ENVIRONMENTAL EVALUATION (Short Form Environmental Assessment) for AIRPORT DEVELOPMENT PROJECTS

FEDERAL AVIATION ADMINISTRATION
MEMPHIS AIRPORTS DISTRICT OFFICE-SOUTHERN REGION
AIRPORTS DIVISION

Airport Name: Memphis International Airport (MEM)
Airport Location: 2491 Winchester Road, Memphis, TN 38116
Proposed Project: FedEx MEMH Relocations, Project # 8648976
Date: October 26, 2017

This Environmental Assessment becomes a Federal document when evaluated and signed by the responsible FAA official.

Responsible FAA Official: Date:

FAA MEM-ADO, SOUTHERN REGION AIRPORTS DIVISION
ENVIRONMENTAL EVALUATION FORM
FOR SHORT ENVIRONMENTAL ASSESSMENTS

The Short Form Environmental Assessment (EA) is based upon the guidance in Federal Aviation Administration (FAA) Order 5050.4B, "National Environmental Policy Act, Implementing Instructions for Airport Projects" or subsequent revisions, which incorporates the Council on Environmental Quality's (CEQ) regulations for implementing the National Environmental Policy Act (NEPA), as well as the US Department of Transportation environmental regulations (including FAA Order 1050.1E or subsequent revisions), and many other federal statutes and regulations designed to protect the Nation's natural, historic, cultural, and archeological resources. This version of the Short Form EA should be used only for projects at federally obligated airports that fall within the boundaries of the Memphis Airports District Office (MEM-ADO).

The Short Form EA is intended to be used when a project cannot be categorically excluded (CATEX) from formal EA, but when the environmental impacts of the proposed project are expected to be insignificant and a detailed EA would not be appropriate. Accordingly, this form is intended to meet the intent of a short EA while satisfying the regulatory requirements of an EA.

Proper completion of the Short Form EA would allow the FAA to determine whether the proposed airport development project can be processed with a short EA, or whether a more detailed EA must be prepared. The MEM-ADO normally intends to use a properly completed Short Form EA to support a Finding of No Significant Impact (FONSI).

Applicability
The Short Form EA should be used if the sponsor's proposed project meets the following two (2) criteria:

1) The proposed project is a normally categorically excluded action that may include extraordinary circumstances listed in Table 6-3, paragraph 702.a of Order 5050.4B or the airport action is one that normally requires an EA but involvement with, or impacts to, the extraordinary circumstances are not notable in number or degree of impact, and that any significant impacts can be mitigated below the level of significance, per Order 5050.4B, Table 7.1.

2) The proposed project must fall under one of the following categories of Federal Airports Program actions noted with an asterisk (*):

(a) Approval of an airport location (new airport).
*(b) Approval of a project on an airport layout plan (ALP).
*(c) Approval of federal funding for airport development.
*(d) Requests for conveyance of government land.
*(e) Approval of release of airport land.
*(f) Approval of the use of passenger facility charges (PFC).
*(g) Approval of development or construction on a federally obligated airport.

Do any of these listed Federal Airports program action(s), 2(b) - (g), apply to your project? Yes __X__ No** _____ If "yes," list them here (there can be more than one). (b)

2(b) Approval of a project on an ALP.
2(g) Approval of development or construction on a federally obligated airport.

If "no," see (**) below.

**** If the proposed project does not meet 1) or 2) above, i.e., one or more answers to the questions resulted in a (**), do not complete this Form. Rather, contact the Environmental Protection Specialist at the Memphis Airports District Office for additional guidance.**

Instructions

Prior to preparing any NEPA documentation, including the Short Form EA, the MEM-ADO encourages you to contact the Environmental Protection Specialist or Program Manager to ensure that the Short Form EA is the proper Form for your proposed action. Completed forms without prior MEM-ADO concurrence may result in approval delays or rejected NEPA documentation.

To complete the Form, the preparer should describe the proposed project and provide information on any potential impacts of the proposed project. Accordingly, it will be necessary for the preparer to have knowledge of the environmental features of the airport. In addition, while the preparer should have knowledge of the airport and associated features, correspondence with federal, state, and local regulatory agencies should be completed, when appropriate, to ensure that protected environmental resources are identified in the study area. In cases where regulatory agency coordination is appropriate, the preparer should submit a project description and drawing to the Environmental Protection Specialist for concurrence prior to submitting the project proposal to outside agencies.

Correspondence from federal, state, and local agencies, project plans or maps, or secondary environmental studies should be included as an appendix to this form.

It is important to note that in addition to fulfilling the requirements of NEPA through this evaluation process, the FAA is responsible for ensuring that airport development projects comply with the many laws and orders administered by the agencies protecting environmental resources. The form is not meant to be a stand-alone document. Rather, it is intended to be used in conjunction with applicable orders, laws, and guidance documents, and in consultation with the appropriate resource agencies.

Complete the following information:

1. Project Location:
Airport Name: Memphis International Airport
Airport Address: 2491 Winchester Road
City: Memphis County: Shelby State: Tennessee

2. Airport Sponsor Information:
Point of Contact: James Hay, Director of Development, Memphis-Shelby County Airport Authority
Address: 2491 Winchester Road, Suite 113, Memphis, TN
Telephone: 901.922.8224 Fax: 901.922.8211
E-mail: jamesh@mscaa.com

3. Evaluation Form Preparer Information:
Point of Contact: Charles Pace, NewFields Engineering and Environmental, LLC
Address: 3230 Maiden Lane, Suite 3 Manchester, MD 21102
Telephone: 443 291 6185 Fax: 443.744.2591
E-mail: cpace@newfields.com

4. Proposed Development Action (describe **ALL** associated projects that are involved):

FedEx Express (FedEx) is proposing a project to update and modernize its facilities at the Memphis International Airport (MEM) in Memphis, Tennessee (proposed project or proposed action). Figure 1 in Appendix B shows the airport location. An outdated package sorting facility would be replaced with facilities specifically designed to accommodate modernized, more efficient equipment compatible with its current aircraft fleet. At its core, the purpose of the project is to replace operations, structures and equipment that are approaching the end of their useful life with modern operations, structures and equipment to improve the efficiency of FedEx's business processes. New structures would be constructed using green building standards to the extent feasible to limit environmental impacts. The project would be constructed in Phases as funding becomes available. First, buildings 1-23 would be demolished and the slabs removed. Next, FedEx would construct the facilities listed below. Finally, after the Secondary 25 sorting facility becomes operational, the Secondary 1-4 would be demolished.

Under the Proposed Development Action, FedEx would deconstruct or demolish 24 outdated structures at MEM and construct several new facilities. The structures to be demolished or deconstructed are:

1. Hangar #6 (Building 2879)
2. Hangar #7 (Building 2837)
3. Admin (Building 2861)
4. GSE (Building 3099)
5. Southwide A
6. Southwide B
7. Southwide C

8. Southwide D
9. Southwide E
10. Southwide F
11. Southwide G
12. Building 2860
13. Building 2878
14. Building 2884
15. Building 2875
16. Building 2855
17. Building 2825
18. Building 2838
19. Building 2852
20. Building 380
21. Building 382
22. Building 2826
23. Building 2854
24. North Secondary 1-4

Under the proposed action, FedEx would construct the following new facilities:

1. Secondary 25 Building – The Secondary 25 sorting facility would have a footprint of approximately 328,000 sq. ft. The building would be 90-100 feet tall and consist of four levels of sort conveyors, process equipment and office space. The exterior of the building would consist of insulated metal panels, translucent wall panes, and dynamic glazing. Plans are to have the building LEED-certified. The structure would be built south of Sprankel Avenue and north of the North Input structure, and would replace the existing North Secondary 1-4 facility. Its site encompasses all of the current Hangar 7 and Admin Building sites, and part of the Hangar 6 site.
2. Matrix/Secondary 25 Bridge – This would be a new 25,000 sq. ft. conveyor (box truss) bridge extending from the existing East and West Matrix to the new Secondary 25 building. The Matrix/Secondary 25 Bridge would be conditioned and enclosed with the same exterior material system as the other new facilities.
3. Bulk Truck Load (BTL) Building – This would be a new, 65,000 sq. ft. building and contain an automated sort system. The building would be approximately 50-60 feet tall and consist of two levels of sort conveyors, process equipment and office space. The BTL building would be enclosed with the same exterior material system as described for the Secondary 25 building, and is also planned to be LEED-certified.
4. Secondary 25/BTL Bridge – This would be a new conveyor (box truss) bridge, approximately 10,000 sq. ft. that extends from the Secondary Sort Building to the new BTL Building. The Secondary 25/BTL Bridge would be conditioned and enclosed with the same exterior material system as the new facilities.
5. Ground Support Equipment (GSE) Maintenance Facility – This would be a new, 6,000 square-foot facility used for maintenance of ground support equipment (GSE). Design of the new structure is not yet complete, but it would be a single story of no more than 30 feet in height. It would be an open space with a slab floor, and would include some storage

of lubricants and other items used for routine preventative maintenance of the GSE vehicle fleet, especially oil changes, and also for minor repairs.

Once the Secondary 25 and BTL facilities and sort systems are fully operational, FedEx would deconstruct/demolish the North Secondary 1-4 (2899) facility down to slab level, totaling approximately 167,000 sq. ft. At this time FedEx has no plans regarding the remaining slab. The structures that would be demolished or deconstructed, and the proposed newly constructed structures are shown on Figure 2 in Appendix B.

To guide the demolition and deconstruction process, FedEx and its contractors would first prepare a Demolition/Deconstruction Waste Management Plan certified under the Leadership in Energy and Environmental Design (LEED) certification program. The 24 structures and associated slabs would be assessed for the potential to recycle the building materials to the extent feasible, and those portions of the structures would be deconstructed to maintain the value of the recycled materials. Materials with no recycled value would be assessed for hazardous materials content and disposed of in an appropriate landfill. The demolition, deconstruction, and construction contractors would employ industry-standard best management practices (BMPs) that would minimize environmental and human health impacts to the maximum extent feasible.

5. Describe the Purpose of and Need for the Project:

a. Purpose

The purpose of the proposed project is to upgrade and modernize the FedEx Memphis World Hub, which has developed over a 44-year period. During that time, technology and sort systems have improved exponentially, security demands have increased, competition has increased, and upgrading and modernization have become a necessity to sustain the MEM position as FedEx's premier hub. The proposed action would modernize package sorting facilities and improve traffic flow through the FedEx Memphis hub. Overall efficiency would be improved at MEM by eliminating outdated, inefficient facilities, some of which have been vacant for many years, and establishing new staging areas, which would segregate truck movements from the flow of ground service equipment.

The Secondary 25 facility would be designed to optimize the configuration of the sort system, maximizing efficiency. It would replace the Secondary 1-4, a facility that FedEx took over and retrofitted decades ago. The facility is small and presents significant challenges to processing the many types of the containers that are now used in FedEx aircraft.

The proposed action would also be designed to allow more efficient flow of ground support vehicles within the sort and loading areas, reducing congestion. Use of the two bridges described above, for example, would allow more efficient flow by allowing GSE vehicles to travel below the bridges while parcels are moved on conveyor belts over the bridge to the next facility. The project would be designed to LEED standards, increasing employee comfort by improving lighting and climate control, while minimizing environmental impacts. Any new

structures would use modern building materials and sorting equipment that would contribute to an increase in operational and energy efficiency and reliability of operations compared to the present configuration.

b. Need

MEM is currently the premier hub for FedEx operations worldwide. FedEx processes several million parcels per day at MEM during peak season, and loads, unloads, and services several hundred aircraft and vehicles operating from the airport daily. FedEx current facilities are operating at maximum capacity during peak periods, such as the days leading up to the holiday period in December. The existing Secondary 1-4 building and equipment are decades old and present ongoing challenges for the processing of cargo from all types of FedEx aircraft. Upgrades are needed in order to improve the efficiency and reliability of operations. The proposed project would also increase worker comfort and productivity, leading to improved employee retention.

6. Alternatives to the Project: Describe any other reasonable actions that may feasibly substitute for the proposed project, and include a description of the "No Action" alternative. If there are no feasible or reasonable alternatives to the proposed project, explain why:

Alt. # 1:No action alternative was considered in this EA for the project.

No Action Alternative: Under the No Action Alternative the demolition, deconstruction, and new construction activities described previously would not occur, and the efficiency and improvements of the proposed action would not be realized resulting in a potential shift in volumes to other airports.

Explanation: Potential alternatives to the project could include a different project location or changes in the design layout (i.e. in the number of structures demolished or deconstructed and/or a change in the number of structures constructed). Within the Memphis airport, locating the new secondary sort building anywhere else within the FedEx Hub or reconfiguring the design would cause processing times to increase rather than decrease, which undermines the primary goal of the project. The proposed action is an optimal design for better utilizing available land and increasing reliability and efficiency of operations, especially at peak operation periods. The proposed action also better utilizes available land, and as shown below, public health or environmental impacts from the proposed action would be negligible; therefore, the proposed action is the only alternative considered in this Short Form EA.

7. Describe the affected environment of the project area (terrain features, level of urbanization, sensitive populations, etc). Attach a map or drawing of the area with the location(s) of the proposed action(s) identified. Attachment? Yes___X__ No_____

The work is planned within FedEx's complex in the northern portion of the airport, which has been used for FedEx operations since 1973. The existing structures and the approximate location of the proposed new facilities are shown in Figure 2 of Appendix B. As is typical for large urban airports, the project area is characterized by commercial or industrial land uses

consisting of commercial warehouse buildings, airplane hangars, smaller buildings, and roads, taxiways, and runways. There are no natural or unique features within the airport property. Small areas of landscaping are adjacent to or near some of the buildings targeted for demolition, and Hurricane Creek runs as close as 100 feet from buildings that are targeted for demolition. Hurricane Creek extends under the airport through a tunnel before emerging in a concrete-lined channel near the Southwide buildings. It then enters a more natural channel as it leaves the airport property and joins Nonconnah Creek about 2,000 feet north of the project area. Other than the Nonconnah Creek corridor, the area outside the airport is dominated by parking lots and large commercial and industrial facilities.

8. Environmental Consequences – Special Impact Categories (refer to corresponding sections in 5050.4B or 1050.1E, or subsequent revisions, for more information and direction to complete each category, including discussions of Thresholds of Significance Table 7-1).

(1) NOISE

1) Does the proposal require a noise analysis per Order 1050.1E, Appendix A? Explain. (Note: Noise sensitive land uses are defined in Table 1 of FAR Part 150). Yes ____ No __X__

2) If "yes," determine whether the proposed project is likely to have a significant impact on noise levels over noise sensitive areas within the DNL 65 dBA noise contour.

The proposed project would not increase ground or air operations and therefore would have no long-term adverse effect on airport operations or noise levels. Noise generated by building demolition and removal would be localized, short term, and temporary. This noise would be secondary to the existing noise sources in the project area, which include airport operations, aircraft traffic, freight-handling equipment, and nearby roads and highways. Additionally, because the area is zoned for an airport, no sensitive receptors are near the project area. The nearest sensitive receptor is more than 0.75 mile from the project area.

(2) COMPATIBLE LAND USE

(a) Would the proposed project result in other (besides noise) impacts exceeding thresholds of significance that have land use ramifications, such as disruption of communities, relocation of residences or businesses, or impact natural resource areas? Explain.

No. The proposed project area is located on airport property within the Airport Operations Area (AOA), and no land use would change as a result of the project. Areas affected by the project are currently in use for providing ground support for FedEx operations, and that use would not change with the completion of the project. There would be no disruption of communities or relocation of businesses or residences.

(b) Would the proposed project be located near or create a wildlife hazard as defined in FAA Advisory Circular 150/5200-33B "Hazardous Wildlife Attractants on or Near Airports"? Explain.

The proposed project, at its fullest, involves removal of 24 outdated structures at MEM and the construction of several new structures on the site of some of the removed structures. The

project would not create a new wildlife hazard or exacerbate an existing wildlife hazard at MEM.

(3) SOCIAL IMPACTS

(a) Would the proposed project cause relocation of any homes or businesses? Yes____
No __X__ Explain.

No. The proposed project area is located on MEM airport property entirely within FedEx's portion of the AOA; therefore, there would be no disruption of communities or relocation of businesses or residences.

(b) If "yes," describe the availability of adequate relocation facilities

_____
_____
_____
_____

(c) Would the proposed project cause an alteration in surface traffic patterns, or cause a noticeable increase in surface traffic congestion? Explain.

Local traffic would not be noticeably increased due to airport construction traffic.

(4) INDUCED SOCIOECONOMIC IMPACTS

Would the proposed project cause induced, or secondary, socioeconomic impacts to surrounding communities, such as change business and economic activity in a community; impact public service demands; induce shifts in population movement and growth, etc.?
Yes____ No __X__

Explain: Adverse impacts are not expected because the proposed action would affect internal airport conditions only and is not expected to change business or economic activity in the community. The planned work would likely have a beneficial socioeconomic effect during construction because of employment of construction workers for demolition, deconstruction and construction activities, and because of purchases of supplies and services from local businesses for the planned work. Furthermore, the proposed action would allow for the Hub to continue as a premier hub in the FedEx network, contributing to economic health of the greater Memphis area.

(5) AIR QUALITY

(a) Does the proposed project have the potential to increase airside or landside capacity, including an increase in capacity to handle surface vehicles? Explain

The project would not increase landside or airside capacity, as FedEx is not adding flights or increasing ground vehicle activity in relation to this project.

(b) Identify whether the project area is in a non-attainment or maintenance area for any of the criteria air pollutants having National Ambient Air Quality Standards (NAAQS) established

under the Clean Air Act Amendments (CAAA), and identify which pollutant(s) apply. If the proposed project is in an attainment area, no further air quality analysis is needed; skip to item (6). See EPA Green Book at www.epa.gov/oar/oaqps/greenbk for current attainment areas.

As of July 25, 2016, the County is in attainment with all federal air quality standards, though it is in maintenance status for 8-hour ozone and carbon monoxide (CO).

(c) Is an air quality analysis needed with regard to indirect source review requirements or levels of aircraft activity (See Order 1050.1E and the 1997 FAA Handbook "Air Quality Procedures for Civilian Airports and Air Force Bases"). Explain. If “yes,” comply with state requirements.

The state of Tennessee does not require indirect source review.

(d)(1) Would the proposed action be an “exempted action,” as defined in 40 C.F.R Part 51.853(c)(2) of the General Conformity Rule? If exempt, skip to item (6). List exemption claimed.

The project does not meet the definition of actions that are exempt under the General Conformity Rule (40 Code of Federal Regulations [CFR] 93.153[c][2]).

(d)(2) Would the increase in the emission level of the regulated air pollutants for which the project area is in non-attainment or maintenance exceed the de minimis standards?
Yes _____ No__X___

An air quality analysis using the Airport Construction Inventory Tool (ACEIT), version 1.0 was performed for the proposed action. Estimates were produced for emissions from engine-powered construction equipment, worker commutes, material transport, fugitive dust during demolition and construction (particulate matter less than 10 microns [PM_{10}] and less than 2.5 microns [$PM_{2.5}$]), and evaporative/volatilization emissions.

A Level 1 assessment, which provides a conservative estimate, was first performed to determine if detailed modeling inputs were required to refine the data. The estimated emissions were well below de minimis thresholds, with the exception of carbon monoxide. Investigation of the default parameters indicated that the assumed value for vehicle miles travelled (VMT) associated with the commuting of construction employees was significantly higher than is anticipated for the project. The construction of the Secondary 25 and Bulk Truck Load (BTL) buildings were the largest contributors. Using default values the Level 1 assessment assumed that greater than 1,700 employees would commute a round trip distance of 40 miles daily for the calculation of VMT. However, the maximum number of employees for the proposed action would be 1,000 employees per day. Therefore, the VMT parameters for the Secondary 25 and BTL buildings were adjusted to reflect a more realistic representation of commuter miles.

Emissions were calculated on an annual basis to represent air quality throughout the demolition/deconstruction/construction period for the proposed project. The regulatory de

minimis thresholds are in terms of annual emissions (tons per year). The year 2022 was selected as the test year because it is scheduled to be the last complete year (January through December) of the proposed action. Tasks that are scheduled for less than one year were projected on an annual basis to represent conservative estimates of emissions.

Emissions from demolition of buildings and slabs were calculated based on building dimensions and the cost of the project. Ceiling and roof thickness was assumed to be 2 feet to calculate open space height. This approach overestimates emissions, as the model calculates the volume of construction material per floor based on the building's square footage and ceiling/roof thickness. Project costs for demolition activities were apportioned based on annual square footage or applicable timeframes.

The ACEIT model estimates emissions from building construction based on size categories and project costs. There are four size categories for general building construction. The category that was most representative of each individual building was selected. Project costs for construction activities were apportioned based on applicable timeframes of construction for each building.

