
Chapter 2.0 Alternatives Considered

2.1 Introduction

As previously discussed in **Chapter 1.0 Purpose and Need**, the state of Michigan administers the Airport Improvement Program (AIP) grants under the Federal Aviation Administration's (FAA) State Block Grant Program (SBGP). Under the SBGP, the Michigan Department of Transportation Office of Aeronautics (MDOT AERO) is responsible for evaluating the potential environmental impacts of projects under its authority, consistent with the National Environmental Policy Act of 1969 (NEPA).

As the representative of the FAA for this project, MDOT AERO is responsible for complying with the policies and procedures of NEPA; FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*; and other related environmental laws, regulations, and orders applicable to federal actions.

FAA Order 1050.1F requires a discussion of alternatives that are reasonable and meet the purpose and need of the proposed action. An alternatives discussion should include:

- A list of alternatives considered, including the Proposed Action and the No Action alternatives;
- A concise statement explaining why any initial alternative considered was eliminated from further study because they were not considered reasonable or did not meet the purpose and need; and
- A statement identifying a Preferred Alternative if one has been identified.

This chapter documents different options that may reasonably meet the purpose and need of the proposed project at St. Clair County International Airport (Airport or PHN), as outlined in **Chapter 1.0 Purpose and Need**.

The following alternatives are presented and discussed in this chapter:

- No Action Alternative – No Removal of Current or Future Obstructions
- Build Alternatives:
 - Alternative 1 – Clear, Grub, and Grade Areas of Current and Future Obstructions in Upland and Wetland Areas in the Runway 4/22 Approaches
 - Alternative 2 – Clear, Grub, and Grade Current and Future Obstructions in Upland Areas; Clear/Cut Current and Future Obstructions with No Ground Disturbance and No Removal of Understory Trees in Wetland Areas in the Runway 4/22 Approaches (Preferred Alternative)

2.2 Approach Surface and FAA Design Standards

Tree clearing is proposed to rectify the obstructions identified to the Federal Aviation Regulation (FAR) Part 77 Imaginary Surfaces, Threshold Siting Surface (TSS), Precision Approach Path Indicator (PAPI) Light Signal Clearance Surface (LSCS) and Obstacle Clearance Surface (OCS), and State of Michigan Licensing Surface. Obstructions are not permitted to penetrate the required clear surfaces.

The approach surface is centered longitudinally on a runway and extends outward and upward from each end of the primary surface. The dimensions of the approach surface at each end of a runway are based on the type of runway and the approach for that runway end. The inner width of the approach surface is the same width as the primary surface and expands uniformly. For other than utility runways, the approach surface extends horizontally based upon the approach slope (**Figure 2.0 Approach Surface Example**). The FAA encourages airports to control the land within the approach surface to prevent hazards to landing and departing aircraft.

2.3 No Action Alternative – No Removal of Current or Future Obstructions

The No Action Alternative assumes that the existing trees identified as obstructions would continue to remain as penetrations to the FAR Part 77 Imaginary Surfaces, TSS, PAPI LSCS and OCS, and State of Michigan Licensing Surface, as presented in **Chapter 1.0 Purpose and Need**. Under this alternative, PHN would remain in its current state with no plans to remove obstructions in the Runway 4/22 approaches.

As such, the No Action Alternative does not meet the project's purpose and need of providing an air transportation facility that complies with FAA Order 5190.6B, *Airport Compliance Manual*. An airport that is not in compliance is at risk of reduced or no federal or state funding. In addition, mitigating hazards to air navigation is a critical mission for PHN, the FAA, and the MDOT AERO. For PHN to remain in compliance, PHN is required to address airspace hazards per Grant Assurance #20, Hazard Removal and Mitigation.

Although the No Action Alternative does not meet the purpose and need of the proposed action, it does serve as a baseline for comparison of environmental impacts associated with other build alternatives and is, therefore, retained for analysis and carried forward for review.

