment retention and biodiversity because it is isolated, regularly mowed and surrounded by active airport operations. HEF would satisfy this mitigation requirement by purchasing wetland mitigation credits, as has occurred for previous Airport improvement projects through a local mitigation bank. In Alternative #2, three small, isolated and low-quality PEM wetlands would be permanently filled, requiring a 1:1 mitigation requirement. A large PEM wetland would be temporarily impacted when it serves as a flow bypass channel for Broad Run, and one smaller wetland would be impacted for construction access. Both of these wetlands would be restored to pre-construction conditions after construction. Per correspondence with VDOT on August 25, 2025, and further requests from USEPA on September 11, 2025, an evaluation was completed for the VDOT Wetland Mitigation Site in which it was determined that it would not be impacted by the proposed project as seasonal low-flow conditions would be maintained in Broad Run. Prince William County was contacted and provided a response on October 20, 2025, indicating they would not require an RPA on any wetlands reviewed in the economy lot (Project #5) area. **Permits Prior to Construction:** Per a pre-application meeting held with VADEQ and USACE on October 23, 2025, and November 13, 2025, the aforementioned actions would be permitted under a USACE NWP or SPGP and a VADEQ IP. The existing VPDES (VAR050985) will need to be updated. **Measures Before Construction:** Erosion and Sediment Control Plan, SWPPP, SPCC Plans and ODCP. <u>Floodplains</u> **Conclusions:** For Alternative #1 and #2, impacts to the one percent annual chance floodplain would occur within existing and actively used portions of the Airport, immediately surrounding and/or between existing paved surfaces including, runways and taxiways. Any increase in flood elevations would be offset by soil removal (floodplain balancing) in uplands within the bypass channel, resulting in no net rise and no increase in the one percent annual chance flood elevation. Necessary Conditional Letter of Map Revisions (CLOMR) would be coordinated with FEMA. As such, the floodplain changes would not contribute to the loss of human life, would not carry substantial encroachment costs, nor would it result in notable adverse impacts on floodplain values.

Summary of Impacts, Permits and Minimization Measures for Alternative #1 and #2

Resource Topic	Summary of Impacts, Permits and Minimization Measures
	FEMA provided a response on August 20, 2025, indicating any floodplain coordination should occur at the local level. PWC provided a response on September 12, 2025, that no further floodplain studies are required. **Permits Prior to Construction**: Flood Hazard Use Permit with Prince William County, Coordination with City of Manassas. **Measures Before Construction**: PPC Plan <u>Surface Waters</u> **Conclusions:** No surface waters occur in the vicinity of any of the Action Alternative #1 projects. For Alternative #2, to conduct the rehabilitation work on the bridges carrying Runway 16L/34R and Taxiway Bravo over Broad Run, double-tees will be placed under the existing bridges to allow the seasonal low flow of water during construction and also separate work from the streambed. No permanent changes will occur to the bed and banks of Broad Run as it will be restored to pre-construction conditions after the bridge rehabilitation is complete. Increased impervious surfaces would be mitigated through proposed underground detention systems. The underground detention area would include drainage structures constructed in the airfield infield area between Runway 16L/34R and Taxiway Bravo. These structures would be sized to accept the expected stormwater volumes and placed and designed to meet FAA standards. This system would be incorporated into the Airport's stormwater permit. **Permits Prior to Construction**: Per a pre-application meeting held with VADEQ and USACE on October 23, 2025, and November 13, 2025, the aforementioned actions would be permitted under a USACE NWP or SPGP and a VADEQ IP. The existing VPDES (VAR050985) will need to be updated. **Measures Before Construction**: Erosion and Sediment Control Plan, SWPPP and SPCC Plans as well as an ODCP. <u>Groundwater</u> **Conclusions:** For Alternative #1 and #2, no groundwater withdrawals are proposed as part of the Project and no other anticipated activities would propose impacts to groundwater. **Permits Prior to Construction:** None **Measures Before Construction:** PPC Plan