A detailed inventory of estimated emissions caused by project demolition and construction is attached as Appendix C. The calculated emissions for ozone precursors (nitrogen oxides [NOx] and volatile organic compounds [VOC]), CO, PM_{10}, and $PM_{2.5}$ were below the applicable General Conformity *de minimis* thresholds established by the Clean Air Act (40 CFR 93.153[b]). The projected emissions of CO are predominantly driven by employees commuting to the project site. The analysis conducted was purposely driven to capture the greatest potential for impact, resulting in a conservative estimate of emissions.

Project Emissions of Criteria Air Pollutants and *De Minimis* Thresholds

	VOC (TPY)	**NOx (TPY)**	**CO (TPY)**	**PM_{10} (TPY)**	**$PM_{2.5}$ (TPY)**	**SO_2 (TPY)**
De Minimis Threshold[1]	100	100	100	100[2]	100[2]	100[2]
Project Emissions	6.19	12.5	89.9	1.72	0.69	0.09

CO – carbon monoxide
NOx – nitrogen oxides
PM_{10} – particulate matter less than 10 microns in diameter
$PM_{2.5}$ – particulate matter less than 2.5 microns in diameter
SO_2 – sulfur dioxide
TPY – tons per year
VOC – volatile organic compounds
[1] 40 CFR 93.153(b)(2) – Standards for maintenance areas
[2]Thresholds for particulate are shown for demonstration purposes. Shelby County is in attainment for PM_{10} and $PM_{2.5}$.

(d)(3) If "no," would the proposed project cause a violation of any NAAQS, delay the attainment of any NAAQS, or worsen any existing NAAQS violation? Explain.

Conformance with the State Implementation Plan (SIP), as described below, indicates compliance with the NAAQS for ozone, VOCs, NOx, CO, PM_{10}, $PM_{2.5}$, and SO_2.

(d)(4) Would the proposed project conform to the State Implementation Plan (SIP) approved by the state air quality resource agency? Explain, and provide supporting documentation.

The project is presumed to conform to the SIP since the calculated emissions are below *de minimis levels*. A complete emissions inventory is available for review.

(6) WATER QUALITY

Describe the potential of the proposed project to impact water quality, including ground water, surface water bodies, any public water supply systems, etc. Provide documentation of consultation with agencies having jurisdiction over such water bodies as applicable.

Two receiving streams are in the vicinity of the project area. Nonconnah Creek is located to the north of the project area, approximately 1,500 feet away at its closest point, and flows to the west to McKellar Lake and the Mississippi River. Hurricane Creek flows from the south to north under MEM and discharges into Nonconnah Creek. Stormwater from the project area flows into these two receiving waters as follows:

- Hurricane Creek Drainage Area:
  - Existing: Admin building 2861, Hangar #6, Hangar #7, GSE Building 3099, Southwide A, B, C, D, E, F and G, and Buildings 2884, 2838 and 2852.
  - New: Secondary 25.
- Nonconnah Creek Drainage Area:
  - Existing: Buildings 2860, 2878, 2875, 2855, and 2825.
  - New: Bulk Truck Load Facility.

No part of the project would be conducted within the receiving waters; however, both drainage areas contain storm drains that convey stormwater to the identified receiving waters. As required by National Pollutant Discharge Elimination System (NPDES) permit TN0067351, stormwater discharges to Nonconnah and Hurricane Creeks are currently regulated and FedEx maintains a Storm Water Pollution Prevention Plan (SWPPP), which requires inspections at least every 72 hours by a Level 1 certified inspector to minimize impacts to water resources. Prior to commencement of demolition or construction activities, FedEx would submit a completed and signed Notice of Intent (NOI) for Construction Activity - Stormwater Discharges to the Tennessee Department of Environment and Conservation (TDEC) Division of Water Resources. FedEx would also develop and submit a site-specific SWPPP with the NOI.[1]

During demolition, deconstruction, and construction, the following steps would be taken to minimize the potential for pollutants (sediment, building materials, trash, and debris) to be discharged to the storm sewer:

2 Information for Construction Activity - Stormwater Discharge permitting in Tennessee can be found at https://www.tn.gov/environment/article/permit-water-stormwater-permitting-program.

- Install sediment controls such as filter berms and silt fences around storm drains to capture and retain mobilized debris and sediment. Such devices would be periodically inspected and retained material would be removed to maintain proper operation of the controls.
- Minimize dust generation through the application of water or other dust suppression techniques.
- Minimize stockpiles of material.

The proposed project would not increase the amount of impervious area. Thus, there would be no increase to stormwater runoff from the project area. The buildings have been surveyed for hazardous material; any identified hazardous material would be removed prior to demolition. All of the planned demolition and construction work is located within currently recognized and regulated drainage basins. The Tennessee Department of Environment and Conservation would be notified of demolition, deconstruction, and construction activity within these drainage basins; therefore, no violations of any water quality standards are expected.

(7) DEPARTMENT OF TRANSPORTATION SECTION 303/4(f)

The proposed project would adversely affect four Section 4(f) properties that are potentially eligible for inclusion in the National Register of Historical Places (NRHP). As shown in the attached Draft Section 4(f) Evaluation (Appendix D), the proposed undertaking would alter characteristics of the historic properties that render them potentially eligible for the National Register of Historic Places. It is the opinion of the consultants that the proposed project would have an adverse effect on the potentially eligible properties addressed in this historic resources survey through demolition, which would constitute a use of Section 4(f) properties in the project area.

(8) HISTORIC, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

(a) Describe any impact the proposed project might have on any properties in or eligible for inclusion in the National Register of Historic Places. Provide justification for your response, and include a record of your consultation with the State Historic Preservation Officer (SHPO), if applicable (attach correspondence with SHPO).

A review of the National Register of Historic Places (NRHP) database shows the nearest recorded historic property as Graceland, which is located approximately 3.5 miles southwest of the project site. See the attached National Register of Historic Places Map, Figure 3 in Appendix B. The proposed project would have no impacts to this historic site. A review of the Tennessee Historical Commission (THC) database shows zero records found within the project area or a 1-mile buffer around the project area shown in Figure 4 in Appendix B. In addition to the review of properties recorded in the NRHP and the THC inventory, an historic resources survey, site investigation, and archival research were completed on the 24 properties scheduled for demolition or deconstruction in the scope of work for the project. The investigation and research are detailed in the attached Draft Section 4(f) Evaluation (Appendix D).

Three properties associated with the World War II era Memphis Army Air Field were determined to exceed the 50-year threshold established by the National Historic Preservation Act of 1966 (NHPA) and are potentially eligible for the NRHP. Two of these structures, Hangar No. 6 (Building 2879) and Hangar No. 7 (Building 2837), appear to be eligible under both Criterion A and Criterion C. They are significant under Criterion A based on their association with the domestic war effort and the rapid development of the Army Air Corps and Army Air Forces during World War II, which led to the establishment of the U.S. Air Force in 1947. They are also significant under Criterion C based on the rarity of extant wood hangars from the World War II era and the unique, asymmetrical design and trussed wall construction detail. Although both hangars were modified beginning in 1973, both structures appear to retain enough integrity to be potentially eligible for the NRHP. The remaining property, the Boiler Room (2838), appears to be potentially eligible under Criterion A, based on its association with the domestic war effort, the rapid development of the Army Air Corps and Army Air Forces during World War II, and its role as a support structure to Hangar No. 6 (2879) and Hangar No. 7 (2837). Since only minor modifications have been made to this structure over time, it retains its integrity.

One additional property associated with the Memphis Army Air Field is currently identified as the Paint Shop (2852) and was determined to exceed the 50-year threshold. The original function of this building is unknown, and the building has been heavily modified, further obscuring its original use. As a result, this building does not appear to be eligible for the NRHP.

Following the relocation of FedEx to Memphis in 1973, the company constructed a new Administration Building connecting Hangar No. 6 and Hangar No. 7. This structure retains a high level of integrity in relation to the early years of FedEx operations in Memphis and the development of air cargo transportation. This structure is potentially eligible for listing in the National Register of Historic Places as a district based on Criterion A under Criteria Consideration G. This recommendation is based on the association of these buildings with the exponential growth of FedEx and its impact on local and national economies, as well as international business. The exceptional importance of the property is demonstrated by the fact that there are no other known properties representative of early FedEx operations in the community, state, or nation.

There is also a GSE Hydrogen Test Facility (2884) that was initially considered to be potentially eligible for the NRHP based on Criterion A under Criteria Consideration G, which addresses properties that have achieved significance within the past 50 years. Although this property was constructed in 2014, it was constructed as part of a trial program to test the feasibility of using hydrogen cell-powered ground support vehicles. However, FedEx retired all the hydrogen-fueled GSE vehicles and ended the trial program because the vehicles proved to be unreliable, and the filling station was no longer needed. Given its age, it appears to be unaltered from its original configuration and retain an exceptionally high level of integrity. Due to preliminary consultation with the FAA and the TN-SHPO, this structure was not recommended to be potentially eligible for the NRHP.

The remaining 18 properties did not meet the 50-year threshold or appear to possess extraordinary significance under Criterion Consideration G. As a result, these properties were recommended to be ineligible for the NRHP.

(b) Describe whether there is reason to believe that significant scientific, prehistoric, historic, archeological, or paleontological resources would be lost or destroyed as a result of the proposed project. Include a record of consultation with persons or organizations with relevant expertise, including the SHPO, if applicable.

Based on a field survey and literature review of available historic resources and aerial image collections, the historic resources discussed in the previous section would be adversely affected through demolition. It is likely that Hangar No. 6 (2879) and Hangar No. 7 (2837) are the only remaining examples of this unique, asymmetrical hangar design and trussed wall construction detail. The Boiler Room (2838), which has functioned as an active and ongoing support structure to the hanger facilities since World War II, would be lost or destroyed through the demolition of these structures.

FedEx and the Memphis-Shelby County Airport Authority would consult with the FAA, the Tennessee Historical Commission and other appropriate historical resource agencies and experts to determine appropriate methods for documenting any potentially eligible historical resources that would be demolished or deconstructed during the proposed project. The proposed mitigation would likely include the completion of Historic American Building Survey (HABS) Level II documentation. See the Historic Resources Survey and the Draft Section 4(f) Evaluation (Appendix D) for a more complete discussion of potential adverse effects to historic resources.

(9) BIOTIC COMMUNITIES

Describe the potential of the proposed project to directly or indirectly impact plant communities and/or the displacement of wildlife. This answer should also reference Section 6, Water Quality, if jurisdictional water bodies are present.

The proposed project is entirely within the MEM and would not directly or indirectly impact plant communities or displace wildlife. Aquatic plant and wildlife communities in Hurricane and Nonconnah Creeks would be protected by measures required under the project SWPPP, as described in Section 6.

(10) FEDERAL and STATE-LISTED ENDANGERED AND THREATENED SPECIES

Would the proposed project impact any federally- or state-listed or proposed endangered or threatened species of flora and fauna, or impact critical habitat? Explain, and discuss and attach records of consultation efforts with jurisdictional agencies, if applicable.

Impacts are not expected because no occurrences or habitat for federally or state listed species are known to exist in or near the project area. The TDEC database shows no state listed species in the project area. Stormwater runoff in the project area enters the Nonconnah Creek Drainage, which has seven known listed species within the drainage. With the water

quality protections required under the site SWPPP, however, there would be no effect on water quality in the creek and no impact to listed species.

Though no listed species are known to occur in the project area, FedEx would take standard precautions to protect wildlife during project construction. These include, for instance, consulting with TDEC or the US Fish & Wildlife Service prior to removing any trees greater than 3 inches in diameter to ensure avian and bat species are not adversely affected.

(11) WETLANDS

Does the proposed project involve the modification of delineated wetlands (Delineations must be performed by a person certified in wetlands delineation)? Provide documentation of consultation with agencies having jurisdiction over wetlands and include wetland inventory maps when appropriate.

Satellite imagery and a field check confirmed no presence of wetlands within the project area. Wetlands exist along Nonconnah Creek and Hurricane Creek but not in the vicinity of the project area. With enactment of industry standard BMPs, the project as proposed would have no direct or indirect impact on wetlands.

(12) FLOODPLAINS

(a) Would the proposed project be located in, or would it encroach upon, any 100-year floodplains, as designated by the Federal Emergency Management Agency (FEMA)? Yes_____ No__X__

(b) Would the proposed project be located in a 500-year floodplain, as designated by FEMA? Yes_____ No__X__

(c) If "yes," is the proposed project considered a "critical action", as defined in the Water Resources Council Floodplain Management Guidelines? (see FR Vol. 43, No. 29, 2/10/78) Yes____ No____

(d) You must attach the corresponding FEMA Flood Insurance Rate Map (FIRM) or other documentation showing the project area. Map attached? Yes__X__ No_____ If "no," why not?

The FEMA Flood Insurance Rate Map for the area is attached as Figure 5 in Appendix B.

(e) If the proposed project would cause an encroachment of a base floodplain (the base floodplain is the 100-year floodplain for non-critical actions and the 500-year floodplain for critical actions), what measures would be taken to provide an opportunity for early public review, in accordance with Order 1050.1E, Appendix A, Section 9.2.c?

The project area is not within a 100-year or 500-year floodplain, as designated by FEMA.

(13) COASTAL ZONE MANAGEMENT PROGRAM

(a) Would the proposed project occur in, or affect, a coastal zone, as defined by a state's Coastal Zone Management Plan (CZMP)? Explain.

The project is not located within a CZMP.

(b) If "yes," is the project consistent with the State's CZMP? Explain. If applicable, attach the sponsor's consistency certification and the state's concurrence of that certification. Early coordination is recommended.

Not applicable.

(14) COASTAL BARRIERS

Is the location of the proposed project within the Coastal Barrier Resources System, as delineated by the US Fish and Wildlife Service (FWS) or FEMA coastal barrier maps? Explain.

The project is not located within the Coastal Barrier Resources System.

(15) WILD AND SCENIC RIVERS

Would the proposed project affect any portion of the free-flowing characteristics of a Wild and Scenic River or a Study River, or any adjacent areas that are part of such rivers, listed on the Wild and Scenic Rivers Inventory? Consult the (regional) National Parks Service (NPS), U.S. Forest Service (FS), or other appropriate federal authority for information. Early consultation is recommended.

According to the National Rivers Inventory (NRI) database accessed on the NPS website, no NRI rivers or river segments designated as part of the National Wild and Scenic River System occur within Shelby County.

(16) FARMLAND

(a) Would the proposed project involve the use of federal financial assistance or conversion of federal government land? Explain

The project would not involve use of federal financial assistance or conversion of federal government land.

(b) If "yes" would it convert farmland protected by the Farmland Protection Policy Act (FPPA) (prime or unique farmland) to non-agricultural uses? Yes_____ No__X___

(c) If "yes," determine the extent of project-related farmland impacts by completing (and submitting to the Natural Resources Conservation Service) the "Farmland Conversion Impact Rating Form" (NRCS Form AD 1006). Coordinate with the state or local agricultural authorities. Explain your response, and attach the Form AD 1006, if applicable.

The proposed project would not involve acquisition or conversion of farmland.

(17) ENERGY SUPPLY AND NATURAL RESOURCES

What effect would the proposed project have on energy or other natural resource consumption? Would demand exceed supply? Explain. Letters from local public utilities and suppliers regarding their abilities to provide energy and resources needed for large projects may be necessary.

The proposed project is expected to result in an immaterial change in energy use compared to present conditions due to an expected increase in ground operations efficiency and reduction in developed square footage at the airport. New buildings would also be considerably more energy efficient compared to those that would be removed.

(18) LIGHT EMISSIONS

Would the proposed project have the potential for airport-related lighting impacts on nearby residents? Explain, and, if necessary, provide a map depicting the location of residences in the airport vicinity in relation to the proposed lighting system.

The project would have no effect on off-airport lighting levels.

(19) SOLID WASTE

Would the proposed project generate solid waste? Yes__X___ No_____
If "yes," are local disposal facilities capable of handling the additional volumes of waste resulting from the project? Explain.

The solid waste generated during the proposed project would be disposed of at a landfill capable of receiving the amount and type of waste produced during the demolition process, including waste contaminated with asbestos or other hazardous material. All materials would be evaluated for their potential to be recycled or reused, but an estimated 270,000 cubic yards (conservative preliminary estimate) of non-recyclable waste would be created during demolition. The project construction contractor would determine the classification of all waste streams, including Universal Waste and Hazardous Waste per TDEC SWM Rules 0400-12-01.12 and 0400-12-01.03(b), and secure an agreement with one or more local waste disposal company and the landfill(s) that would receive the waste. The project architectural contractor has identified the following firms as the waste disposal contractors for the project.

- Waste Management Memphis – 750 Hatcher Cir., Memphis • (901) 362-8950
- Republic Services/Allied Services – 3840 Homewood Rd, Memphis • (901) 794-3800
- E-PLEX/E-BOX – 10636 Shelton Road, Collierville, TN 38017 • (901) 850-9996

These companies stated that sufficient space in nearby landfills was available to receive the waste, though the exact landfills were not yet identified. This information would be provided to the FAA when it is available.

(20) CONSTRUCTION IMPACTS

Would construction of the proposed project: 1) increase ambient noise levels due to equipment operation; 2) degrade local air quality due to dust, equipment exhausts and

burning debris; 3) deteriorate water quality when erosion and pollutant runoff occur; 4) or disrupt off-site and local traffic patterns? Explain.

1)_ Impacts of the proposed project would all be demolition, deconstruction or construction related, and therefore the discussion of impacts under all technical areas in this document are focused on impacts that would occur during demolition, deconstruction, and construction. Demolition, deconstruction and construction of the project could result in minor short-term impacts to noise due to the use of heavy equipment operation, but would be kept to a minimum by employing appropriate BMPs. No noise-sensitive areas are in the project's immediate vicinity and the project is not anticipated to affect the airport's noise contours.

2) Potential demolition, deconstruction and construction-related impacts are discussed in the previous Air Quality Section. The demolition, deconstruction and construction activities associated with the project could result in minor short-term impacts to air quality due to the use of heavy equipment operation, but would be kept to a minimum by employing appropriate BMPs, including use of water spray or other dust control methods to control fugitive dust emissions. New ground disturbance and burning of debris are not anticipated. If disposal of brush or trees/tree limbs is needed, wood waste would be disposed of by chipping, grinding, or composting rather than open burning.

3)_ With the implementation of industry standard BMPs, such as controlling runoff through implementation of a SWPPP, project-related demolition, deconstruction, and construction would create negligible impacts. Contractors would implement BMPs such as Installing sediment controls such as filter berms and silt fences around storm drains to capture and retain mobilized debris and sediment. Such devices would be periodically inspected and retained material would be removed to maintain proper operation of the controls.

4)__ Project-related construction traffic would be minor compared to present traffic and would not cause a degradation of service.

(21) OTHER CONSIDERATIONS

(a) Is the proposed project likely to be highly controversial on environmental grounds? Explain.

The proposed project would be contained entirely within highly disturbed grounds and would result in improved working conditions. In October 2016, the Memphis-Shelby County Airport Authority contacted the appropriate governing agencies and shared information concerning the proposed project and all but one agency concurred with the conclusions of this EA. The Tennessee Historical Commission requested additional information regarding potential impacts to historical resources, which has been provided and is included in this document as Appendix D. FAA would continue to work with the Historical Commission to reach agreement on the impact assessment, and on appropriate mitigation for such impacts. Letters from the concurring agencies are attached in Appendix A. Project construction and operation would result in negligible impacts; therefore, it is unlikely to be considered highly controversial on environmental grounds.

(b) Is the proposed project likely to be inconsistent with any federal, state or local law or administrative determination relating to the environment? Explain.

The proposed project is not likely to be inconsistent with a federal, state, or local law or administrative determination related to the environment.

(c) Is the proposed project reasonably consistent with plans, goals, policies, or controls that have been adopted for the area in which the airport is located? Explain

The proposed project would not change the use or character of the project site or surrounding area and would be consistent with existing land use plans, goals, policies, and zoning.

(22) HAZARDOUS SITES/MATERIALS

Would the proposed project require the use of land that may contain hazardous substances or may be contaminated? Explain your response and describe how such land was evaluated for hazardous substance contamination. Early consultation with appropriate expertise agencies (e.g., US Environmental Protection Agency (EPA), EPA-certified state and local governments) is recommended.

The project would generate a large volume of waste, some of which would be considered hazardous waste, especially asbestos (Chrysotile) containing materials (ACMs), which could contaminate the project site and surrounding properties if not handled properly. Other potential contaminants include: lead-based paint; CFC's from refrigerant in HVAC systems; and mercury and PCBs from light fixtures (see Section 4.4 of Appendix E for a more complete list of hazardous waste streams that are likely to be encountered during demolition). As shown in the project hazardous materials study (Appendix E), FedEx conducted a hazardous materials investigation that involved analyzing 210 bulk samples from 19 of the structures, showing that at least 10 buildings contain asbestos. Several other buildings are presumed to contain asbestos. As buildings are dismantled and demolished, further samples would be taken as materials are uncovered to assess presence and level of hazardous materials. Contractors would assume that asbestos contamination is present unless tests confirm a non-detectable level.