2.4 Alternative 1 – Clear, Grub, and Grade Areas of Current and Future Obstructions in Upland and Wetland Areas in the Runway 4/22 Approaches

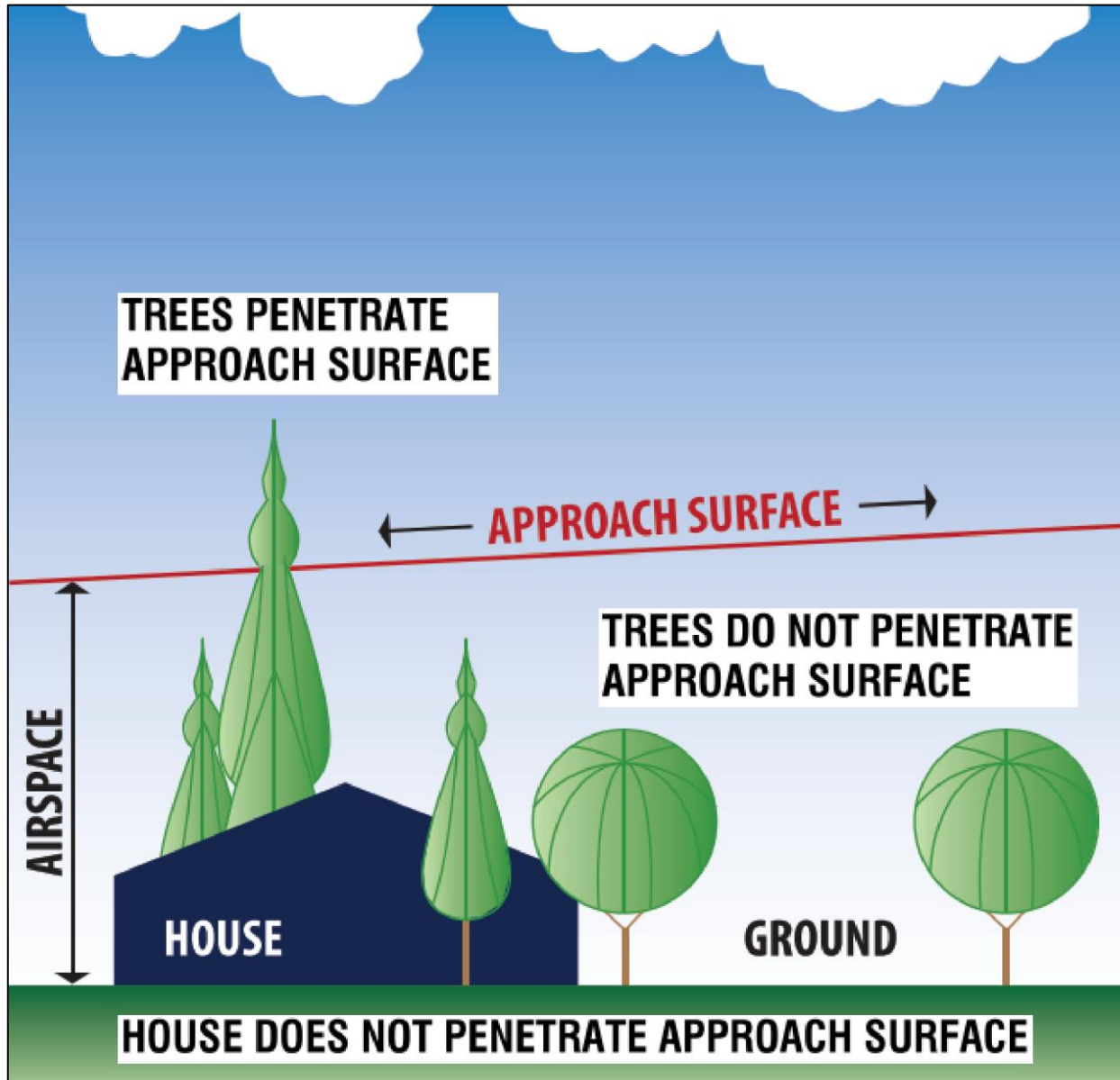
Alternative 1 proposes to clear, grub, and grade approximately 86 acres of current and future obstructions to the FAR Part 77 Imaginary Surfaces, TSS, PAPI LSCS and OCS, and State of Michigan Licensing Surface off the ends of Runway 4/22 (see **Figure 2.1 Runway 4 Obstructions** and **Figure 2.2 Runway 22 Obstructions**).

Obstructions on Airport property would be cleared first, followed by removal of identified obstructions only from private property with existing aviation easements. Easements will need to be negotiated before removal of obstructions can be accomplished on private properties without existing easements.

Under this alternative, upland and wetland areas would be cleared and graded to create a level surface, and turf grass would be planted following removal of the trees and stumps. On private property, replacement trees of a low growing variety would be planted if desired by the homeowner. This alternative would create an area that PHN can easily maintain to prevent obstructions in the future.