Location and quantity of ACMs would be verified in the field by the demolition contractor. Removal and disposal of asbestos containing materials would be done in conformance with applicable safety and environmental regulations, as well as BMPs. Non-friable ACMs elected for removal would be removed as a Class II abatement operation pursuant to 29 CFR 1926.1101; friable ACMs would be removed prior to demolition. Shelby County Health Department – Air Pollution Control (SCHD-APC), the local authority for enforcement of the National Emission Standards for Hazardous Air Pollutants (NESHAP), also regulates the removal of Category II nonfriable asbestos materials (Transite) prior to demolition. Category I non-friable materials may be demolished with structures. These materials include roofing, confirmed or presumed, and vinyl tiles with mastic. Tiles and mastic, if demolished with structure, would necessitate landfill disposal of demolition substrate. A cost-benefit analysis would weigh the advantages of abatement of Category I materials or demolition in place of materials.

FedEx and/or its construction contractor would also be responsible for filing required notices for all hazardous waste disposal, including filing a notice of asbestos demolition with SCHD-APC. A notification is required for the removal, renovation and/or demolition of asbestos where quantities exceed 260 linear feet or more of pipes, 160 square feet or more on other facility components, or 35 cubic feet or more off facility components where the length or area could not be measured previously. Notification to SCHD-APC is required of any demolition even if there is no asbestos. Exemptions include nonfriable asbestos containing materials, packings, gaskets, resilient floor covering and asphalt roofing products that when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure. A completed Notification of Asbestos Demolition or Renovation Application must be submitted at least 10 working days before the asbestos stripping or removal work begins.

Most concrete pads beneath the 23 demolished structures would be removed. Removed concrete would be evaluated for construction waste recycling. The area needed for construction of the new facilities would require pouring new pads for the structure. The construction contractor would test the soil underneath each facility for potential contamination and take appropriate clean up action if needed.

Three active underground storage tanks are located in the project area (Facility ID 9-792140, 9-792231, and 9-792707). Before any UST is moved or disturbed the TDEC Memphis Field Office would be notified. If one of the active tanks is damaged during demolition or construction, notification would be provided to the Memphis Field Office Underground Storage Tank Division within 72 hours and appropriate remedial actions taken immediately. The contact for the UST Division is Jeff Phillips at (901) 371-3032

(23) PERMITS

List all required permits for the proposed project. Indicate whether any difficulties are anticipated in obtaining the required permits.

Shelby County air regulations require a construction permit for emission units that have the potential to emit more than 5 tons of NOx per day. The project may require a construction permit if the final design includes equipment that would trigger this requirement. When installation is complete and equipment becomes operational, the emission unit and any applicable requirements would be incorporated into the existing Title V Air Permit No. 00664-01TV. FedEx holds NPDES Permit TN0067351, which covers the discharge of stormwater from various outfalls located throughout the FedEx facility. All of the planned demolition and construction work is located within currently recognized and regulated drainage basins. The Tennessee Department of Environment and Conservation would be notified of construction activity within these drainage basins.

NOTE: Even though the airport sponsor has/shall obtain one or more permits from the appropriate federal, state, and/or local agencies for the proposed project, initiation of such project shall NOT be approved until FAA has issued its environmental determination.

(24) ENVIRONMENTAL JUSTICE

Would the proposed project impact minority and/or low-income populations? Consider human health, social, economic, and environmental issues in your evaluation. Explain.

The project as proposed would have no impact on any residence. The closest residence is 0.75 mile from the project site. All nearby residences are closer to active highways or runways than to the project area; therefore, no residence would be affected by demolition or construction activities. The project would generate a substantial number of jobs for the demolition, deconstruction, and new construction activities, and would not reduce permanent employment at the airport. The project is not expected to create human health, social, economic, or health issues; therefore, it would not result in environmental justice impacts.

(25) CUMULATIVE IMPACTS

When considered together with other past, present, and reasonably foreseeable future development projects on or off the airport, federal or non-federal, would the proposed project produce a cumulative effect on any of the environmental impact categories above? You should consider projects that are connected, cumulative and similar (common timing and geography). Provide a list of such projects considered. For purposes of this Evaluation Form, generally use 3 years for past projects and 5 years for future foreseeable projects.

In general, operations at MEM have decreased considerably in recent years. The total number of passengers moving though the airport per year has declined steadily since 2010, from more than 10 million passengers that year to just under 3.8 million passengers in 2015. Therefore, when comparing present with past operations, cumulative impacts from airport operations have reduced considerably. The reduction in passenger traffic at the airport has had a secondary effect on surrounding businesses as well, and in general economic activity in the area was negatively affected by the reduction in passenger traffic.

MEM remains the busiest cargo airport in the country; FedEx may further upgrade its facilities at MEM as budget is available and economics justify. Potential actions may include removal of certain aging equipment and buildings and providing flexibility for possible future improvements. Plans for FedEx's Golden Triangle Ramp project were recently confirmed by FedEx management, though the exact timing for construction is still uncertain. The Golden Triangle Ramp project would add seven new gates at the west end of FedEx's facilities, as well as a new maintenance building and an emergency generator.

MSCAA is planning other improvements at MEM as well, following its long-term, multi-year modernization plan. The multiphase plan includes moving walkways, wider corridors, larger boarding areas, higher ceilings and natural lighting. The plan would consolidate airline, retail and food and beverage operations in Concourse B. The project includes the removal of the south ends of the A and C Concourses to allow for unobstructed access by aircraft to the entire B Concourse. The end of the A Concourse has been removed and the repaving of the construction area has been completed. The timing of the removal of the end of Concourse C would depend on the final design plans for the B Concourse. The airport is currently reviewing design options. The entire project would take an estimated 5-7 years to complete

MSCAA is also planning the construction of a consolidated rental car facility on a 48-acre vacant lot across Airport Boulevard from the main passenger terminal. The facility would include construction of six buildings for rental car vehicle service, maintenance, car washing, fueling, and administration. The lot is a former residential development that was purchased and cleared by MSCAA during a past expansion of the airport. Other planned projects that have been reviewed or are under review for environmental impacts include a consolidated glycol collection pad, located between the parallel runways just north of Shelby Drive, and replacement airfield maintenance, warehouse, operations and police facility, also located between the parallel runways on Louis Carruthers Road, north of Shelby Drive.

Separate NEPA compliance documents have been submitted for the Golden Triangle Ramp project. Separate NEPA compliance documents would be prepared the rental car facility, and other future improvement projects subsequently approved by FedEx or MSCAA management over the next 2 to 10 years. Each would include an analysis of its potential contribution to cumulative impacts in combination with the Relocation project and other past, present and reasonably foreseeable projects.

There are no other known or anticipated large federal or nonfederal projects located within the area that would produce a cumulative effect on the environment in the project area. Similarly, there are no known cumulative impacts in the region to which the project would contribute.

The Relocations project would be contained entirely within FedEx's portion of the airport, and would not create new infrastructure that would have a growth-inducing effect. There is no sensitive or critical habitat in the immediate area, and no land use conflicts would occur because the area is zoned for airport use. The proposed action would have no adverse impacts on habitat or land use, and therefore its contribution to any ongoing or future cumulative impacts in those technical areas is negligible.

Therefore, when considered together with other past, present, and reasonably foreseeable future development projects on or off the airport, federal or non-federal, the proposed action is unlikely to produce a cumulative effect on public health or the environment.

10. MITIGATION

(a) Describe those mitigation measures to be taken to avoid creation of significant impacts to a particular resource as a result of the proposed project, and include a discussion of any impacts that cannot be mitigated, or that cannot be mitigated below the threshold of significance (See 5050.4B & 1050.1E, Appendix A).

With the incorporation of standard BMPs and the documentation of historic resources described in Section 8, no impacts would occur as a result of approval of the project, and therefore no additional mitigation is needed.

(b) Provide a description of the resources that are in or adjacent to the project area that must be avoided during construction. **Note:** The mitigation measures should be incorporated into the project's design documents.

The work is planned within FedEx's complex in the northern portion of the airport, which has been used for FedEx operations since 1973. As is typical for large urban airports, the project area is characterized by commercial or industrial land uses consisting of commercial warehouse buildings, airplane hangars, smaller buildings, and roads, taxiways, and runways. There are no natural or unique features within the airport property. Small areas of landscaping are adjacent to or near some of the buildings targeted for demolition and Hurricane Creek runs as close as 100 feet from buildings that are targeted for demolition. Hurricane Creek runs under the airport in a tunnel before coming to light in a concrete-lined channel near the Southwide buildings. It then enters a more natural channel as it leaves the airport property and joins Nonconnah Creek about 2,000 feet north of the project area. Other than the Nonconnah Creek corridor, the area outside the airport is dominated by parking lots and large commercial and industrial facilities. No work is planned within or near any natural feature. Hurricane Creek and Nonconnah Creek would be avoided and protected through the measures required by the project SWPPP, such as installing wattles to prevent sediment from washing into Hurricane Creek; therefore, no additional mitigation is required.

11. PUBLIC INVOLVEMENT

Describe what efforts would be made to involve the public with this proposed project. Discuss the appropriateness of holding public meetings and/or public hearings, making the draft document available for public comment, or the preparation of a public involvement plan, etc.

FAA public involvement guidelines require the project sponsor, the Memphis-Shelby County Airport Authority, to advertise a Notice of Availability of the Draft Environmental Assessment and a Notice of Opportunity for a Public Hearing. This notice was published on {Insert Date[2]}in the local newspaper of record, *The Commercial Appeal*, giving interested parties 30 days to comment on the EA and/or to request a public hearing. Depending on the comments received, FAA may revise the Draft EA and issue a Final EA, and hold a public hearing on the project.

[2] Note to Reviewer: the date of the public notice for release of the EA will be updated after FAA approves the release of the EA to the general public.

12. PREPARER CERTIFICATION

I certify that the information I have provided above is, to the best of my knowledge, correct.

_____ _____

Signature Date

_____

Name, Title

_____

Affiliation

13. AIPORT SPONSOR CERTIFICATION

I certify that the information I have provided above is, to the best of my knowledge, correct. I also recognize and agree that no construction activity, including but not limited to site preparation, demolition, or land disturbance, shall proceed for the above proposed project(s) until FAA issues a final environmental decision for the proposed project(s), and until compliance with all other applicable FAA approval actions (e.g., ALP approval, airspace approval, grant approval) has occurred.

_____ _____

Signature Date

_____

Name, Title

_____

Affiliation

Note: This page to be completed by FAA only

14. FAA DECISION:
Having reviewed the above information, certified by the responsible airport official, it is the FAA decision that the proposed project(s) of development warrants environmental processing as indicated below.

☐ The proposed development action has been found to qualify for a Short Environmental Assessment.

☐ The proposed development action exhibits conditions that require the preparation of a detailed Environmental Assessment (EA).

☐ The following additional documentation is necessary for FAA to perform a complete environmental evaluation of the proposed project:

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

*Action Reviewed/Recommended by:

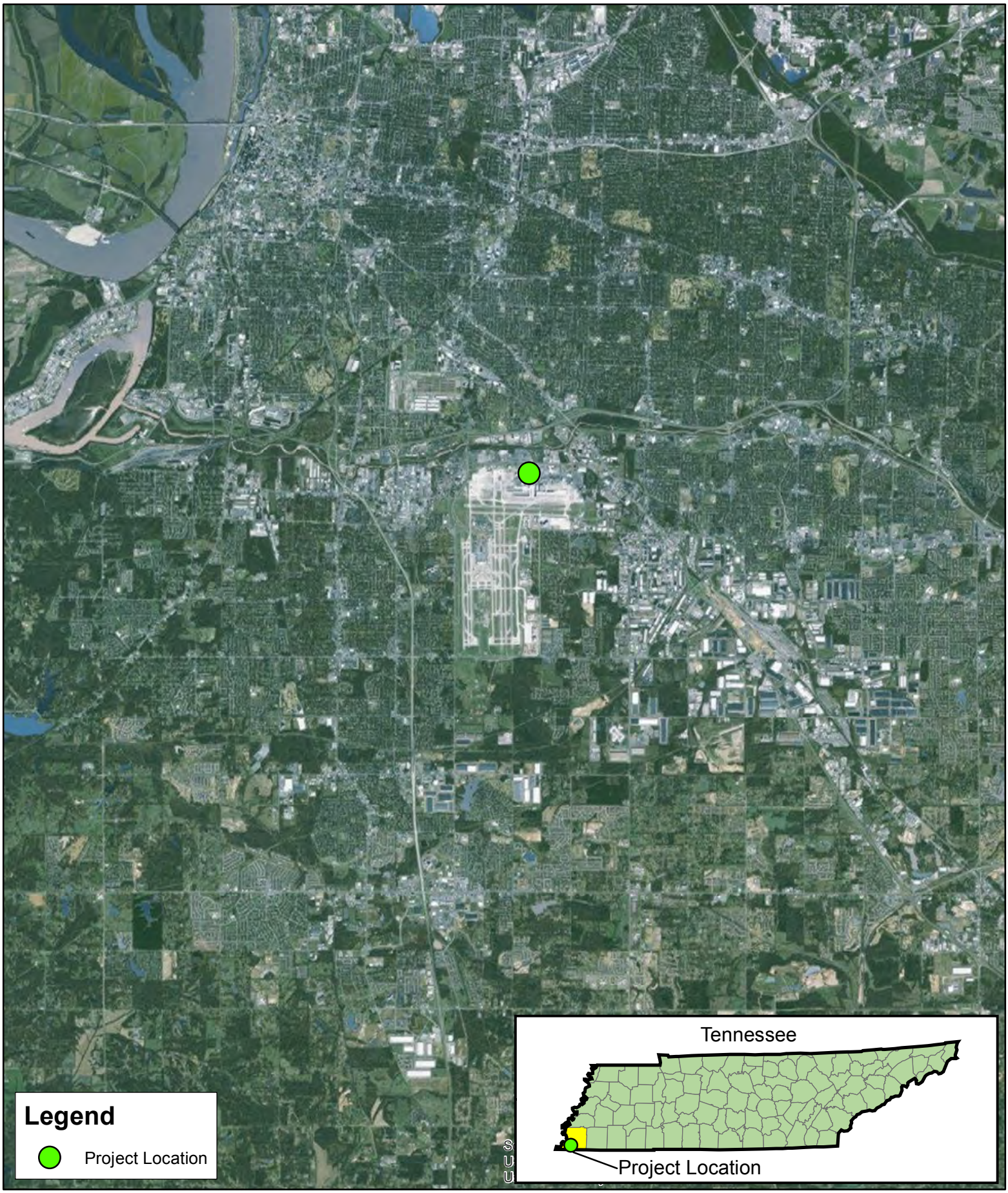
_____ _____
(FAA Environmental Specialist) Date

*Approved: _____ _____
(FAA Approving Official) Date

* The above FAA approval only signifies that the proposed development action(s), as described by the information provided in this Evaluation Form, initially appears to qualify for the indicated environmental processing action. This may be subject to change after more detailed information is made known to the FAA by further analysis, or though additional federal, state, local or public input, etc.

Appendix A: Agency Concurrence Letters

Appendix B: Figures



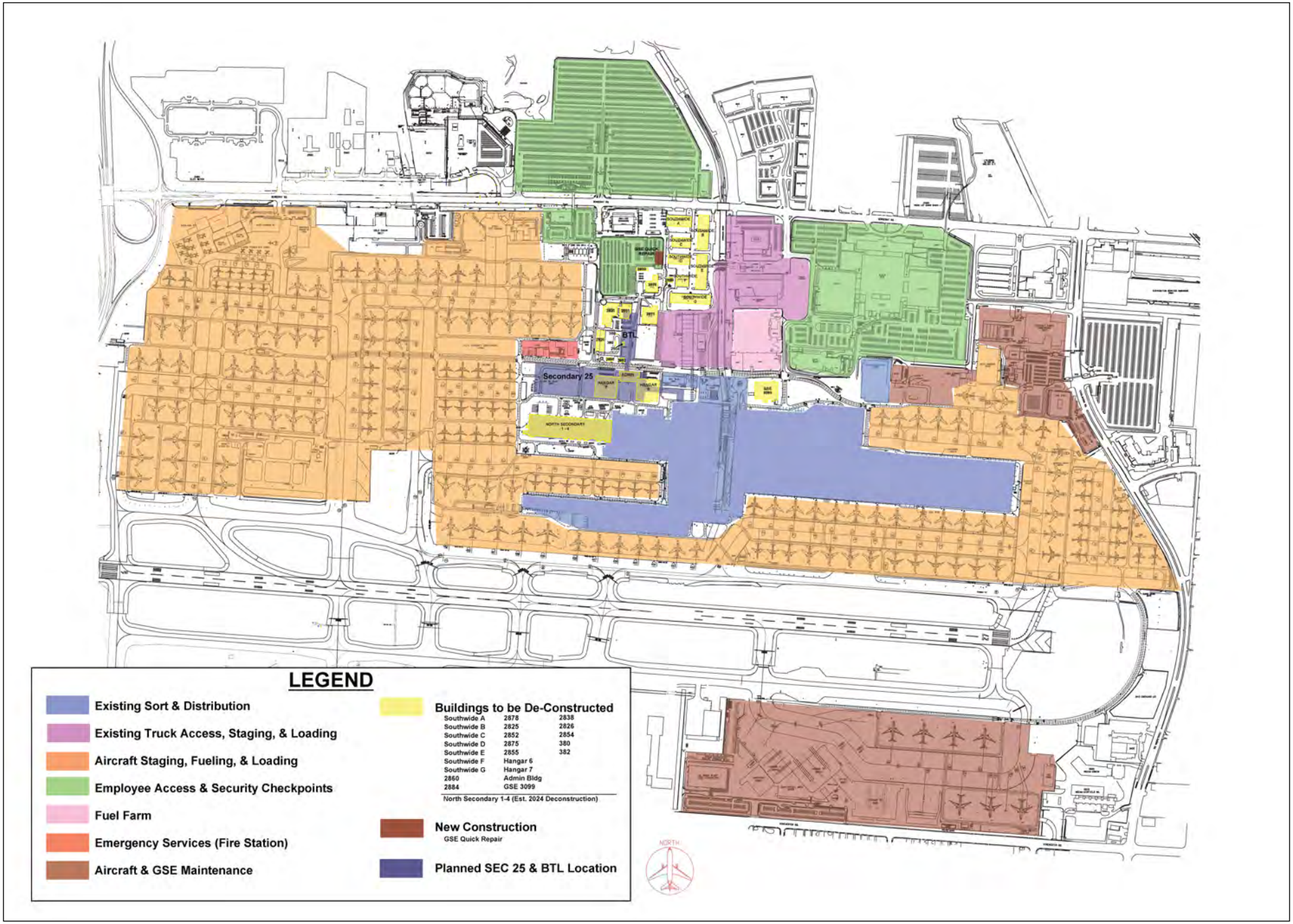
Miles
0 2 4 8

Kilometers
0 2 4 8

N

MEMH Transformation Project
Memphis, Shelby Co., TN
Figure 1: Site Vicinity Map

NewFields



Miles
0 0.25 0.5 1

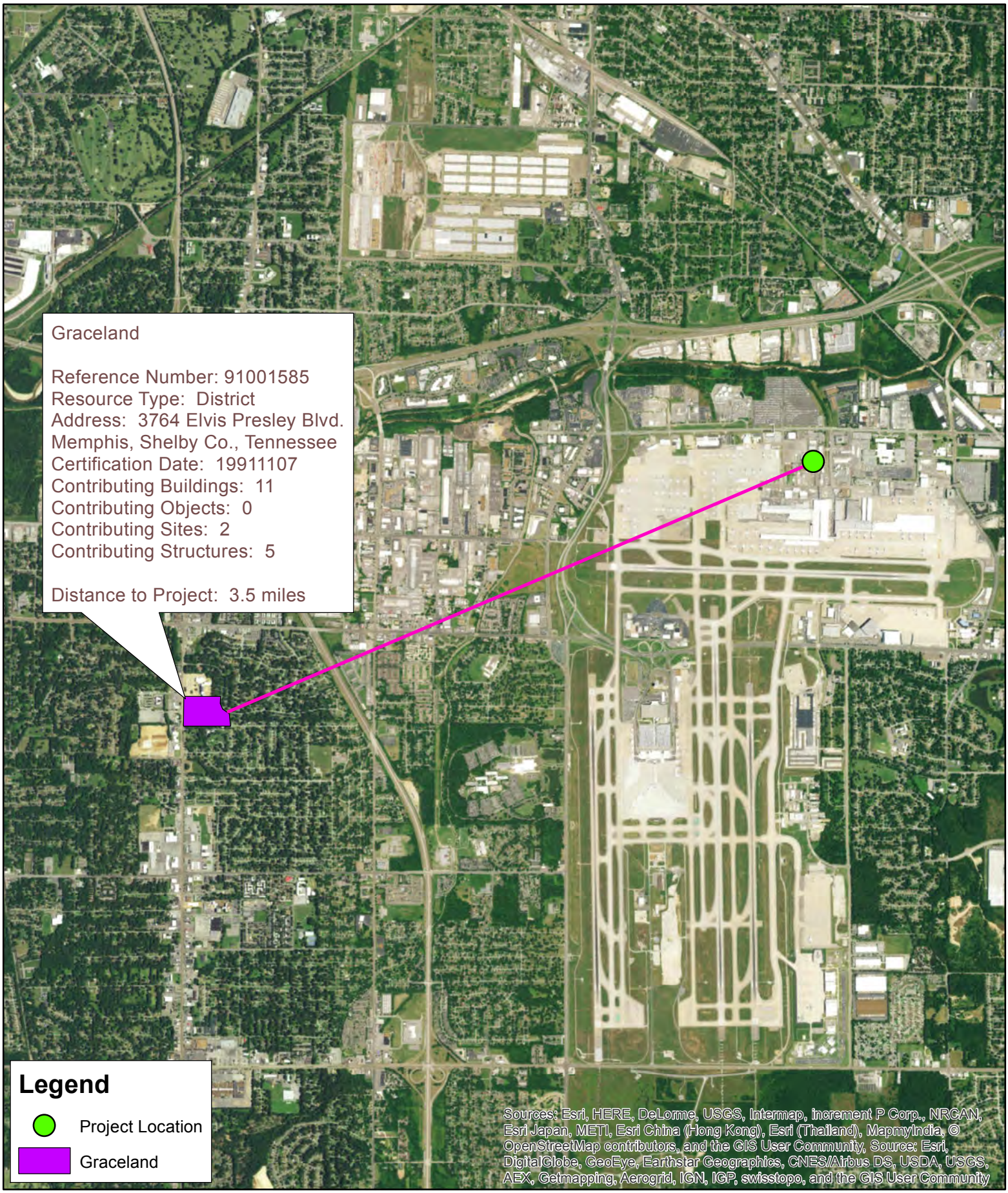
Kilometers
0 0.25 0.5 1

N

MEMH Transformation Project

Figure 2: Project

NewFields



Miles
0 0.5 1 2

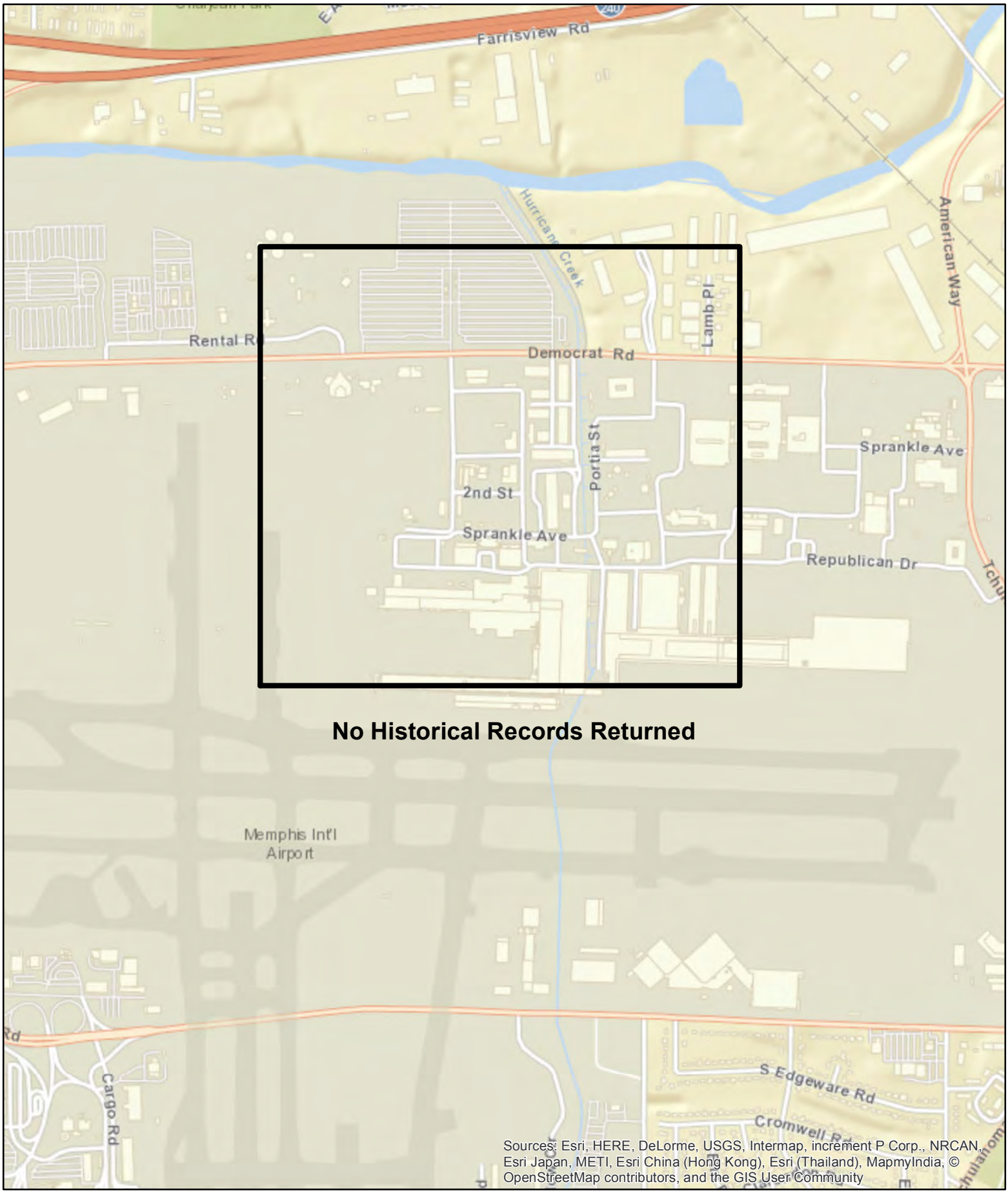
Kilometers
0 0.5 1 2

N

MEMH Transformation Project

Figure 3: NRHP Graceland

NewFields



Miles
0 0.2 0.4 0.8

Kilometers
0 0.2 0.4 0.8

N

MEMH Transformation Project

Figure 4: THC No Records Found

NewFields

Miles
0 0.5 1 2

Kilometers
0 0.5 1 2

N

MEMH Transformation Project

Figure 5: FEMA Map

NewFields

Appendix C: Air Emissions Inventory Report

Appendix C
FedEx Express MEM Operations Efficiency Improvement Project
Air Emissions Inventory Report

Introduction

FedEx Express (FedEx) has proposed to increase the efficiency of operations at the Memphis International Airport (MEM) in Memphis, TN by eliminating older, inefficient structures; establishing new staging areas; modifying existing building interiors; and, constructing new buildings. This *Air Emissions Inventory Report (Inventory)* was performed as part of National Environmental Policy Act (NEPA) documentation for the FedEx Memphis Hub Transformation project. Emissions were estimated from all activities (Table 1), associated with the Transformation project that would generate emissions during demolition, deconstruction and construction activities. The proposed action would not increase airside or landside capacity, and would result in a reduction of developed square footage at MEM; as such, emissions from operations would not increase.

This Inventory is provided as an appendix to the *Environmental Evaluation (Short Form Environmental Assessment)* for this project. The Inventory is intended to satisfy the air quality requirements established by NEPA. The analysis herein was performed to evaluate the environmental consequences of the project with respect to air quality.

Regulatory Applicability

The *NEPA Implementing Instructions for Airport Actions (Order 5050.4B)* developed by U.S. Department of Transportation's Federal Aviation Administration (FAA) provides Significant Impact Thresholds for resource categories in Table 7-1 (FAA 2006). Shelby County, TN, is in attainment with all National Ambient Air Quality Standards (NAAQS), though it is in maintenance status for ozone and carbon monoxide (CO). The emissions inventory was performed to determine whether or not the project would cause or contribute to a violation of the NAAQS for criteria air pollutants.

The General Conformity Rule for Federal Actions (40 Code of Federal Regulations [CFR] 93.153) presumes that a project conforms with the State Implementation Plan (SIP) if it is an exempted activity or projected emissions are considered de minimis. This project does not meet the definition of actions that are exempt under the General Conformity Rule (40 CFR 93.153[c][2]). Consequently, it was necessary to calculate emissions of ozone precursors and carbon monoxide to determine whether or not the emissions were below the thresholds established by the General Conformity Rule (40 CFR 93.153[b]). These threshold rates are specific to attainment status (i.e. non-attainment and maintenance areas). Emissions below these threshold values are considered de minimis and General Conformity applies. In addition to the maintenance area criteria pollutants (ozone and carbon monoxide), particulate emissions and sulfur dioxide were also calculated as part of the emissions inventory.

Air Emissions Inventory Assumptions and Inputs

An air quality analysis was performed using the Airport Construction Inventory Tool (ACEIT), version 1.0. A Level 1 assessment, which provides a conservative estimate, was performed to determine if detailed program inputs were required to refine the data. Emissions sources during the demolition/deconstruction/construction phase include worker commutes, on-site motorized vehicle use, use of trucks for delivery of supplies and removal of debris, and fugitive dust generated by demolition and construction activities. Deconstruction is assumed to have the same or fewer emissions as demolition, and therefore all deconstruction is modeled as demolition, which is a conservative assumption that tends to overstate actual emissions. Therefore, for the purpose of this analysis, deconstruction activities are analyzed as demolition activities.

Fuel characteristics and associated emission factors are influenced by region, season and ambient temperature. ACEIT uses the project location, the season that the proposed action will be performed, and the ambient temperatures to determine applicable emission factors. The ACEIT database contains regional data by county, including Shelby County, TN. Emissions were calculated on an annual basis to represent air quality throughout the demolition and construction period. The regulatory de minimis thresholds are in terms of annual emissions (tons per year). The year 2022 was selected as it is scheduled to be the last complete year (January through December) of the demolition and construction phases of the proposed action. Timeline tasks that are scheduled for less than one year were projected on an annual basis to represent conservative estimates of emissions. Average monthly temperatures were obtained from the National Oceanic and Atmospheric Administration (NOAA) website (NOAA 2017).

Emissions from the demolition and construction activities were calculated based on building dimensions and the cost of the project. A Level 1 assessment uses default values for fuel type and equipment, based on construction activity categories. The following ACEIT Project Types were selected to correspond with each activity: Demolition – Building; Demolition – Concrete; and Building. The “Building” Project Type is further defined by the size of the structure to be constructed. Selections were made based on the most representative size of the four available categories.

Equipment types for demolition activities included excavators, pickup trucks, skid-steer loaders, generator sets, and dump trucks, all fueled by diesel. Equipment types for construction activities included the aforementioned equipment, as well as backhoes, fork trucks, material delivery vehicles, lifts, cranes, and equipment associated with concrete construction. ACEIT also includes vehicle emissions from gasoline engines for construction employees commuting to the job site and assumes 30 miles round trip.

Ceiling and roof thickness were assumed to be 2 feet in order to calculate open space height. Project costs for demolition activities were apportioned based on annual square footage to be

demolished, or applicable timeframes. Project costs for construction activities were apportioned based on applicable timeframes of construction for each building.

ACEIT calculates emissions for non-road, on-road and fugitive emissions. Construction equipment typically falls under the category of non-road sources, while on-road sources include employees commuting to and from work and material transport trucks operating on highways and roadways. Fugitive emissions are those that do not pass through a stack, vehicle exhaust pipe, or similar opening and are separated into two broad categories in the ACEIT program: dust (particulate matter) and evaporative/volatilization emissions. The source of emissions is primarily vehicle exhaust (non-road and on-road) for this project; fugitive emissions consisted primarily of particulate matter.

The Level 1 assessment resulted in emissions less than the de minimis thresholds for all NAAQS criteria emissions except carbon monoxide. Investigation of the default parameters for the Level 1 assessment indicated that vehicle miles travelled (VMT) associated with the commuting of construction employees was significantly higher than is anticipated for the proposed action. The construction of the Secondary 25 and Bulk Truck Load (BTL) buildings were the largest contributors. The Level 1 model projected that greater than 1,700 employees per day would commute a default round trip distance of 40 miles daily during the demolition and construction phases of the proposed action, but the maximum number of employees for the project would be 1,000 employees per day.

Therefore, a limited Level 2 analysis was conducted for CO emissions, using timeline and projected daily construction worker data supplied by FedEx; this adjusted the VMT parameters for the Secondary 25 and BTL buildings to reflect a more realistic representation of commuter miles. It is important to note that the ACEIT raw data output for the Level 2 CO assessment still shows more than 1,000 employees due to internal algorithms; however, the emission factors are based on VMT and not on the number of employees.

Emissions Inventory Results

Emissions were calculated for ozone precursors (nitrogen oxides [NOx] and volatile organic compounds [VOC]) and CO to determine if the emissions were de minimis. Particulate and sulfur dioxide (SO_2) emissions were also calculated. The ACEIT output data are available electronically for review and show detailed emissions calculations and inputs specific to each activity, as well as emission factors and activity rates. Estimates were produced for emissions from engine-powered construction equipment, worker commutes, material transport, fugitive dust (particulate matter less than 10 microns [PM_{10}] and less than 2.5 microns [$PM_{2.5}$]) during demolition and construction, and evaporative/volatilization sources. ACEIT default emission factors originate from several sources including EPA's NONROAD® model; EPA's MOVES® model; AP-42, 5th Edition (EPA 1995); and, engineering experience. The calculated emissions are presented in Table 1.

The ACEIT program performs one run per building in the same "Project Type" (i.e. demolition of buildings, demolition of concrete, building construction, taxiways, etc.). In some cases, the model was set up to run demolition of buildings and slabs together; however, the majority of the projects were set up to run a single project type. Project types are listed in Table 1.

Table 1. Total Project Emissions

		Criteria Air Pollutants					
		VOC	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2
Project Type	**Project**	**Short Tons**					
Demolition - Building	Hangar #6 (2879)	0.0373	0.2803	0.4755	0.0199	0.0185	0.0011
Demolition - Building	Hangar #7 (2837)	0.0299	0.1896	0.4365	0.0136	0.0127	0.0009
Demolition - Building	Admin (2861)	0.0158	0.1935	0.2307	0.0114	0.0108	0.0007
Demolition - Building	GSE (3099)	0.0329	0.2457	0.4197	0.0174	0.0162	0.0010
Demolition - Building	Southwide 'A'	0.0199	0.1488	0.2552	0.0106	0.0098	0.0006
Demolition - Building	Southwide 'B'	0.0281	0.2092	0.3561	0.0148	0.0138	0.0008
Demolition - Building	Southwide 'C'	0.0135	0.0993	0.1724	0.0070	0.0065	0.0004
Demolition - Building	Southwide 'D'	0.0158	0.1173	0.2006	0.0083	0.0077	0.0005
Demolition - Building	Southwide 'E'	0.0279	0.2075	0.3554	0.0147	0.0137	0.0008
Demolition - Building	Southwide 'F'	0.0102	0.0752	0.1278	0.0053	0.0049	0.0003
Demolition - Building	Southwide 'G'	0.0292	0.2165	0.3730	0.0153	0.0143	0.0009
Demolition - Building	2825	0.0199	0.1485	0.2551	0.0106	0.0098	0.0006
Demolition - Building	2838	0.0024	0.0142	0.0265	0.0009	0.0009	0.0001
Demolition - Building	2852	0.0023	0.0137	0.0262	0.0009	0.0008	0.0000
Demolition - Building	2855	0.0114	0.0830	0.1449	0.0058	0.0054	0.0003
Demolition - Building	2860	0.0037	0.0233	0.0441	0.0016	0.0015	0.0001
Demolition - Building	2875	0.0188	0.1414	0.2383	0.0100	0.0094	0.0006
Demolition - Building	2878	0.0136	0.1008	0.1730	0.0071	0.0066	0.0004
Demolition - Building	2884	0.0028	0.0161	0.0342	0.0010	0.0010	0.0001
Construction - Building	Tug Repair Shop	0.1053	0.6021	0.6002	0.0633	0.0449	0.0022
Demolition - Slab	Hangar #6	0.0147	0.0627	0.2061	0.0413	0.0030	0.0003
Demolition - Slab	Hangar #7	0.0141	0.0585	0.2047	0.0401	0.0028	0.0003
Demolition - Slab	Admin	0.0093	0.0287	0.1943	0.0311	0.0014	0.0002
Demolition - Slab	GSE 3099	0.0127	0.0503	0.2018	0.0376	0.0024	0.0003
Demolition - Slab	Building 2825	0.0120	0.0456	0.2002	0.0362	0.0022	0.0003
Demolition - Slab	Building 2838	0.0059	0.0078	0.1871	0.0248	0.0005	0.0001
Demolition - Slab	Building 2852	0.0059	0.0078	0.1871	0.0248	0.0005	0.0001
Demolition - Slab	Building 2855	0.0085	0.0242	0.1928	0.0297	0.0012	0.0002
Demolition - Slab	Building 2875	0.0087	0.0255	0.1932	0.0301	0.0013	0.0002
Demolition - Slab	Building 2878	0.0095	0.0303	0.1949	0.0316	0.0015	0.0002
Demolition - Slab	Building 2860	0.0062	0.0097	0.1878	0.0253	0.0005	0.0001
Demolition - Slab	Building 2884	0.0060	0.0084	0.1873	0.0249	0.0005	0.0001
Demolition - Slab	Southwide A	0.0102	0.0347	0.1964	0.0329	0.0017	0.0002
Demolition - Slab	Southwide B	0.0121	0.0463	0.2004	0.0364	0.0022	0.0003

		Criteria Air Pollutants					
		VOC	NOx	CO	PM_{10}	$PM_{2.5}$	SO_2
Project Type	**Project**	**Short Tons**					
Demolition - Slab	Southwide C	0.0087	0.0251	0.1931	0.0300	0.0013	0.0002
Demolition - Slab	Southwide D	0.0092	0.0285	0.1942	0.0310	0.0014	0.0002
Demolition - Slab	Southwide E	0.0121	0.0463	0.2004	0.0364	0.0022	0.0003
Demolition - Slab	Southwide F	0.0078	0.0200	0.1913	0.0284	0.0010	0.0002
Demolition - Slab	Southwide G	0.0123	0.0479	0.2010	0.0369	0.0023	0.0003
Demolition - Slab and Building	Building 380	0.0082	0.0176	0.1985	0.0248	0.0009	0.0002
Demolition - Slab and Building	Building 382	0.0066	0.0080	0.1941	0.0241	0.0004	0.0001
Demolition - Slab and Building	Building 2826	0.0308	0.1526	0.2600	0.0348	0.0081	0.0006
Demolition - Slab and Building	Building 2854	0.0083	0.0178	0.1986	0.0249	0.0009	0.0002
Construction - Building	Secondary 25	2.9494	5.8078	51.9489	0.6177	0.3081	0.0550
Construction - Building	Bulk Truck Load	2.2284	2.2312	35.9706	0.2246	0.1196	0.0130
Demolition - Building	Secondary 1-4	0.4710	1.7599	1.6223	0.0954	0.0879	0.0085
	Total (short tons)	6.33	13.73	99.05	1.90	0.77	0.094
	Total (tons)	**5.74**	**12.45**	**89.86**	**1.72**	**0.69**	**0.085**

CO – carbon monoxide
NOx – nitrogen oxides
PM_{10} – particulate matter less than 10 microns in diameter
$PM_{2.5}$ – particulate matter less than 2.5 microns in diameter
So_2 – sulfur dioxide
TPY – tons per year
VOC – volatile organic compounds

The calculated emissions for ozone precursors (NOx and VOCs), CO, PM_{10}, $PM_{2.5}$, and SO_2 were below the applicable General Conformity de minimis thresholds established by the Clean Air Act (40 CFR 93.853(b)), as shown in Table 2 below. site. The analysis conducted was purposely driven to capture the greatest potential for impact, resulting in a conservative estimate of emissions.

Table 2. De Minimis Thresholds and Emission Inventory Results

	VOC (TPY)	NOx (TPY)	CO (TPY)	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	SO_2 (TPY)
De Minimis Threshold[1]	100	100	100	100[2]	100[2]	100[2]
Project Emissions	5.74	12.45	89.86	1.72	0.69	0.085

CO – carbon monoxide
NOx – nitrogen oxides
PM_{10} – particulate matter less than 10 microns in diameter
$PM_{2.5}$ – particulate matter less than 2.5 microns in diameter
TPY – tons per year
VOC – volatile organic compounds
[1] 40 CFR 93.853(b)(2) – Standards for maintenance areas
[2]Thresholds for particulate are shown for demonstration purposes. Shelby County is in attainment for PM_{10} and $PM_{2.5}$.