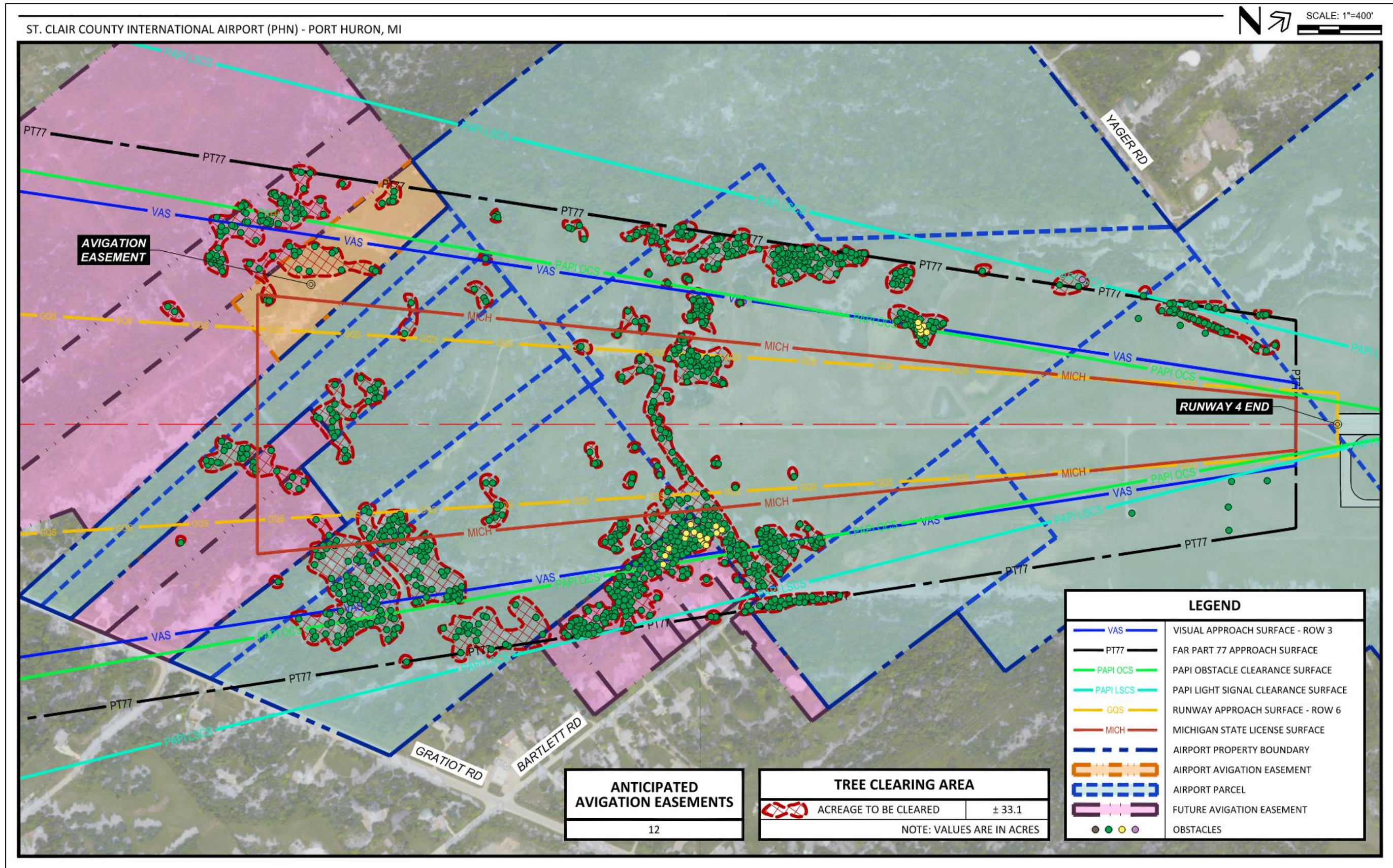
Implementation of Alternative 1 would allow PHN to remain in compliance with FAA Order 5190.6B, *Airport Compliance Manual*, and is part of PHN's ongoing effort to keep runway approaches free of potentially hazardous obstructions.