Conclusions

The regulatory review conducted for Federal Express' MEM Transformation/Relocation Project determined that the project is not an exempted action under the General Conformity Rule (40 CFR 93.153[c][2]). Consequently, an air quality analysis was performed to determine if emissions of ozone precursors and carbon monoxide were below the General Conformity Rule's threshold values for these pollutants (40 CFR 93.153[b]) and, thus presumed to conform. The air quality analysis, performed using the FAA's ACEIT program, determined that the projected emissions were below threshold values. The project is presumed to conform with the SIP and, therefore, will not cause or contribute to a violation of the 8-hour ozone or CO NAAQS.

References

U.S. Environmental Protection (EPA). "Compilation of Air Pollutant Emission Factors (AP-42), 5th Edition." 1995.

Federal Aviation Administration (FAA). "National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions (Order 5050.4B)." 2006.

National Oceanic and Atmospheric Administration (NOAA). *National Centers for Environmental Information.* 2017. http://www.ncdc.noaa.gov (accessed September 11, 2017).

Appendix D: Historic Resources Report and 4(f) Evaluation

HISTORIC AND ARCHITECTURAL ASSESSMENT PURSUANT TO 36 CFR PART 800 AND SECTION 4(F) EVALUATION

FOR THE PROPOSED FEDEX MEMH TRANSFORMATION PROJECT, PROJECT #8648976, AT THE MEMPHIS INTERNATIONAL AIRPORT

SHELBY COUNTY

October 2017

Prepared by:
Dawn Chapman Ashlock, PhD
Circa Archaeology and Historic Preservation
5710 Ogeechee Road, Suite 200-286
Savannah, GA 31405
Phone (912) 272-1425

HISTORIC AND ARCHITECTURAL ASSESSMENT PURSUANT TO 36 CFR PART 800 AND SECTION 4(F) EVALUATION

FOR THE PROPOSED FEDEX MEMH TRANSFORMATIONS, PROJECT #8648976, AT THE MEMPHIS INTERNATIONAL AIRPORT

SHELBY COUNTY

MANAGEMENT SUMMARY

FedEx, with approval by the Federal Aviation Administration (FAA), is proposing to deconstruct or demolish 24 structures and construct several new facilities at the Memphis International Airport in Memphis, Shelby County. The project area is located on the south side of Democrat Road along the northern boundary of the secure airport facility.

Due to the requirement for FAA approval for the proposed undertaking, compliance is required with Section 106 of the National Historic Preservation Act of 1966 and the Department of Transportation Act of 1966, as amended. Regulations dealing with the implementation of the National Historic Preservation Act are codified at 36 CFR Part 800, and those pertaining to the Department of Transportation Act of 1966 are codified at 23 CFR Part 774.

The legislation requires projects receiving federal funding or approval to identify any historic properties within the project area or in the vicinity. For the purposes of this legislation, historic significance is defined as those properties that are listed in or eligible for listing in the National Register of Historic Places. The regulations pertaining to the criteria for eligibility are codified at 36 CFR Part 60.4. If historic resources are identified, the legislation requires agencies to determine if the proposed project would affect the historic resources and if the effect would be adverse. If the proposed undertaking would have an adverse effect to an historic property, the National Historic Preservation Act requires the agency to provide the Advisory Council on Historic Preservation, an independent federal agency, an opportunity to comment on the effect. Due to the location of the proposed undertaking on property owned by the Memphis-Shelby County Airport Authority and administered by the FAA, the Department of Transportation Act requires the agency to complete a Section 4(f) evaluation of the proposed undertaking.

Pursuant to 36 CFR Part 800.4 and 23 CFR Part 774, cultural resource consultants completed an historical survey of the area of potential effect (APE) for the proposed FedEx Transformations project in 2016. The findings of this survey are presented in this report. The consultants identified three World War II era structures, which were constructed circa 1943. Although the two military aircraft hangars have been altered over time, particularly on the interior, it is the opinion of the consultants that they are potentially eligible for listing on the National Register of Historic places due to the unique design of these structures and their association with World War II era development of the Army Air Corps into the Army Air Forces, and the U.S. Air Force following the war. The other World War II era structure is a freestanding Boiler Room that served the two existing hangars and a third hangar that was demolished between 1994 and

1997. The consultants also identified an office building constructed by FedEx in 1973 as the company's first purpose built headquarters. It is potentially eligible based on Criterion A under Criteria Consideration G, due to its association with the early history of FedEx. The 2016 survey did not identify any additional resources that were listed or potentially eligible for listing within the APE.

No National Register-listed properties are located within the project area. The nearest National Register listed property is Graceland. This property was considered to be outside the APE, because the project area was not visible from the property due to its location in a heavily wooded residential neighborhood, 3.5 miles southwest of the proposed undertaking. The consultants also identified three structures in the vicinity of the APE that were potentially eligible and merited further research. Two were circa 1950 single-family residences west of the APE, and the other was a commercial structure constructed east of the APE in 1958. None of these structures were included in this survey. Each was located approximately 1.25 miles from the APE, which was not visible from their locations due to the position of multi-lane roads and commercial and industrial developments.

Pursuant to 26 CFR Part 800.5, the consultants applied the criteria of effect to the proposed undertaking. It is the opinion of the consultants that the project, as currently designed, would have an adverse effect on the World War II era structures and the FedEx Administration Building. As a result, the consultants prepared a Section 4(f) evaluation per the requirements of the Department of Transportation Act of 1966, as amended. The specifications of the proposed project would constitute a use within the meaning of Section 4(f) due to the demolition of the 4(f) properties and the permanent incorporation of the site of these properties into the proposed FedEx Secondary 25 sort facility. Pursuant to 23 CFR Part 774.13(d)(5) of Section 4(f) of the U.S. Department of Transportation Act, when Section 4(f) resources are identified that will require permanent incorporation, the Official with Jurisdiction (OWJ) for the resource must be notified and concur in writing to the Section 4(f) use. When National Register listed or eligible properties are identified as Section 4(f) resources, the OWJ is the State Historic Preservation Officer. In order to document compliance with 23 CFR Part 774.13(d)(5), a written agreement is required for the project file showing that the OWJ concurs with the permanent incorporation of the Section 4(f) resource.

This historic resources survey report provides information about the survey process undertaken by FAA, FedEx, and cultural resource consultants, as well as a detailed report of their findings and determinations for use in conjunction with the accompanying Section 4(f) evaluation.

TABLE OF CONTENTS

DESCRIPTION OF THE PROPOSED UNDERTAKING

FedEx Express (FedEx) is proposing a project to update and modernize its facilities at the Memphis International Airport (MEM) in Memphis, Tennessee. Figure 1 shows the airport location. An outdated package sorting facility would be replaced with facilities specifically designed to accommodate modernized, more efficient equipment. At its core, the purpose of the project is to replace operations, structures and equipment that are approaching the end of their useful life with modern operations, structures and equipment to improve the efficiency of FedEx's business processes. New structures would be constructed using green building standards to the extent possible to limit environmental impacts.

Understanding the Scope of the FedEx Memphis World Hub

In order to understand the significance of the proposed project and the reasons why FedEx has proposed to construct a new secondary sort facility on the location of the Section 4(f) properties discussed in this evaluation, it is useful to briefly address the scope of FedEx operations at the Memphis International Airport (MEM). This unique facility has been the center of FedEx operations throughout the world since 1973. Although regional operations have been augmented through the construction of regional Hubs throughout the world, this facility remains the core of all FedEx operations and is differentiated from regional facilities with the designation as the Super Hub. The operational system that moves nearly all packages to a central hub before transporting them to their final destination is the cornerstone of the entire FedEx business model and has revolutionized the industry. Although the majority of packages arrive at this facility on flights from one of the regional Hubs in order to be sorted and redirected to their final destination, it also serves as a regional Hub by accepting packages from Memphis and the surrounding region, which occur via truck and tractor-trailer receiving docks known as the Bulk Truck Load (BTL). The packages are unloaded, screened, and transferred to the Main and Secondary Sort facilities on conveyor belts and bridge constructed over Sprankel Avenue. Once packages are sorted, they are transferred to each of the departing flights using tugs or ground support equipment (GSE).

The scope of this facility and its importance to FedEx operations and secondary business operations throughout the world is difficult to adequately convey. The Super Hub (Hub) employs over 10,000 people, is over 880 acres in size, and has the capacity to park more than 165 aircraft at a time, which equates to one aircraft landing every 40 seconds during peak operations. The Hub handles approximately 150 flights in and out during its night sort and 90 during its day sort operations. In addition to air cargo, the Hub receives cargo from approximately 130 trucks each night, making the BTL an integral part of operations at this facility. The night sort handles an average of 1.3 million packages, and the day sort averages 500,000 to 600,000 packages. Most of these packages arrive and depart within three hours. This means that the Memphis International Airport is the busiest airport in the world between 10 pm and 4 am. The longstanding importance of this Hub to FedEx and other business operations is demonstrated by the fact that Memphis and Hong Kong have been the busiest air cargo facilities in the world for more than two decades.

The economic impact of the Memphis International Airport and FedEx operations were recently studied by the Sparks Bureau of Business & Economic Research at the University of Memphis. In their 2016 report, they stated that the "Memphis International Airport continues to be the single most important public infrastructure investment available to support economic activity in the Mid-South."[1] That same study emphasized the importance of the Hub in generating that economic activity, noting that cargo aircraft operations made up 60 percent of all air operations at MEM and 99 percent of that cargo is handled by FedEx. When considering the direct, indirect, and induced effects of this operation and the 4.8 billion pounds of air cargo processed in this facility, the researchers estimated that the FedEx cargo operations have resulted in $14.1 billion in the production of goods and services, labor income of over $3.5 billion, 61,517 full and part-time jobs, approximately $740 million in state and local taxes; and $9.5 billion in cargo revenue.

For over four decades, FedEx has invested in this facility and other administrative operations facilities in Memphis. The facility began as several repurposed World War II buildings, Tennessee Air National Guard structures, and a newly constructed FedEx Administration Building. It has been designed and developed over the years to accommodate the traffic flow necessary for employees, trucks, GSE, and aircraft to operate in this facility. As the available land in the secure airport facility has decreased, it has become increasingly important to upgrade existing facilities and maximize operational efficiency, which has led directly to the proposed project.

Project Details

Under the Proposed Development Action, FedEx would deconstruct or demolish 24 outdated structures that are located in the middle of their 880 acre Hub at MEM and are not currently accessible by the public in order to construct several new facilities. At its core, the purpose of the project is to replace operations, structures and equipment that are approaching the end of their useful life with modern operations, structures and equipment to improve the efficiency of FedEx's business processes. New structures would be built using green building standards to the extent feasible to limit environmental impacts. The project would be constructed in phases as funding becomes available. Initially, buildings 1-23 would be demolished and the slabs removed. Next, FedEx would construct the facilities listed below. Finally, after the Secondary 25 sorting facility becomes operational, the Secondary 1-4 would be demolished.

The structures to be demolished or deconstructed are:

1. Hangar #6 (Building 2879)
2. Hangar #7 (Building 2837)
3. Admin (Building 2861)
4. GSE (Building 3099)

[1] University of Memphis, *Sparks Bureau of Business and Economic Research* (http://www.memphis.edu/sbber/reports.php, 2016).

5. Southwide A
6. Southwide B
7. Southwide C
8. Southwide D
9. Southwide E
10. Southwide F
11. Southwide G
12. Building 2860
13. Building 2878
14. Building 2884
15. Building 2875
16. Building 2855
17. Building 2825
18. Building 2838
19. Building 2852
20. Building 380
21. Building 382
22. Building 2826
23. Building 2854
24. North Secondary 1-4

After demolition of buildings 1-23 listed above, and removal of the associated slabs, FedEx would construct several new facilities and improve existing facilities in order to modernize facilities and equipment and improve efficiency.

Under the proposed action, FedEx would construct the following new facilities:

1. Secondary 25 Building – The Secondary 25 sorting facility would have a footprint of approximately 328,000 sq. ft. The building would be 90-100 feet tall and consist of four levels of sort conveyors, process equipment, and office space. The exterior of the building would consist of insulated metal panels, translucent wall panes, and dynamic glazing. Plans are to have the building LEED-certified. The structure would be built south of Sprankel Avenue and north of the North Input structure, and would replace the existing North Secondary 1-4 facility. Its site encompasses all of the current Hangar 7 and Admin Building sites, and part of the Hangar 6 site.

2. Matrix/Secondary 25 Bridge – This would be a new 25,000 sq. ft. conveyor (box truss) bridge extending from the existing East and West Matrix to the new Secondary 25 building. The Matrix/Secondary 25 Bridge would be conditioned and enclosed with the same exterior material system as the other new facilities.

3. Bulk Truck Load (BTL) Building – This would be a new, 65,000 sq. ft. building and contain an automated sort system. The building would be approximately 50-60 feet tall and consist of two levels of sort conveyors, process equipment and office space. The BTL

building would be enclosed with the same exterior material system as described for the Secondary 25 building.

4. Secondary 25/BTL Bridge – This would be a new conveyor (box truss) bridge, approximately 10,000 sq. ft. that extends from the Secondary Sort Building to the new BTL Building. The Secondary 25/BTL Bridge would be conditioned and enclosed with the same exterior material system as the new facilities.

5. Ground Support Equipment (GSE) Maintenance Facility – This would be a new, 6,000 square-foot facility used for maintenance of ground support equipment (GSE). Design of the new structure is not yet complete, but it would be a single story of no more than 30 feet in height. It would be an open space with a slab floor, and would include some storage of lubricants and other items used for routine preventative maintenance of the GSE vehicle fleet, especially oil changes, and also for minor repairs.

Once the Secondary 25 and BTL facilities and sort systems are fully operational, FedEx would deconstruct/demolish the North Secondary 1-4 (2899) facility down to slab level, totaling approximately 167,000 sq. ft. At this time FedEx has no plans regarding the remaining slab. The structures that would be demolished or deconstructed, and the proposed newly constructed structures are shown on Figure 2.

To guide the demolition and deconstruction process, FedEx and its contractors would first prepare a Demolition/Deconstruction Waste Management Plan certified under the Leadership in Energy and Environmental Design (LEED) certification program. The 24 structures and associated slabs would be assessed for the potential to recycle the building materials to the extent feasible, and those portions of the structures would be deconstructed to maintain the value of the recycled materials. Materials with no recycled value would be assessed for hazardous materials content and disposed of in an appropriate landfill. The demolition, deconstruction, and construction contractors would employ industry-standard best management practices (BMPs) that would minimize environmental and human health impacts to the maximum extent feasible.

The purpose of the project is to upgrade and modernize the FedEx Memphis World Hub, which has developed over a 44-year period. During that time, technology and sort systems have improved exponentially, security demands have increased, competition has increased, and upgrading and modernization have become a necessity to sustain the MEM position as FedEx's premier hub. The proposed action would modernize package sorting facilities and improve traffic flow through the FedEx Memphis hub. The sort buildings in the area at issue are the "heart" of the FedEx Hub, and over decades the incredible growth and development at the Hub has radiated outward from that heart. The proposed Secondary 25 sort building must be built in the proposed location, because it has to remain at the heart of the FedEx Hub adjacent to the primary sort building. Overall efficiency would be improved at MEM by eliminating outdated, inefficient facilities, some of which have been vacant for many years, and establishing new staging areas, which would segregate truck movements from the flow of ground service equipment.

The site plan is divided by Sprankel Avenue with employee access/security check points and truck access, staging, and loading areas located north of this road. The existing sort facility is located south of this road near the center of the site. The existing Bulk Truck Load area and associated access roads would be expanded into the adjacent space to the west, which is currently occupied by the vacant TANG and Southwide Center office buildings. This is a reasonable location for these operations, because it provides direct access to Democrat Road, which defines the northern boundary of the secure airport facility and is contiguous to similar existing operations. This location also limits the amount of vehicular traffic into the FedEx facility, which minimizes the potential for tractor trailers and other street legal vehicles from operating in close proximity to the Ground Support Equipment (GSE) necessary to transport sorted packages to aircraft, which improves employee safety. The Secondary 25 sort facility would be located northwest of the existing primary and secondary sort facility in an area currently occupied by Hangar No. 6 and Hangar No. 7, the Boiler Room, and the Administration Building. This is the required location for these operations, because the operations planned for this structure would need to function as an integral part of the existing sort operations.

PUBLIC PARTICIPATION

NATIVE AMERICAN TRIBAL CONSULTATION LIST

FAA has initiated consultation with nine Native American tribes or representatives, by notifying each of the project description and asking if they would like to participate in the Section 106 review process as a consulting party.

David Cook, Kialegee Tribal Town
Karen Brunso, The Chickasaw Nation
Robin Dushane, Eastern Shawnee Tribe of Oklahoma
Kim Jumper, Shawnee Tribe
Eric Oosahwee-Voss, United Keetoowah Band of Cherokee Indians
Corain Lowe-Zepeda, Muscogee (Creek) Nation
Everett Bandy, Quapaw Tribe of Oklahoma
Emman Spain, Thlopthlocco Tribal Town
Daniel Ragle, Choctaw Nation of Oklahoma

The Environmental Division of the Tennessee Department of Transportation prepared and maintains a list of historic groups and other such organizations by county, which might be interested in consulting on proposed projects. According to this list, there are twelve individuals, organizations, and historical societies located in Shelby County. Each have been notified of the project description and asked if they would like to comment on the proposed project.

SHELBY COUNTY AND MEMPHIS PUBLIC PARTICIPATION LIST

Jimmy Ogle, Shelby County Historian
Memphis Area Association of Governments
Mayor Mark Luttrell, Shelby County
Cecelia Franklin, Association for the Preservation of Tennessee Antiquities
Rick Copeland, Memphis and Shelby County Division of Planning and Development
Judy Peiser, Center for Southern Folklore
Laura Todd, Shelby County Historical Commission
Carol Perel, West Tennessee Historical Society
June West, Memphis Heritage, Inc.
Jimmy McNeil, Department of the Army Corps of Engineers, Memphis District
Mayor Jim Strickland, City of Memphis
Brian Bacchus, Memphis Landmarks Commission

PROPERTY OWNERS

Memphis-Shelby County Airport Authority
2491 Winchester Road
Memphis, Tennessee 38116
(901) 398-8375

HISTORIC RESOURCES SURVEY

METHODOLOGY

Federal laws require the FAA to comply with Section 106 of the National Historic Preservation Act of 1966, including amendments effective August 5, 2004 (Attachment 1). This legislation requires the FAA to identify any properties of historic significance affected by proposed undertaking, including above ground buildings, structures, objects, or historic sites, as well as below ground archaeological sites. For the purposes of this legislation, properties with historic significance are defined as those that have been listed in the National Register of Historic Places or are eligible for inclusion in the National Register of Historic Places (Attachments 2 and 3).

In order to comply with Section 106 of the National Historic Preservation Act of 1966 as amended, consultants surveyed the area of potential effect (APE) for this project in compliance with 36 CFR Part 800 regulations. The APE of a potential undertaking is defined in 36 CFR Part 800.16 (d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking." The survey area for this project included the entire APE, as well as historic properties in the project vicinity that may be affected by changes in air quality, noise levels, setting, and land use (Attachment 4).

The purpose of this survey was to identify resources currently listed in the National Register of Historic Places or those that are potentially eligible for inclusion in the National Register of Historic Places (Attachments 2 and 3). In order to identify all listed, eligible, and potentially eligible properties, the survey included two components: a literature review and records search and a field survey. Dawn Chapman Ashlock conducted the literature review and records search between May 2, 2016 and June 15, 2016, and Dawn Chapman Ashlock and Phillip Ashlock II completed the field study between May 9, 2016 and May 13, 2016. These methods contributed to a thorough evaluation of each property with respect to the Criteria and Criteria Considerations, as well as the identification of potential integrity issues.

The literature review included research in the National Register of Historic Places, the state historic resources inventory collected and maintained by the Tennessee Historical Commission, and historic aerial photograph and topographic map collections to develop a timeline for the construction of each of the affected properties. Two additional sources, which were integral to the production of this historic resources survey, include two publications spearheaded by the Air Force Air Combat Command (ACC) and funded by the ACC and the Department of Defense (DoD) Legacy Resource Management Program.[2] Julie L. Webster's thorough research and analysis of military aircraft hangars in the possession of the Department of Defense provided the foundation of this program.[3] This publication was initially unavailable for incorporation into

[2] Julie L. Webster and Gordon L. Cohen, "Military Aircraft Hangars: Footprints through a Century of Flight," *CRM* Vol. 24, No. 3 (2001): 29-31.
[3] Julie L. Webster, *Historical and Architectural Overview of Military Aircraft Hangars: A General*

this report, because it had not been formally reviewed by the Army Corps of Engineers and released for public distribution. The consultants coordinated with the Army Corps of Engineers Construction Engineering Research Laboratory in Champaign, Illinois to expedite the review process, and the report was released to the public on June 15, 2016. Another source that was pivotal to the development of the historical context was Jayne Aaron's expansion upon the Webster publication in 2011 to include military aircraft hangars in the possession of the Reserves and National Guard installations.[4]

In addition to these surveys, the consultants completed a pedestrian survey of the project area to identify and photograph each of the 24 properties scheduled for demolition in the proposed scope of work to determine their location, physical condition, and integrity.

For all historic properties identified in the APE and those beyond the APE that may be adversely affected by the proposed undertaking, the U.S. DOT Act of 1966 requires the completion of a Section 4(f) evaluation in compliance with 23 CFR Part 774 regulations. This evaluation established the requirement for projects receiving funding or requiring approval by an agency of the Department of Transportation to consider historic properties in all transportation development projects. Before funding or approving a transportation development project, the FAA must first establish whether or not there are Section 4(f) properties in the APE. If so, the FAA must either determine that the impacts are *de minimis* or complete a Section 4(f) evaluation. For the purposes of this legislation, a *de minimis* impact is one that will not adversely affect the activities, features, or attributes of an historic property. If the impact is not *de minimis*, the Section 4(f) evaluation must be completed in order to identify a feasible and prudent alternative and ensure that all possible planning to minimize harm has occurred. If a Section 4(f) evaluation identifies a feasible and prudent alternative that has no effect on an historic property, this alternative must be selected. If none of the alternatives are prudent and feasible, the FAA must select the alternative that minimizes the adverse effect to he historic properties.

RESULTS

Consultants accessed the survey records of the Tennessee State Historic Preservation Office (TN-SHPO) to determine if any previous architectural surveys had identified any historic properties in the area. The TN-SHPO has conducted a survey of this portion of Shelby County, and no National Register-listed properties or eligible properties were previously identified within the project area. The nearest National Register listed property is Graceland, which is located 3.5 miles southwest of the project area in a large residential neighborhood (Figure 4). This property was considered to be outside the APE, because the project area was not visible from Graceland due to its location in a heavily wooded residential neighborhood 3.5 miles

---

History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations (Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999).

[4] Jayne Aaron, *Historical and Architectural Overview of Aircraft Hangars of the Reserves and National Guard Installations from World War I through the Cold War,* (Air Force Air Combat Command, 2011).

southwest of the project area. The nearest potentially eligible properties identified in the TN Historical Commission Viewer were located approximately 1.25 miles west of the project area and consist of two circa 1950 single-family dwellings. SY20479 is located in an industrial area west of Plough Boulevard, which is a four lane divided highway forming the western boundary of the airport complex. SY20480 was also a single-family dwelling located adjacent to the previous property in the industrial area, but it has been demolished since the most recent TN-SHPO survey of this area. SY20479 was considered to be outside the APE, because the project area is not visible from this property due to the location of an industrial building located at 2250 Byrn Street. In addition, the area between the industrial development and the project area is obscured by Plough Boulevard and approximately 0.9 miles of aircraft staging, loading, and fueling areas at the FedEx Memphis Airport HUB. The next nearest potentially eligible property identified in the TN Historical Commission Viewer is a 1958 commercial structure located approximately 1.5 miles northeast of the project area at the intersection of Pearson Road and Lamar Avenue. This property, SY35345, was considered to be outside the APE, because the project area is not visible from the property. It is separated from the project area by numerous buildings in a low-rise industrial development, Democrat Road, Tchulahoma Road, and the northeast portion of the Memphis International Airport and the FedEx ramp, which includes the low to mid-rise Memphis Air Route Traffic Control Center and the eastern FedEx employee security and training facilities (Figure 3).

As a result, the consultants limited the APE to the area to be included in the proposed project (Figure 5). Democrat Road defines the boundary on the north side of the APE. Hurricane Creek, Independent Drive, and Republican Drive define the boundary on the east. Sprankel Avenue and the GSE lanes south of Hangar No. 6 and the North Secondary Sort 1-4 define the boundary on the south. The GSE lanes west of the North Secondary Sort 1-4 and Hangar No. 7, Sprankel Avenue, Tang Street, Technocrat Lane, the GSE lanes west and north of Building 2878 and Building 2860, and Southwide Drive define the boundary on the west.

Consultants performed a field survey of the APE between May 9, 2016 and May 13, 2016. This field survey located and photographed all properties in the APE to be demolished in the proposed undertaking and identified and documented all potentially eligible historic properties in the APE. Although the primary objective of the survey was to determine the potential for National Register eligibility of any individual resources or historic districts in the area, it also collected information on the setting, structural condition, history, and integrity of each of the potentially eligible historic properties. In total, the field survey inventoried 24 properties, collecting varying levels of information depending on the date of construction, integrity, and history of each property. This included the Southwide Center buildings, TANG buildings, FedEx ground support equipment (GSE) hydrogen fueling station, FedEx Administration Building, FedEx paint shop, and the World War II military aircraft hangars and associated Boiler Room.

The consultants did not believe that the Southwide Center buildings or the FedEx paint shop met the eligibility requirements for inclusion on the National Register of Historic Places. Although they did not believe that the TANG buildings or the FedEx GSE hydrogen test facility met the eligibility requirements, they gathered additional information for these buildings due

to the possibility that they may be considered potentially eligible under Criterion Consideration G. At the conclusion of the field survey, the consultants believed that the FedEx Administration Building had the potential to meet the eligibility requirements under Criteria Consideration G. As a result, interior and exterior photographs were taken of the building and additional information was collected. Due to the age and unique design of the World War II military aircraft hangars and associated Boiler Room, the consultants believed that all of the World War II era structures met the eligibility requirements for inclusion on the National Register of Historic Places.

INVENTORY

The following is an inventory of all buildings located within the APE to be demolished in the proposed undertaking. The buildings fall into four groups, those constructed by the federal government, Southwide Development Company, Inc., the Tennessee Air National Guard, and FedEx. An historical context and assessment is provided for each of these building groups following the inventory.

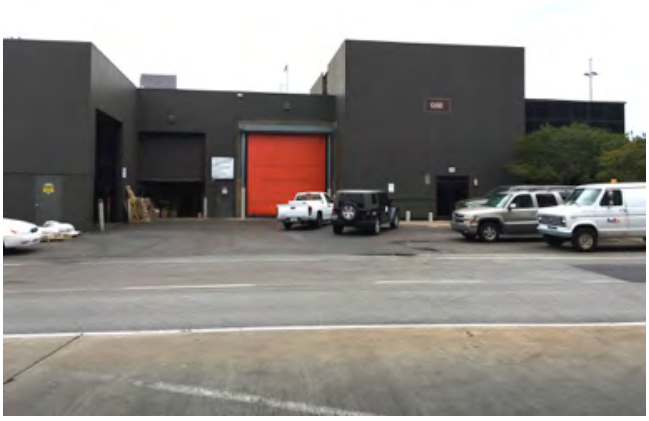
Building Number	Description	Photograph (None of the charted properties were previously surveyed)
2879	Hangar No. 6 Date: circa 1943 North-South: 222 ft East-West 213 ft Height: 65 ft Floors: 2-3 Foundation: concrete slab and CMU Walls: wood frame and wood siding covered with metal wall panels Roof: wood bow truss with built-up roof	

2837	Hangar No. 7 Date: circa 1943 North-South: 206 ft East-West 213 ft Height: 65 ft Floors: 2-3 Foundation: concrete slab and CMU Walls: wood frame and wood siding covered with metal wall panels Roof: wood bow truss with built-up roof	
2838	Boiler Room Date: circa 1943 North-South: 35 ft East-West 58 ft Height: 32 ft Floors: 1 Foundation: concrete slab Walls: concrete masonry unit Roof: metal trusses, purlins, and roof panels	
2852	Paint Shop Date: circa 1945-1956 North-South: 42 ft East-West 50 ft Height: 20 ft Floors: 1 Foundation: concrete slab Walls: wood frame and pressed board siding Roof: wood joists with membrane roof	

Southwide A	Southwide Center Building A Date: circa 1972 North-South: 100 ft East-West 242 ft Height: 15 ft Floors: 1 Foundation: concrete slab Walls: typical condition 10’6” wide x 14’6” high precast concrete panels Roof: metal bar joists with metal roof deck and built-up roof	
2861	Administration Building Date: 1973-1975, additions in 1987 and 1988 North-South: 98 ft East-West 197 ft Height: 45 ft Floors: 3 Foundation: concrete slab and footings Walls: concrete masonry unit with brick veneer, curtain wall Roof: steel bar joists, metal roof deck, and built-up roof	
Southwide B	Southwide Center Building B Date: 1974 North-South: 100 ft East-West 338 ft Height: 15 ft Floors: 1 Foundation: concrete slab Walls: typical condition 10’6” wide x 14’6” high precast concrete panels Roof: metal bar joists with metal roof deck and built-up roof	

Southwide C	Southwide Center Building C Date: 1974 North-South: 90 ft East-West 181 ft Height: 15 ft Floors: 1 Foundation: concrete slab Walls: typical condition 10’6” wide x 14’6” high precast concrete panels Roof: wood beams and purlins with plywood decking and built-up roof	
Southwide D	Southwide Center Building D Date: 1974 North-South: 90 ft East-West 212 ft Height: 15 ft Floors: 1 Foundation: concrete slab Walls: typical condition 10’6” wide x 14’6” high precast concrete panels Roof: wood beams and purlins with plywood decking and built-up roof	
Southwide E	Southwide Center Building E Date: 1974 North-South: 100 ft East-West 338 ft Height: 15 ft Floors: 1 Foundation: concrete slab Walls: typical condition 10’6” wide x 14’6” high precast concrete panels Roof: wood beams and purlins with plywood decking and built-up roof	

Southwide F	Southwide Center Building F Date: 1974 North-South: 100 ft East-West 121 ft Height: 15 ft Floors: 1 Foundation: concrete slab Walls: typical condition 10’6” wide x 14’6” high precast concrete panels Roof: wood beams and purlins with plywood decking and built-up roof	
NSS 1-4	North Secondary Sort 1-4 Date: circa 1974, addition 1980 North-South: 140 ft East-West 850 ft Height: 40 ft Floors: 1 Foundation: concrete slab Walls: metal frame and wall panels Roof: metal frame and roof panels	
380	Tennessee Air National Guard Ammunition Storage Date: circa 1975-1980 North-South: 42 ft East-West 12 ft Height: 12 ft Floors: 1 Foundation: concrete slab Walls: cast concrete Roof: cast concrete with metal cap	

382	Tennessee Air National Guard Ammunition Storage Date: circa 1975-1980 North-South: 7 ft East-West 7 ft Height: 12 ft Floors: 1 Foundation: concrete slab Walls: cast concrete Roof: cast concrete with metal cap	
Southwide G	Southwide Center Building G Date: circa 1977-1980 North-South: 90 ft East-West 390 ft Height: 15 ft Floors: 1 Foundation: concrete slab Walls: typical condition 10’6” wide x 14’6” high precast concrete panels Roof: wood beams and purlins with plywood decking and built-up roof	
3099	GSE Maintenance Date: circa 1980-1981 North-South: 165 ft East-West 225 ft Height: 40 ft Floors: 1 Foundation: concrete slab Walls: metal frame and wall panels, curtain wall Roof: metal joists and roof panels	

2825	Tennessee Air National Guard Composite Squadron Operations Facility Date: 1985 North-South: 226 ft East-West 147 ft Height: 45 ft Floors: 2 Foundation: concrete slab Walls: concrete masonry unit and brick veneer, Alucobond panels, curtain wall Roof: steel bar joists or I beams, metal roof deck, and built-up roof	
2826	Garage Date: circa 1985-1986 North-South: 200 ft East-West 70 ft Height: 15 ft Floors: 1 Foundation: concrete slab Walls: metal frame and wall panels Roof: metal joists and roof panels	
2878	ADAL Civil Engineering Maintenance Complex Date: circa 1985-1990, addition 1995 North-South: 169 ft East-West 122 ft Height: 20 ft Floors: 1 Foundation: concrete slab Walls: concrete masonry unit, brick, metal wall panel Roof: metal joists and deck with built-up roof	

2875	Tennessee Air National Guard Composite Building Date: 1989 North-South: 177 ft East-West 142 ft Height: 40 ft Floors: 1 Foundation: concrete slab Walls: 6” metal stud with brick veneer, curtain wall Roof: Pitched - steel I-beams, metal roof deck and metal roof. Flat - steel bar joists, metal roof deck, and elastomeric roof membrane	
2855	Tennessee Air National Guard C-141 Flight Simulation Facility Date: 1995 North-South: 139 ft East-West 112 ft Height: 45 ft Floors: 1 Foundation: concrete slab Walls: CMU with brick veneer, structural steel, 4” metal stud with aluminum wall panels Roof: steel bar joists, metal roof deck, and elastomeric roof membrane	
2860	Open Storage Shed Date: circa 1994-1997 North-South: 31 ft East-West 118 ft Height: 12 ft Floors: 1 Foundation: concrete footings Walls: metal frame and wall panels Roof: metal joists and roof panels	

2854	Storage Building Date: circa 1997-2003 North-South: 32 ft East-West 20 ft Height: 15 ft Floors: 1 Foundation: concrete slab Walls: metal frame and wall panels Roof: metal joists and roof panels	
2884	GSE Hydrogen Test Facility Date: 2014 North-South: 43 ft East-West 59 ft Height: 45 ft Floors: n/a Foundation: concrete slab Walls: n/a Roof: n/a	

HISTORICAL CONTEXT

The proposed project is located in south Memphis along the northern extents of the Memphis International Airport property, which is owned by the Memphis-Shelby County Airport Authority. The project area is in the north central portion of the FedEx Ramp. This area is bounded by Plough Boulevard on the west, Democrat Road on the north, and Tchulahoma Road on the east. The southern boundary is formed by Runway 9/27 and its associated taxiways. The surrounding areas consist of commercial and industrial buildings. Mid-twentieth century residential neighborhoods are located behind these commercial and industrial properties, but these neighborhoods are transitioning to commercial and industrial uses and are shielded from view of the APE by the commercial and industrial buildings, multi-lane roads, existing FedEx aircraft staging, loading, and fueling areas, and existing FedEx employee security and training facilities.

The beginnings of the aviation industry in Memphis, Tennessee arose in 1927 under the direction of Memphis city mayor, Watkins Overton, who established the Municipal Airport Planning Commission. Initial objectives of the newly developed commission included the selection of a suitable location to construct the new Memphis Airport being proposed. The commission settled on a tract of land approximately seven miles from downtown Memphis, known as Ward Farm, which encompassed nearly 200 acres to allow for potential future expansions of aviation activities and growth in the rural countryside. The Memphis Municipal Airport was originally made up of a sod airfield and runway including three hangars for aircraft. The facility opened and was dedicated on June 14, 1929, servicing upwards of 15 passengers daily within the coming year by way of two major airline services, Chicago and Southern Airlines and American Airlines. In 1938, the demands accompanying an increase in passengers gave way to the development of a contemporary terminal for the Memphis Airport.[5]

Upon entrance of the United States in World War II, the Memphis Airport and Memphis Air Field were placed under the command and control of the U.S. Army where U.S. Army Air Force operations were conducted in support of the war. This activity delayed further development and expansion of commercial aviation operations until 1947 when military presence and troops were withdrawn, allowing once again the growth of commercial airline operations in the post-war era. In 1956, a new Memphis Airport Planning Commission was formed and set to the task of engineering a new state-of-the-art terminal to accommodate growth. In the following years, the Memphis Municipal Airport underwent a series of name changes, as a result of new "Jet Age" technology and expansion in the aviation industry. 1963 ushered in a renaming to the Memphis Metropolitan Airport, and eventually evolved to international status in 1969 with a subsequent renaming as Memphis International Airport to account for its accommodation of international passengers and cargo. The creation of the Memphis-Shelby County Airport Authority also occurred in 1969 in an effort to manage the rapid expansion of aviation in Memphis.

[5] Fly Memphis.com, "Airport History." http://www.flymemphis.com/Airport-History.

In 1973, Memphis International Airport realized this development and expansion of aviation as a result of the founding of FedEx when the company based the center of their cargo and shipping operations on the Memphis Air Field along with an Administration Building and sorting facility. Fedex's 24/7 operations, along with a massive package-sorting complex, ultimately identified as a Super HUB, would place the Memphis International Airport as a world-class aviation facility holding the record as the busiest cargo airport in the world from 1992 to 2009. This record has only recently been surpassed globally by Hong Kong, and Memphis remains number one domestically for air cargo shipments. In 2004, the Airport Authority for the Memphis International Airport negotiated a land exchange involving FedEx and the Tennessee Air National Guard (TANG). This exchange provided critical space for facilities in the southeast corner of the airfield to operate the large C-5 Galaxy transport aircraft used in missions by the Air Force, and subsequently opened up available space for FedEx to expand operations in the northern portion of the airport facility.[6]

It is the opinion of the consultants that the commercial and industrial properties adjacent to the FedEx Ramp and the residential neighborhoods located behind them did not appear to be potentially eligible for listing in the National Register of Historic Places and did not merit further evaluation for NRHP eligibility for reasons such as:

- Structures did not meet the 50 year age requirement for eligibility;
- Alterations and deterioration had damaged the integrity of the resources;
- Structures were not known to possess architectural significance; and/or
- Structures were not known to possess historical significance.

WORLD WAR II BUILDINGS

History

Army Air Corps and Army Air Forces, Military, United States, 1939 to 1945

World War II was an important period in the development in the use of aircraft in the United States (U.S.) armed forces. During this time, the U.S. Army Air Corps (AAC) expanded exponentially and transitioned into the U.S. Army Air Forces (AAF), which paved the way for the establishment of the U.S. Air Force as an independent branch of the armed forces following World War II. In early 1939, President Roosevelt proposed the expansion of the Air Corps, which consisted of only 25,000 personnel and 525 aircraft[7] before the war. Over the next six

[6] Historic Memphis, *Historic Memphis Airport… in Vintage Photos and Postcards.* http://historic-memphis.com/memphis-historic/airport/airport.html

[7] Julie L. Webster, *Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations* (Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999), 4-16.

years, the U.S. government would spend more than $3.1 billion expanding the number of personnel, aircraft, and support facilities.[8]

Army Air Corps Expansion and Construction Programs

There were four phases of expansion in the size and strength of American air power before and during the war. The first occurred in April 1939, prior to the German invasion of Poland in August of that year, when Congress authorized the expansion of the AAC to include 24 groups, which included 48,200 personnel and 6,000 aircraft. By the summer of 1940, it was clear that these levels would not be sufficient if the U.S. entered the war. In the autumn of 1940, Congress authorized the expansion of the AAC to include 54 combat groups, including 50,000 aircraft and an additional 50,000 aircraft each year for the duration of the war. In the spring of 1941, the AAC was expanded to include 84 combat groups, which were intended to be operational by the summer of 1942. Shortly before the U.S. entered the war in December 1941, following the Japanese attack on Pearl Harbor, Congress authorized the expansion of the AAC to an astounding 239 groups.[9] Before the implementation of this plan, it was revised a final time to include 273 groups. [10] These authorizations amounted to an increase of approximately 1140% between 1939 and 1943. The expansion in air power necessitated a corresponding increase in the number of tactical air fields, training facilities, and depot facilities, where aircraft would be stored, repaired, and modified.

Even though Congress ultimately authorized $3.1 billion to fund the expansion, construction struggled to keep up with the expansion in personnel and aircraft. In order to expedite the process, the Construction Division of the Quartermaster Corps determined that all non-technical construction should be considered temporary in nature.[11]

In the midst of the implementation of the 24-Group Plan at the end of 1940, all AAC construction projects were officially transferred from the Construction Division to the Army Corps of Engineers (ACE).[12] The ACE continued to use many of the standardized plans established by the Construction Division and reaffirmed the policy of temporary plans for all non-technical construction.[13] When the next phase of construction began for the 54-Group Plan,

---

[8] Webster, 4-16.

[9] Jerold E. Brown, *Where Eagles Land: Planning and Development of U.S. Army Airfields, 1910-1941* (New York: Greenwood Press, 1990), 116.

[10] Julie L. Webster, *Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations* (Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999), 4-2.

[11] Frank Futrell, "The Development of Base Facilities," in *The Army Air Forces in World War II, vol. VI,* ed. Wesley Frank Craven and James Lea Cate, 127-128.

[12] Julie L. Webster, *Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations* (Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999), Webster, 4-5.

[13] Robert Mueller, *Air Force Bases: Active Air Force Bases within the U.S.A. on 17 September 1982*

most of the tactical fields were quickly established through the acquisition of civil air fields and the allocation of $100 million to make improvements and other modifications at 400 of these fields. Beginning in the spring of 1941, the 84-Group Plan was implemented with the focus remaining on establishing new training and depot facilities.[14]

Army Air Forces Expansion and Construction Programs

In June 1941, the War Department established the AAF. Although it remained a part of the Army, it began to function as an independent branch of the armed forces, with an equal standing on the General Staff as the other branches.[15] In the autumn of 1941, Congress approved the 239-Group Plan. Within a week of the attack on Pearl Harbor, the proposal emerged that would increase the AAF to its largest size, the 273-Group Plan, even though it would not be formally approved until late 1942.[16] Similar to the previous expansions, the construction projects associated with the final phase of construction were less focused on tactical facilities and more focused on training and depot facilities that produced pilots, flight crews, and aircraft for deployments overseas. At about the same time that the 273-Group Plan was in place, AAF construction projects in the U.S. slowed to a halt, and the government began disposing of excess properties, because the majority of AAF personnel and aircraft were deployed overseas by the end of 1943.