Figure 2.0 Approach Surface Example



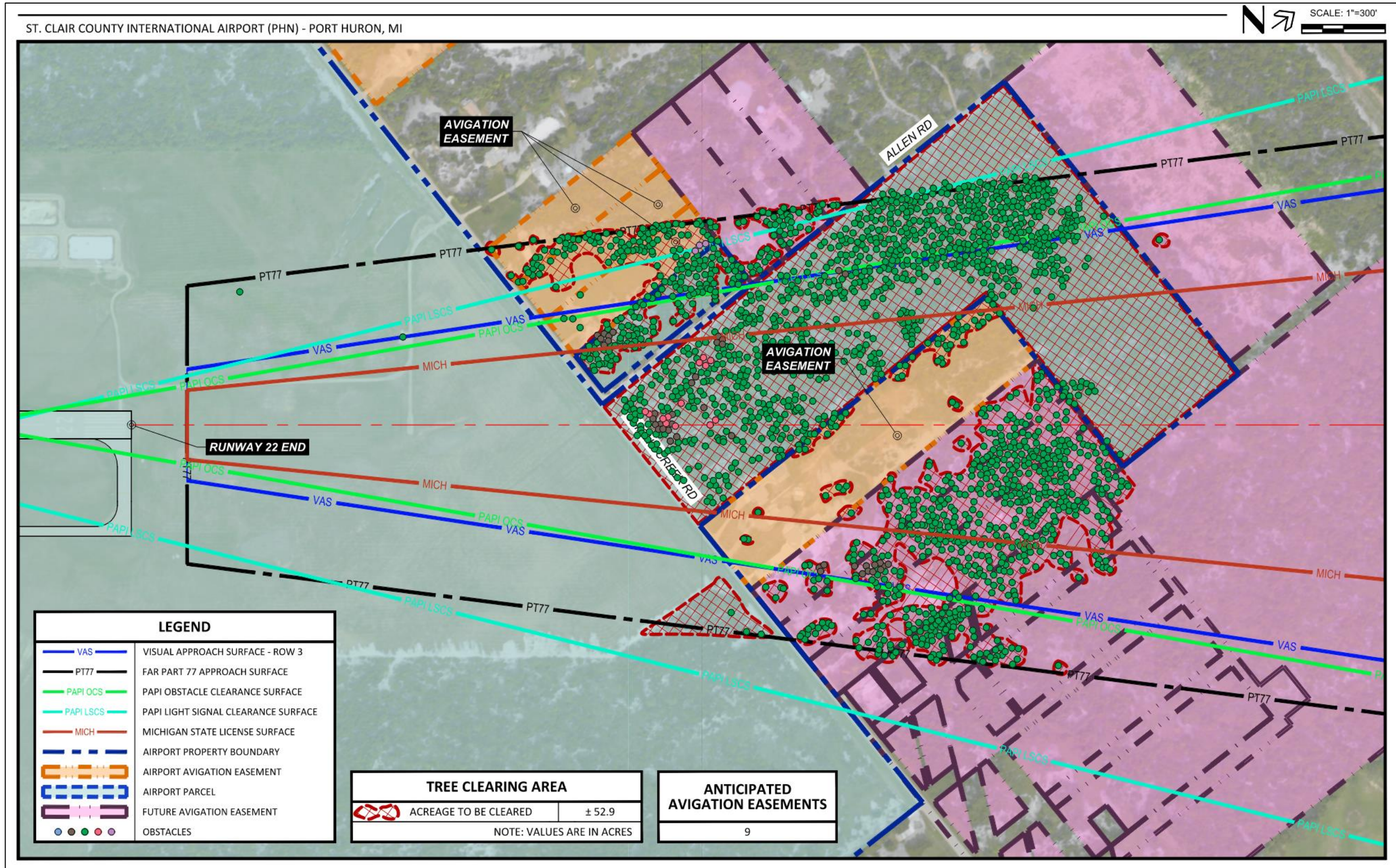
Source: Mead & Hunt, Inc.

Figure 2.1 Runway 4 Obstructions



Source: Mead & Hunt, Inc.

Figure 2.2 Runway 22 Obstructions



Source: Mead & Hunt, Inc.

Alternative 1 would have substantial impacts on wetlands due to proposed grubbing and grading activities. Field visits conducted in 2022 and 2023 to determine the presence of wetlands within the project area delineated or estimated a total of 105.549 acres of wetlands (66.024 acres of forested wetlands and 39.525 acres of scrub shrub, emergent, shallow marsh, excavated pond, and excavated ditch wetlands). Mitigation would be required for all wetland areas impacted by grubbing and grading activities and would include a Michigan Department of Environment, Great Lakes, and Energy (EGLE) Part 303 Wetland Protection Permit and the purchase of wetland credits at an EGLE approved mitigation bank within the same watershed. A total of 191.335 acres of mitigation is expected to offset impacts to area wetlands. Mitigation would consist of 132.048 acres of forested wetland impacts at a 2:1 ratio and 59.287 acres for all other wetland types at a 1.5:1 ratio.