Based on the placement of the Memphis Army Air Field at the Memphis Municipal Airport, it is likely that this air field was established as a part of the 54-Group Plan in late 1940, when the AAC used existing civil air fields to expedite the construction of tactical fields. This would place the Memphis Army Air Field among a group of approximately 400 tactical fields intended to be operational as quickly as possible in order to protect the home front.

Architectural Description

There are three property types associated with the resources in this Historic Resources Survey. The primary property type is a variant of the OBH-2 and A.T.C. Birchwood Hangar types. Three of these hangars (Figures 6 and 7) were constructed in a line oriented east to west in the northeast corner of the Memphis Army Airfield during World War II between 1940 and October 22, 1943, when they appear in an aerial photo of the air field (Figure 10). They were designated as Hangar No. 6 (2879), Hangar No. 7 (2837), and Hangar No. 8. The westernmost of these structures, Hangar No. 8, was demolished in the mid 1990s, and the other property type served in a support capacity to the hangars. It is a free-standing Boiler Room (2838) (Figures 8 and 9) located north of Hangar No. 7 (2837) on the opposite side of Sprankel Avenue and is connected to Hangar No. 7 (2837) by an underground utility corridor (Figure 10). As this was originally the

(Washington, DC: Office of Air Force History, 1989), 127-128.

[14] Frank Futrell, "The Development of Base Facilities," in *The Army Air Forces in World War II, vol. VI,* ed. Wesley Frank Craven and James Lea Cate, 137-141.

[15] Bill Yenne, *The History of the U.S. Air Force* (New York: Exeter Books, 1984), 26.

[16] Frank Futrell, "The Development of Base Facilities," in *The Army Air Forces in World War II, vol. VI,* ed. Wesley Frank Craven and James Lea Cate, 131-132 and 135-137.

central hangar, it is likely that this utility corridor intersected with another one that connected each of the hangars.

The Army constructed two types of wood hangars that may be related to Hangar No. 6 (2879) and Hangar No. 7 (2837). The architectural details are most closely related to the OBH-2 hangars (Figure 11), while the scale of the hangers is consistent with the A.T.C. Birchwood hangars (Figure 12). Eleven bowstring trusses form the roof structures of Hangar No. 6 (2879) and Hangar No. 7 (2837) and bear on single-laced wood truss columns along the north and south walls of the hangar (Figures 7 and 13). The roof truss and associated column assemblies are stabilized laterally by double-laced, horizontal wood trusses located near the center and at the top of the north and south walls. The east and west walls have sliding doors that originally opened to the north into door pockets that flank the east and west ends of a two-story office block, creating an asymmetrical facade on the east and west sides of the hangar. The wall opposite the office block has 10 bays, with each containing three levels of four, double-hung windows. In total, this wall of the hangar originally had 120 double-hung windows with 9 over 9 lite configurations (Figure 7). These construction details are most closely related to the OBH-2 hangar (Figure 11). The scale of Hangar No. 6 (2879) and Hangar No. 7 (2837) is significantly larger than the OBH-2 hangars and is more closely aligned with the A.T.C. Birchwood hangars, which enclose approximately 40,000 sq. ft. (Figure 12). The most notable difference between the Memphis Army Air Field hangars and the A.T.C. Birchwood hangars is the placement of the office block. The A.T.C. Birchwood hangars evenly divide the office space along each side of the hangar. This creates a simple buttress, which provides lateral support for the walls bearing the load of the bowstring arch roof trusses. It also allows the door at each end of the building to open from the center and slide into symmetrical door pockets at the end of each office block. In the absence of an office block on the north and south sides of the Memphis Army Air Field hangars, the load bearing walls on these sides of the building required additional bearing capacity and lateral stability. In this case, single-laced wood truss columns carry the additional load, and double-laced, horizontal wood trusses provide lateral stability. In addition, Hangar No. 6 (2879) and Hangar No. 7 (2837) have tension rods that stabilize the top of the north and south walls and prevent the outward thrust of the bowstring arch from deflecting the north and south walls.

According to an analysis of the use of timber products during the war, softwood lumber accounted for 83% of total output. In 1942, at approximately the same time that the air field was being constructed, 75% of softwood lumber was used for construction. Based on this data, it is likely that the wood used to construct the hangars was a clear-grained soft wood, such as a Douglas Fir.[17] Definitive materials testing and analysis should be employed to verify the species of wood used and confirm the potential for a rare materials application associated with an economic theme during wartime construction.

[17] Ben Meyer Huey, "Problems for timber products procurement during World War II, 1941 to 1945," (Thesis, University of Montana, 1951), 36.

The Boiler Room (2838) is a support structure for Hangar No. 6 (2879) and Hangar No. 7 (2837) and appears in the aerial image dated October 22, 1943. It is likely that the building was constructed at the same time as the hangers. The building is constructed of concrete block with a corrugated metal roof. The most significant character-defining feature on its exterior is the 6-lite awning windows. It is connected to Hangar No. 7 (2837) by an underground utility corridor (Figure 9) that is oriented north to south and passes under Sprankel Avenue. Since this utility corridor connects to Hangar No. 7 (2837), which was originally the central hangar, it is likely that this utility corridor intersected with another one that connected each of the hangars.

Significance

The significance of aircraft hangars in relation to the overall history of military aviation cannot be overstated. Webster and Cohen referred to aircraft hangars as the "alpha" building type on any military airfield and suggested that the entire history of military aviation can be gleaned from the form, function, and style of this building type.[18] In Webster's seminal historic context statement, she developed an overview that allows military and civilian cultural resource managers to evaluate the significance of specific aircraft hangars in a wider context. One of the most striking aspects of this work in relation to Hangar No. 6 (2879) and Hangar No. 7 (2837) at the Memphis Army Air Field is the relative rarity of wood frame construction in extant World War II era military aircraft hangars. This survey, conducted in 1999, revealed that only 2% of the historic military aircraft hangars in the possession of the Department of Defense (DoD) were constructed of wood.[19] These numbers have continued to diminish in the ensuing eighteen years. When considering only the wood hangars constructed with a bowstring arch, the 1999 survey identified seventeen structures with three plan types: Squadron OBH-2, A.T.C. Birchwood, and wood Bowstring Truss hangars with an unspecified plan type. There were three remaining Squadron OBH-2 hangars, twelve A.T.C. Birchwood hangars, and two unspecified plan types.

An analysis of the current status of each hangar indicates that 100% of the Squadron OBH-2 hangars identified in 1999 remain, while 42% of the A.T.C. Birchwood hangars have been demolished or destroyed by fire, and at least 50% of the unspecified plan types have been demolished. This reduced the number of wood bowstring truss hangars by a minimum of 35%. This data is particularly important in the evaluation of significance of Hangar No. 6 (2879) and Hangar No. 7 (2837), because Webster argues that the significance of a particular hangar "may rest on the fact that it is the earliest, best or last existing example of a type,"[20] which can only be assessed in the context of a national-level survey. She continues to state "it may be feasible

[18] Julie L. Webster and Gordon L. Cohen, "Military Aircraft Hangars: Footprints through a Century of Flight," *CRM* Vol. 24, No. 3 (2001): 29-31.
[19] Julie L. Webster, *Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations* (Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999), 7-6.
[20] Webster, 7-1.

Squadron OBH-2, Plan No. 117/6-3, First Use Unknown				
Base	Date	Building No.	Status	Status Date
Wright-Patterson AFB, OH	1943	30148	Extant	10/2015
NAS Fallon, NV	1944	4(5)	Extant	5/25/2014
NAS Whidbey Island, WA	1942	112	Extant	3/2016
A.T.C. Birchwood Type 202' x 200', Plan No. Varies, First Known Use Mid-1940s				
Base	Date	Building No.	Status	Status Date
Elmendorf AFB, AK	WWII	n/a	Extant	6/2016
Elmendorf Aux., AK (Eareckson AFS)	Unknown	502	Extant	9/16/2014
Elmendorf Aux., AK (Eareckson AFS)	Unknown	521	Extant	9/16/2014
Elmendorf Aux., AK (Galena Airport)	WWII	1428	Demolished	7/4/2005
Elmendorf Aux., AK (Galena Airport)	WWII	1551	Demolished	7/4/2005
Ft. Wainwright, AK	WWII	3008	Demolished	2014
Ft. Wainwright, AK	WWII	3005	Demolished	2014
Ft. Wainwright, AK	WWII	2085	Demolished	7/21/2005
Mountain Home AFB, ID	1943	201	Extant	5/9/2015
Mountain Home AFB, ID	1943	204	Extant	5/9/2015
Mountain Home AFB, ID	1943	205	Extant	5/9/2015
Mountain Home AFB, ID	1943	208	Extant	5/9/2015
Wood Bowstring Truss, Plan No. Unknown, First Use Unknown				
Base	Date	Building No.	Status	Status Date
Offutt	WWII	321	Unknown	Unknown
Ft. McPherson, GA (Ft. Gillem)	1942	922	Demolished	2/2002

Table 1: Excerpt from Webster's 1999 survey of military aircraft hangars on DoD installations listing World War II era hangars constructed with a wood bowstring truss roof structure. The list is sorted by plan type and includes information on the installation, the date of construction, the building number, its status, and the date that this status was confirmed through aerial imagery.

and justifiable to use documentation of the nation's best example of a hangar type to represent the remaining examples for purposes of mitigation."[21] In conclusion, Webster recommended that the "best surviving example of each major aircraft hangar type on U.S. military installations be identified… and that these prime examples then be documented according to the Level II protocols specified by the Historic American Buildings Survey (HABS)." Given that this research did not identify any other hangars with a similar asymmetrical floor plan or truss column

[21] Julie L. Webster, *Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations* (Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999), 7-2.

construction as Hangar No. 6 (2879) and Hangar No. 7 (2837), it is reasonable to suggest that Webster's recommendations are considered prior to the demolition of these structures.

The Boiler Room (2838) appears to be potentially eligible under Criterion A, based on its association with the domestic war effort, the rapid development of the Army Air Corps and Army Air Forces during World War II, and its role as a support structure to Hangar No. 6 (2879) and Hangar No. 7 (2837). Since only minor modifications have been made to this structure over time, it retains a significant amount of integrity.

SOUTHWIDE CENTER BUILDINGS

History

The Southwide Development Company, Inc. hired architect Keith S. Kays to design a series of commercial buildings on the south side of Democrat Road in 1972. Surviving drawings indicate that Kays, who remains a practicing architect in Memphis and currently serves as the Chairman of the Landmarks Commission, completed drawings for these buildings between 1972 and 1977. The purpose of the buildings was to provide leasable commercial space in the developing area between Memphis and what was known as the International Airport, and the company constructed the Southwide Center Buildings as leased commercial units. The seven buildings, named Building A through G, were constructed between 1972 and 1980. The original drawings indicate that the plans for Building A were completed in 1972, and the plans for Buildings B through F were completed in 1974. Although there are no drawings available that indicate the construction date of the final building in this complex, Building G, a review of aerial images and topographic maps show that it was constructed between 1977 and 1980.

Architectural Description

The Southwide Center buildings are single story commercial buildings containing multiple units with both office and warehouse space. The exterior of the buildings conformed to a similar design, which included exterior walls constructed of 10'6" wide by 14'6" high precast concrete panels with a 5" recessed horizontal band 9'7" above the foundation. This line defines the openings of the recessed entries on the front façade and the roll-up doors on the rear façade. The roof structure of Buildings A and B are composed of metal bar joists, a metal roof deck, and a built-up roof. The roof structure of the remaining buildings is composed of wood beams and purlins, plywood decking, and a built-up roof. On the interior, the buildings conform to one of two building types. The first group includes Buildings A, B, E, and G, which were constructed with 24' wide bays that can be subdivided into varying sized units. The second group includes Buildings C, D, and F and was constructed with 15' bays, resulting in the potential for smaller units.

It is the opinion of the consultants that the Southwide Center buildings do not appear to be potentially eligible for listing in the National Register of Historic Places and did not merit further evaluation for NRHP eligibility for the following reasons. The structures did not meet the 50

year age requirement for eligibility, are not architecturally significant, and do not possess any historical significance.

TENNESSEE AIR NATIONAL GUARD (TANG) BUILDINGS

History

The Tennessee Air National Guard (TANG) traces its earliest origins back to the First Squadron, Air Service, Tennessee National Guard recognized formally by Adjutant General Baxter Sweeney on October 1, 1920. Continuing through the post-WWI era, the first aircraft squadron in Tennessee was federally recognized and organized as the 136th Air Observation Squadron on December 4, 1921, eventually being re-designated as the 105th Air Observation Squadron on July 20, 1923.

The progression of military aviation through WWII led to advancements in aviation and the establishment of designated Air National Guard units with mission specialties including the 155th Fighter Squadron formally recognized federally on December 23, 1946 in Memphis, Tennessee. In 1951, the unit was transferred to Shaw AFB, South Carolina, and re-designated a Tactical Reconnaissance Squadron (TRC). By 1953, the 155th Tactical Reconnaissance Squadron was returned to state control in Tennessee and firmly established a base of operations at the Memphis Air National Guard Base (ANGB). On April 1, 1961, the 155th Tactical Reconnaissance Squadron reached a significant transition in operations that began with the attachment to a parent unit known as the 164th Air Transportation Group (Heavy) ushering in a new era for the 155th in military airlift capability and a re-designation to its new unit, the 164th Air Transportation Squadron (Heavy). Eventually the unit transitioned to be called the 164th Military Airlift Group (MAG) into the post-Vietnam era until the unit was re-designated as the 164th Tactical Airlift Group (TAG). Following operations in Desert Storm / Shield in the early 1990s the unit was re-designated again in April 1992 as the 164th Airlift Group (AG) still based out of Memphis. In 1995, the unit took on its current re-designation as the 164th Airlift Wing (AW).

The Tennessee Air National Guard (TANG) in coordination with the Memphis Airport Authority and FedEx conducted a land exchange in September 2004 resulting in the relocation of all Memphis TANG facilities to the southeastern section of the Memphis Airfield. This transition of space enabled new construction of facilities for the 164thAirlift Wing (AW) to accommodate the most recent aircraft in their operational readiness inventory known as the C-5 Galaxy. The dedications of these new TANG facilities occurred in September 2008 and are currently occupied by the 164th Airlift Wing.[22]

[22] Air National Guard, *Unit History of the 164th Airlift Wing.* http://www.164aw.ang.af.mil/Units/.

Architectural Description

Fourteen of the buildings included in this survey were used or constructed by TANG during their occupancy of the project area south of Democrat Road. Hangar No. 6, Hangar No. 7, and the Boiler Room were assumed by TANG following World War II. AAF facilities of the type constructed at the Memphis Air Field were typically only partially occupied and increasingly empty in the final two years of the war. 79 AAF air fields were disposed of in 1944 and 1945. In excess of 150 other air fields were "mothballed" and disposed of at the end of the war,[23] reducing the total number of air fields by nearly one half. Due to an incomplete chain of title, it is not clear when the Memphis Army Air Field was transferred to the Tennessee Air National Guard (TANG), but it most likely occurred in 1944 or 1945. Since the function of the air field would have been fairly consistent when operated by the AAF and the TANG, it is more likely that modifications to the facilities on the airfield would have been minimal during these years. The remaining eleven buildings were constructed by TANG for use at this location beginning in the early 1960s and ending with the land exchange with the Memphis Airport Authority in 2004.

The building currently known as the FedEx Paint Shop (2852) was constructed by TANG between 1945 and 1956. Although this structure was determined to exceed the fifty-year threshold, the original function of the building is unknown, and the building has been heavily modified, further obscuring its original use. As a result, this building does not appear to be potentially eligible for the NRHP.

TANG constructed the original portion of the building currently known as the North Secondary Sort 1-4 in 1974. The original function of the building is unknown, but its relative proximity to aircraft hangars, taxiways, and runways suggest that it may have been involved with aircraft maintenance and operations. This is also supported by the utilitarian nature of its construction, which utilizes a metal frame, wall panels, and roof panels. Since this building does not exceed the fifty-year threshold for eligibility for the NRHP and does not appear to be significant based on its architecture or association with significant events or persons, this building does not appear to be potentially eligible for the NRHP.

Buildings 380 and 382 were constructed by TANG between 1975 and 1980 for use as ammunition storage facilities. Since these buildings do not exceed the fifty-year threshold for eligibility for the NRHP and are not known to possess exceptional significance based on their architecture or association with significant events or persons, they do not appear to be potentially eligible for the NRHP.

In 1985, TANG commissioned the design and construction of the Composite Squadron Operations Facility (2825). This building was designed by Walk Jones & Francis Mah, Inc. of Memphis Tennessee to support TANG operations. Since this building does not exceed the fifty-year threshold for eligibility for the NRHP and is not known to possess exceptional significance based on its architecture or association with significant events or persons, this building does not appear to be potentially eligible for the NRHP.

[23] Webster, 4-16.

TANG constructed the building currently known as Building 2826 between 1985 and 1986. The original function of the building is unknown, but the incorporation of thirteen overhead doors along the west facade suggests that it may have been involved with vehicle maintenance operations and storage. This is also supported by the utilitarian nature of its construction, which utilizes a prefabricated metal frame and metal wall and roof panels. Since this building does not exceed the fifty-year threshold for eligibility for the NRHP and does not appear to be significant based on its architecture or association with significant events or persons, this building does not appear to be potentially eligible for the NRHP.

The ADAL Civil Engineering Maintenance Complex (2878) was constructed by TANG between 1985 and 1990, with an addition constructed in 1995. The Pickering Firm, Inc. of Memphis, Tennessee provided both architecture and engineering services for the design of this building, which was intended to support TANG maintenance operations. Since this building does not exceed the fifty-year threshold for eligibility for the NRHP and is not known to possess exceptional significance based on its architecture or association with significant events or persons, this building does not appear to be potentially eligible for the NRHP.

In 1989, TANG commissioned the design and construction of the Composite Building (2875). This building was designed by Taylor Gardner Montgomery Architects of Memphis Tennessee to support TANG personnel, including food service and medical facilities. Since this building does not exceed the fifty-year threshold for eligibility for the NRHP and is not known to possess exceptional significance based on its architecture or association with significant events or persons, this building does not appear to be potentially eligible for the NRHP.

The C-141 Flight Simulation Facility (2855) was constructed by TANG in 1995 to support C-141 flight crew training operations. Since this building does not exceed the fifty-year threshold for eligibility for the NRHP and is not known to possess exceptional significance based on its architecture or association with significant events or persons, this building does not appear to be potentially eligible for the NRHP.

Between 1994 and 1997, TANG constructed the open storage shed currently known as Building 2860. Since this building does not exceed the fifty-year threshold for eligibility for the NRHP and does not appear to be significant based on its architecture or association with significant events or persons, this building does not appear to be potentially eligible for the NRHP.

TANG constructed the building currently known as Building 2854 between 1997 and 2003. The original function of the building is unknown, but its prefabricated metal frame and metal wall and roof panels suggest a utilitarian function. Since this building does not exceed the fifty-year threshold for eligibility for the NRHP and does not appear to be significant based on its architecture or association with significant events or persons, this building does not appear to be potentially eligible for the NRHP.

It is the opinion of the consultants that the eleven buildings constructed by TANG do not appear to be potentially eligible for listing in the National Register of Historic Places and did not merit further evaluation for NRHP eligibility for the following reasons. The structures did not

meet the 50 year age requirement for eligibility, are not architecturally significant, and do not possess exceptional historical significance that would make the buildings potentially eligible under Criteria Consideration G.

FEDEX BUILDINGS

History

FedEx was founded as the Federal Express Corporation in June of 1971 in Little Rock, Arkansas. Efforts to secure an area capable of supporting air cargo operations on the scale Smith envisioned were sought out, and ultimately the site of the former Memphis Army Airfield and Tennessee Air National Guard facilities (TANG) proved suitable to serve as the base of operations for the young startup company. As a result, founder and CEO, Fred Smith, decided to relocate Federal Express Corp. to his hometown, Memphis, Tennessee, shortly after its inception, and officially commenced operations on April 17, 1973.

Federal Express began renovations and modifications of the former Memphis Army Airfield and Tennessee Air National Guard facilities (TANG) in order to accommodate the swift expansion of the air cargo operations of the company. These building alterations marked the first time structures associated with the air field, and TANG facilities were modified to serve different functions. In support of the growing business and expansion of shipping services in 1975, Federal Express installed the first shipment drop boxes for customers in a series of strategically placed locations facilitating a new means of package drop ship that did not require customers to go to a Federal Express office in order to ship packages. During this time, Federal Express also successfully lobbied the U.S. Congress, which led to the passing of Public Law 95-163 in 1977 by the 95th U.S. Congress. This legislation amended the Federal Aviation Act of 1958 and paved the way for cargo airlines, including Federal Express, to employ the use of larger aircraft, ushering in the purchase and introduction to the FedEx fleet of seven Boeing 727 aircraft each capable of carrying 40,000 pounds of cargo.