In addition to wetland impacts, surrounding forest cover and potentially suitable roost trees for the Tricolored Bat (TCB) and the Little Brown Bat, both of which are listed as threatened by the State of Michigan, exist within the project area. The TCB is also proposed for federal listing as endangered under the Endangered Species Act of 1973. However, consultation with the U.S. Fish and Wildlife Service (USFWS) indicates tree removal restrictions as the appropriate mitigation. Tree removals would be restricted from May 15 through July 31. In addition, selective tree removals (i.e., individual trees) would be employed to the greatest extent possible, especially in areas where the obstruction density is low or in upland areas on private property with avigation easements.

Suitable habitat for the Eastern Massasauga Rattlesnake (EMR) is also present within the portion of the project area located outside the perimeter fence at the approach end of Runway 4 and could be impacted under Alternative 1. Appropriate mitigation would be implementation of recommended best management practices (BMPs) for projects within the known EMR range.

The total cost to implement Alternative 1 is estimated at \$25.3 million (\$4.3 million for construction and \$21.0 million for wetland mitigation), which is considerably more expensive than Alternative 2.

Advantages of this alternative:

- It meets the project's purpose and need.
- Clearing, grubbing, and grading of approximately 86 acres of tree obstructions would significantly reduce the need to maintain vegetation in the future within the project area.

Disadvantages of this alternative:

- It requires avigation easements over 21 parcels to remove obstructions to the approach surface.
- Potentially significant impacts to wetlands are expected since wetland areas within the project area would be cleared, grubbed and graded.
- It requires an EGLE Part 303 Wetland Protection Permit and purchase of wetland credits at an EGLE-approved mitigation bank.
- The alternative could have impacts to the TCB, Little Brown Bat, and EMR.
- It is the most expensive of the build alternatives.

Although Alternative 1 meets the project's purpose and need and provides a long-term solution to vegetation management in the Runway 4/22 approaches, it is not considered a reasonable alternative because it would have extensive impacts on wetlands. It would also be the most expensive option to implement.

2.5 Alternative 2 – Clear, Grub, and Grade Current and Future Obstructions in Upland Areas; Clear/Cut Current and Future Obstructions with No Ground Disturbance and No Removal of Understory Trees in Wetland Areas in the Runway 4/22 Approaches (Preferred Alternative)

Under Alternative 2, approximately 86 acres of current and future obstructions to the FAR Part 77 Imaginary Surfaces, TSS, PAPI LSCS and OCS, and State of Michigan Licensing Surface would be cleared off the ends of Runway 4/22 (see **Figure 2.1 Runway 4 Obstructions** and **Figure 2.2 Runway 22 Obstructions**).

Similar to Alternative 1, obstructions on PHN property would be cleared first. These areas would be followed by removal of identified obstructions only from private property with existing avigation easements. As previously explained, avigation easements only allow for the removal of identified obstructions. Easements would be negotiated before obstruction removals can be completed on private properties without existing easements.

Grubbing and grading activities under this alternative would occur only in upland areas. Once the trees are cut and the stumps are grubbed, upland areas would be graded as needed to create a level surface, and replacement turf grass would be planted. On private property, replacement trees of a low growing variety would be planted if desired by the homeowner. This alternative would create upland areas that PHN can easily maintain to prevent obstructions in the future.

In wetland areas, trees identified as current and future obstructions would be cleared, and stumps and understory trees would remain with no ground disturbance. Since stumps and understory trees would remain in the wetland areas, this alternative would create lowland areas that PHN would have to periodically maintain to prevent regrowth in the future.

Similar to Alternative 1, implementation of Alternative 2 would allow PHN to remain in compliance with FAA Order 5190.6B, *Airport Compliance Manual*, and this alternative is part of PHN's on-going effort to keep its runway approaches free of potentially hazardous obstructions.

Alternative 2 would avoid mitigation of impacts to wetlands since no ground disturbance would occur, and no understory trees would be removed in wetland areas. As previously explained, field visits conducted to determine wetland boundaries delineated or estimated a total of 105.549 acres of wetlands in the project area (66.024 acres of forested wetlands and 39.525 acres of scrub shrub, emergent, shallow marsh, excavated pond, and excavated ditch wetlands). Recent consultation with EGLE indicates that a one-time removal of trees as proposed under Alternative 2 along with no ground disturbance and no removal of understory trees in wetland areas would require no mitigation of impacts to wetlands. A Part 303 Wetland Protection Permit from EGLE would still be required, however.

Alternative 2 would have potentially fewer impacts to the TCB, Little Brown Bat, and EMR than Alternative 1 given no ground disturbance and no removal of understory trees in wetland areas. USFWS bat mitigation is tree removal restrictions (tree removals would be restricted from May 15 through July 31) and selective tree removals for the bat species and implementation of BMPs for the EMR.

Alternative 2's estimated cost is approximately \$3.9 million for construction, which is considerably less expensive than Alternative 1.

Advantages of this alternative:

- It meets the project's purpose and need.
- It provides a long-term solution to vegetation maintenance in upland areas.
- It has considerably fewer impacts to wetlands.
- It avoids mitigation of impacts to wetlands.
- It is the least expensive of the build alternatives.

Disadvantages of this alternative:

- It requires avigation easements over 21 parcels to remove obstructions to the approach surface.
- It requires ongoing vegetation maintenance in lowland areas.
- It requires a Part 303 Wetland Protection Permit from EGLE.
- It will still have impacts to the TCB, Little Brown Bat, and EMR but fewer than Alternative 1.

Alternative 2 is a reasonable alternative because it meets the project's purpose and need, provides a long-term solution to vegetation management in upland areas, avoids mitigation of impacts to wetlands, and is the least expensive of the build options.

2.6 Comparison of Alternatives

Table 2-0 Summary of Alternatives Comparison provides an overview of each alternative. Categories of interest are presented for each build alternative with the No Action Alternative shown for comparison purposes. Only categories reasonably expected to be impacted by the project were included in the comparison table. For a detailed discussion of potential environmental impacts of the No Action Alternative and Preferred Alternative, see **Chapter 3.0 Affected Environment and Environmental Consequences**.

2.7 Selection of the Preferred Alternative

After a thorough analysis of the advantages and disadvantages of each alternative, the alternative that best meets the project's purpose and need is **Alternative 2 – Clear, Grub, and Grade Current and Future Obstructions in Upland Areas; Clear/Cut Current and Future Obstructions with No Ground Disturbance and No Removal of Understory Trees in Wetland Areas in the Runway 4/22 Approaches (Preferred Alternative)**.

Although both build alternatives meet the project's purpose and need, Alternative 2's primary advantage is that it avoids mitigation of impacts to wetlands, since grubbing and grading activities would be confined to

upland areas only and understory trees would remain in wetland areas. Alternative 2 is subsequently much less expensive to implement than Alternative 1.

Table 2-0 Summary of Alternatives Comparison				
Category	Criteria	No Action Alternative	Alternative 1	Alternative 2 (Preferred Alternative)
Meets Project Purpose and Need	Removes Obstructions within the FAR Part 77 Imaginary Surfaces, TSS, PAPI LSCS and OCS, and State of Michigan Licensing Surface	No	Yes	Yes
Environmental Impacts	Impacts to Wetlands	No	High	Low
	Requires Mitigation of Impacts to Wetlands	No	Yes	No
	Potential Impacts to Biological Resources	No	Yes	Yes
Vegetation Management	Provides Long-Term Solution to Obstruction Removals in Upland Areas	No	Yes	Yes
	Provides Long-Term Solution to Obstruction Removals in Lowland Areas	No	Yes	No
Implementation Factors	Requires Acquisition of Avigation Easements Over 21 Parcels with Obstructions in the Runway 4/22 Approaches	No	Yes	Yes
Cost	Estimated Cost to Implement	\$0	\$25.3 million	\$3.9 million
The colors "green" and "red" represent a specific impact category considered to have the least (green) or the most (red) quantity of expected impacts when compared to the other build alternative.				
Source: Mead & Hunt, Inc.				

Similar to Alternative 1, Alternative 2 would have potential impacts on the TCB, Little Brown Bat, and EMR but given no ground disturbance and no tree understory removals, fewer impacts are expected. However, any impacts would be easily mitigated through tree removal restrictions and selective tree removals for the TCB and Little Brown Bat and implementation of BMPs for the EMR.

Lastly, Alternative 2 would not provide a long-term solution to vegetation management in lowland areas, but this criterion is outweighed by the need to minimize environmental impacts to wetlands.

Based on the analysis presented above, Alternative 2 is considered the most reasonable alternative. As a result, Alternative 2 is carried forward in this Environmental Assessment for additional analysis, public comment, and agency review.