In 1978, Federal Express became a publically traded company and was listed on the New York Stock Exchange with the ticker symbol FDX. Between 1980 and 1981, Federal Express expanded operations and opened the air cargo facility known as the SuperHub near the Memphis International Airport. Another revolutionary achievement came in the form of FedEx's development and integration of computer-based systems to support shipment automation between 1979-1984. The development of COSMOS (Customer, Operations, and Services Master Online System), DADS (Digitally Assisted Dispatch System), and PowerShip® (The first PC-based automated shipping system ever developed) were integral advancements propelling the growth of FedEx and advancing the company into the digital age at an early stage.

By 1983, FedEx became the first company in the U.S. to attain $1 billion in revenue while barring any mergers and acquisitions within the first decade of formation. During the early 1980s, Federal Express also expanded operations internationally, beginning delivery to Canada, Asia, and throughout the Pacific. In 1994, Federal Express officially launched the brand "FedEx" and through the duration of the 1990s made significant advancements to its digital tracking

processes and online presence, enabling service to customers through the Internet via fedex.com.

In 1998, FedEx formed FDX Corp. after acquisition of Caliber Systems, Inc. and transformed into a mega transportation conglomerate valued at upwards of $16 billion, expanding operations in the ground freight and less-than-truckload (LTL) transportation and cargo delivery sectors. FedEx rounded out the decade of the 1990s by adding a hub in Paris, France and expanding operations in Europe. By 2000, FedEx underwent a name change from FDX to FedEx Corporation and subsidiary companies were formed and designated according to purpose, such as FedEx Express, FedEx Ground, FedEx Global Logistics, FedEx Custom Critical, and FedEx Services to operate independently of each other while serving a collective goal in the shipping and cargo industry.

FedEx Express entered into a cooperating public-private sole source contract agreement with the U.S. Postal Service in 2001 servicing conveyance of all Priority Mail and Express Mail. In 2007, the U.S. Postal Service extended the initial contract through 2013. Subsequently FedEx won a second contract to continue services through 2020, which was extended again through 2024. This currently makes the U.S. Postal Service the largest customer of FedEx Express.

During the first decade of the millennium (2000-2010), FedEx continued to grow and expand business and operations in the ground freight and international air cargo sectors, as well as adopting energy efficient green policies, including the introduction of hybrid-electric trucks in 2003, and all-electric trucks in 2010 for U.S. parcel delivery service. In 2004, FedEx Corp. acquired Kinko's, giving FedEx new access to all 1,200 extant retail locations and providing customers with additional conveniences in parcel shipment.

In 2008, FedEx continued to expand its air cargo fleet with the addition of Boeing 757 aircraft, also setting records as the first devoted U.S. air cargo carrier to add the world's largest cargo aircraft with twin-engines, the Boeing 777, to its fleet. Additionally in 2013, FedEx added the Boeing 767-300 Freighter aircraft to its fleet, enhancing delivery capabilities domestically while reducing fuel costs and supporting energy efficiency. FedEx currently has a significant variety of aircraft that carry out air operations in its fleet in addition to these larger series planes, including Airbus A300, McDonnell DC10, Boeing 727, and smaller aircraft like the Cessna 208.

From 2010 to the present FedEx has expanded its international operations and made significant advancements in shipping, e-commerce and business technology, laboratory testing of package shipments through FedEx TechConnect (2013), as well as domestic and international company acquisitions including TNT Express (2016), GENCO (2015), Bongo International (2014), Opek Sp.z o.o. (2012), Rapidão Cometa (2011), allowing FedEx to forever alter the way goods are shipped and e-commerce services are provided globally. Over the last four decades, FedEx has revolutionized the way cargo moves throughout the world.[24]

[24] "Time Flies: The FedEx Timeline," FedEx, accessed June 20, 2016, http://about.van.fedex.com/our-story/history-timeline/timeline/.

Architectural Description

Eighteen of the structures included in this survey were used or constructed by FedEx during their occupancy of the project area south of Democrat Road. Hangar No. 6, Hangar No. 7, the Boiler Room, the Paint Shop, and the North Secondary Sort 1-4 were assumed from TANG following the relocation of FedEx to the Memphis International Airport in 1973. The Southwide Center buildings were gradually incorporated into the FedEx facility beginning in the late 1970s, with a plan for the use of all seven of the structures by the mid 1980s. FedEx built three of the buildings for company operations, including the Administration Building (2861), the GSE Maintenance Building (3099), and the GSE Hydrogen Test Facility (2884). The remaining buildings were assumed from TANG following the land transfer with the Memphis Airport Authority in 2004.

The first buildings to be used and altered by FedEx within the project area include Hangar No. 6, Hangar No. 7, the Boiler Room, and the Paint Shop. The most significant alterations to these buildings correspond to the period of use by the FedEx Corporation from 1973 to 1991. When FedEx relocated to Memphis in 1973, the company immediately initiated the design and construction on a new Administration Building, which connected to the northeast corner of Hangar No. 7 (2837) and the northwest corner of Hangar No. 6 (2879). They also completed an extensive renovation of Hangar No. 6 (2879) including the construction of a two-story concrete block office building oriented north to south through the center of the hangar (Figure 14). The construction drawings for these modifications were dated February 1973, with revisions extending through October 1977. While Hangar No. 6 (2879) and the new Administrative Building would ultimately house most administrative activities, the active construction projects in these two buildings made Hangar No. 7 (2837) the primary office facility for the first two years that FedEx was operating in Memphis. In addition to the alterations made to the interior of Hangar No. 6 (2879), alterations were made to the exterior of all three hangars (Figures 15 and 16). While these modifications altered the appearance of these structures from the exterior, an assessment of the interior revealed that they were additive and reversible in nature. The removal of these elements would expose a majority of the character defining features of these structures. The Boiler Room seems to have been almost entirely unaltered by FedEx during their use of the structure, with the exception of upgrades and replacement of selected mechanical equipment installed in this facility. In contrast, the utilitarian wood building known as the Paint Shop has been heavily altered, which has obscured its original use.

The first building constructed by FedEx at the Memphis International Airport was the Administration Building (2861) (Figures 17 and 18), which the company commissioned Menzer/Lindy & Associates to design in 1972 to serve as the first purpose built corporate headquarters. The construction drawings for these modifications were dated February 1973. Although revision dates extend through October 1977, the majority of drawing revisions occurred by October 1974. This building remained in active use by FedEx through the construction of the FedEx Express World Headquarters in 2004. At that time, the company consolidated most administrative functions into the current corporate campus located at 3680 Hacks Cross Road in Memphis, Tennessee.

As constructed in the early 1970s, the Administration Building was a three-story brick building with upper floors that cantilevered over the main level on both the north and south facades. The horizontal proportions of the building were accentuated by bands of curtain wall that extended along the entire length of the each floor level of the primary facades. The glass filled north and south facades contrasted with the east and west facades, which were composed entirely of brick. The primary entrance was located at the center of the north façade and led to a central stair tower and a longitudinal corridor on each level (Figure 19). The main level of the building housed computer rooms and a flight administration area. The second floor was primarily composed of large open work areas. The use of the third floor was divided with open work areas in the east side of the building and executive office space and conference rooms (Figures 26 and 27) in the west side of the building was constructed on a concrete slab with walls composed of a combination of curtain walls and concrete masonry units with a brick veneer. Each floor level was constructed of concrete slabs supported by steel beams and bar joists. The roof was constructed of a metal roof deck supported by steel bar joists.

In 1987, FedEx hired architect Paul D. Gillespie of Memphis, Tennessee to add onto the building, substantially altering the floor plan of each level and the appearance of the north façade of the structure (Figures 20 and 21). The three-story addition required the demolition of the original façade and the addition of two rows of offices along a longitudinal corridor that extended the entire length of the north façade (Figures 22 and 23). The resulting north façade is similar to the original south façade, with the exception of the use of narrower bands of curtain wall along each level, reducing the amount of glass on this façade and increasing the masonry mass. This addition was also constructed on a concrete slab with walls composed of a combination of curtain walls and concrete masonry units with a brick veneer. Each floor level was constructed of concrete slabs supported by steel beams and bar joists. The roof was constructed of a metal roof deck supported by steel bar joists.

This alteration was followed by the design and construction of a single-story security screening area in 1988 abutting the east facade of the previous addition and the north façade of Hangar No. 6 (Figures 21, 24, and 25). The north and east façades of this addition were composed of curtain walls and concrete masonry units with brick veneer. The other construction details for this addition conformed to the detailing of the previous addition.

Although the Administration Building does not meet the requirements of the fifty-year threshold for eligibility for the National Register of Historic Places, it is the opinion of the consultants that the Administration Building retains a high level of integrity in association with the early years of FedEx operations in Memphis and the development of air cargo transportation. Therefore, it is the opinion of the consultants that these structures are potentially eligible for listing in the National Register of Historic Places based on Criterion A under Criteria Consideration G. This recommendation is based on the association of this building with the exponential growth of FedEx and its influence on local and national economies, as well as international business.

The second building constructed by FedEx in the current project area was the GSE Maintenance Building (3099), which was constructed between 1980 and 1981 as a maintenance facility for ground support equipment and operations. It is a metal frame structure clad with metal wall and roof panels. Since this building does not exceed the fifty-year threshold for eligibility for the NRHP and is not known to be significant based on its architecture or association with significant events or persons, this building does not appear to be potentially eligible for the NRHP.

The final structure built by FedEx in the current project area was the GSE Hydrogen Test Facility (2884) in coordination with the U.S. Department of Energy Fuel Cell Technologies Office (FCTO), Plug Power, Inc. and CharlatteAmerica. The property is designed and constructed to support the world's first zero emissions, hydrogen fuel cell-powered ground support equipment (GSE). In this partnership, the U.S. Department of Energy awarded FedEx a $2.5 million matching funds grant to explore the use of clean energy in the transportation sector.[25] CharlatteAmerica constructed the fifteen hydrogen fuel cell-powered GSEs, and Plug Power constructed the supporting hydrogen fuel cells that were integrated into the CharlatteAmerica GSEs and the GSE Hydrogen Test Facility. This facility is one of the first of this type in the nation and is the first for use in airport GSE. The initiative commenced on April 9, 2015 and was expected to last two years.[26]

The GSE Hydrogen Test Facility contains hydrogen storage, transmission, and pumping equipment. It is bounded on the west by Southwide Drive and on the north, east, and west sides by the concrete slab that underlies the facility. The equipment installed in this location consists of a vertical storage tank, two hydrogen fuel pumps, and associated equipment and piping. The two hydrogen fuel pumps are located south of the hydrogen storage tank. The concrete slab is surrounded by a row of protective bollards on all sides. There are horizontal panels that connect the bollards on the west and the western portion of the north and south sides of the facility. The pumps are located in line with the bollards and horizontal panels so that they are accessible to vehicular traffic on Southwide Drive.

The GSE Hydrogen Test Facility (2884) was initially considered potentially eligible for the NRHP under Criteria Consideration G, which addresses properties that have achieved significance within the past fifty years. Although this property was constructed in 2014, it was designed to fuel the world's first hydrogen cell-powered ground support vehicles. It has not been altered from its original configuration and retains an exceptionally high level of integrity. For this reason, additional research was conducted on this property to provide the information necessary to determine its eligibility based on its early implementation of alternative fuel

[25] U.S. Department of Energy. "World's First Fuel Cell Cargo Trucks Deployed at U.S. Airport." Accessed June 2, 2016. http://energy.gov/eere/articles/worlds-first-fuel-cell-cargo-trucks-deployed-us-airport.

[26] FedEx "FedEx Works with US DOE, PlugPower Inc. & CharlatteAmerica to Rollout World's First Zero Emissions, Hydrogen Fuel Cell Ground Support Equipment." Accessed June 2, 2016. http://about.van.fedex.com/newsroom/global-english/fedex-works-with-us-doe-plugpower-inc-charlatteamerica-to-rollout-worlds-first-zero-emissions-hydrogen-fuel-cell-ground-support-equipment/.

systems in air transportation and air cargo services. Due to preliminary consultation with FAA and the TN-SHPO, the consultants have not recommended this property as potentially eligible under Criteria Consideration G due to the temporary nature of its use.

DETERMINATION OF ELIGIBILITY

WORLD WAR II MILITARY AIRCRAFT HANGARS AND BOILER ROOM

Evaluation of Criterion A

Properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history. The World War II military aircraft hangars and associated Boiler Room were constructed as a part of the exponential expansion and transition of the U.S. Army Air Corps into the U.S. Army Air Forces during the war, which paved the way for the establishment of the U.S. Air Force as an independent branch of the armed forces following World War II. Within the context of the development of American air power, the Memphis Army Air Field was likely on the forefront of this growth in the 54-Group Plan established in late 1940, when the AAC used existing civil air fields to expedite the construction of tactical fields. This would place the Memphis Army Air Field among a group of approximately 400 tactical fields nationwide that were intended to be operational as quickly as possible in order to protect the home front. Given the significance of aircraft hangars to the operations of a military air field, Hangar No. 6, Hangar No. 7, and the associated Boiler Room are closely associated with the historic context and representative of the significant role of these structures on the home front during World War II. Due to the association of these structures with World War II aviation, it is the opinion of the consultants that the Hangar No. 6, Hangar No. 7, and the Boiler Room are potentially eligible for the National Register of Historic Places as a district based on Criterion A.

Assessment of Integrity under Criterion C

Element of Integrity	Level of Integrity	Assessment
Location	High	Hangar No. 6, Hangar No. 7, and the Boiler Room remain in their originally constructed locations. These locations remain associated with aviation operations.
Design	High	The character defining features of the hangars remain intact. These include the asymmetrical plan, wood bow truss roof structure, single-laced wood truss columns along the north and south walls of the hangar bays, and 120 double-hung windows that dominate each of the south facades. The alterations to the exteriors include the installation of metal wall panels over the

		original wood siding and windows, which are potentially reversible in nature. The Boiler Room, which served the two existing hangars and a third hangar that was demolished between 1994 and 1997, retains its original design, jalousie windows, and historic mechanical systems. No additions have been made to the structure.
Setting	Medium	Hangar No. 6, Hangar No. 7, and the Boiler Room remain on the same parcel as the Memphis Air Field. The surrounding area has been developed and modernized to account for modern military and commercial air cargo operations. The development on this parcel remains in use as an aviation support facility.
Materials	High	The original materials used to construct the character defining features of Hangar No. 6 and Hangar No. 7 are relatively intact, including the original wood roof and wall framing, wood siding, wood windows, metal clad hangar doors and hardware, and some mechanical systems. These materials contribute substantially to the integrity and significance of these structures, as only 2% of the historic military aircraft hangars in the possession of the Department of Defense (DoD) in 1998 were constructed of wood. When considering the hangars constructed with a wood bowstring truss, there were only seventeen in existence in 1998 in the nation. These numbers have since declined, resulting in only eleven known extant structures remaining in the U.S. as of 2016. The relative rarity of wood frame construction in extant World War II era military aircraft hangars contribute substantially to the significance of these buildings. The Boiler Room, with its concrete masonry unit (CMU) walls, metal trusses and purlins, metal roof panels, and jalousie windows, has not been altered. Nearly all original materials remain intact with the exception of those affected by regular maintenance.
Workmanship	Medium	The unique, asymmetrical design of Hangar No. 6 and Hangar No. 7 demonstrates a high level of workmanship by the unknown architect or engineer. Their anonymity does not diminish the significance of the unique modifications made to standard designs of the era to construct the hangars at the Memphis Air Field. The designer relocated the multi-story office and storage blocks, typically used to support and

		buttress both ends of the bow truss in standard designs, doubling the width of the office and storage block on the north side of the hangars and allowing the installation of 120 double-hung windows on the south façade that increased ambient lighting in the hangar bays. This also altered the sliding hangar doors, which then opened north into a recess at the end of the office and storage block. The Boiler Room demonstrates a high level of workmanship in the design and construction of original mechanical systems that remain in place.
Feeling	Medium	The appearance of the exteriors of Hangar No. 6 and Hangar No. 7 are iconic and easily identifiable as aircraft hangars, which contribute to the feeling and identity of the area as an aviation support facility. The exposed original materials on the interiors also contribute to the perception of their original use as aircraft hangars. This feeling is further enhanced by the continued use of the hangar bays in support of aviation operations. The partial subdivision of the hangar bay in Hangar No. 6 with a concrete masonry unit office block diminishes, but does not obscure, the original proportions of this character defining interior space. The feeling invoked by the Boiler Room is consistent with its utilitarian nature and is supported by the intact mechanical systems installed in the building and the tunnels accessing the adjacent hangars. The buildings retain a high level of original design features, which contribute to the feeling of a military air field.
Association	High	Hangar No. 6, Hangar No. 7, and the Boiler Room are closely associated with the historic context of World War II era sites in Tennessee and the nation's wartime aviation history and remain clear representations of the significant role of these structures on the home front during World War II.

Statement of Significance

It is the opinion of the consultants that Hangar No. 6, Hangar No. 7, and the Boiler Room retain a significant level of integrity. Therefore, it is the opinion of the consultants that these structures are potentially eligible for listing in the National Register of Historic Places under Criterion A. This opinion is based on their association with the exponential expansion and transition of the U.S. Army Air Corps into the U.S. Army Air Forces during World War II, which paved the way for the establishment of the U.S. Air Force as an independent branch of the armed forces following the war, as well as the representation of the domestic war effort. In

addition, it is the opinion of the consultants that these structures are potentially eligible for listing under Criterion C due to their unique, asymmetrical design and the rarity of extant wood bow truss hangars in the nation.

The proposed National Register Boundary for the World War II era properties includes the footprint of Hangar No. 6, Hangar No. 7, and the Boiler Room, as well as the portion of Sprankel Avenue separating the Boiler Room from the hangars, because it overlies the utility corridor used to connect these structures. The area defined by this boundary contains approximately 3.85 acres. The proposed boundary does not include the FedEx Administration Building, which is assessed for eligibility in the following section (Figure 28).

FEDEX ADMINISTRATION BUILDING AND ADAPTIVE REUSE OF WORLD WAR II ERA BUILDINGS

Evaluation of Criterion A, under Criteria Consideration G

Properties can be eligible for the National Register if they are associated with events that have made a significant contribution to the broad patterns of our history. The FedEx Administration Building was constructed as the first purpose built corporate headquarters for the company and was initiated at the time that the company relocated from Little Rock, Arkansas to Memphis, Tennessee in 1973. The construction of the building connected Hangar No. 6 and Hangar No. 7, creating a mixed-use operations facility that incorporated administrative functions, flight crew quarters, flight management operations, and aircraft and ground support equipment maintenance. This facility utilized new construction and adaptive reuse of existing World War II era structures to support operations for the young startup company, forming the core of FedEx's early business operations in Memphis. Given the exponential growth of FedEx and its impact on local and national economies, as well as international business, the company has forever influenced air cargo operations, parcel shipments, and the way in which e-commerce services are provided globally. The exceptional importance of the facility is demonstrated by the fact that there are no other known properties representative of early FedEx operations in the community, state, or nation. Due to the association of these structures with the early history of FedEx, it is the opinion of the consultants that the Administration Building, Hangar No. 6, Hangar No. 7, and the Boiler Room are potentially eligible for the National Register of Historic Places as a district based on Criterion A under Criteria Consideration G.

Assessment of Integrity under Criterion A

Element of Integrity	Level of Integrity	Assessment
Location	High	The Administration Building, Hangar No. 6, Hangar No. 7, and the Boiler Room remain in their originally constructed locations. These locations are consistent with those in place during the early years of FedEx operations in Memphis.
Design	Medium	The character defining features of the original Administration Building as constructed in 1973 have been altered. The original north façade was demolished and replaced with the construction of a three-story addition in 1987, which was detailed in similar manner to the original design of the south façade. In 1988, a second alteration occurred with the addition of a single-story security screening area at the east end of the previous addition to the north façade. Due to the adaptive reuse of the World War II era buildings, there were several interior alterations to Hangar No. 6 and Hangar No. 7. These are limited to the alteration of partition walls in the office and storage blocks and the construction of a two-story concrete masonry unit (CMU) office block in the hangar bay of Hangar No. 6. Exterior alterations were limited to the installation of metal wall panels to the exterior of each of the hangars. The design of these buildings is consistent with the appearance of the structures during the early years of FedEx operations in Memphis.
Setting	Medium	The Administration Building, Hangar No. 6, Hangar No. 7, and the Boiler Room remain on the same parcel as the Memphis International Airport when FedEx relocated to Memphis in 1973. Although the surrounding area has been further developed and modernized to account for modern military and commercial air cargo operations, the development is consistent with the use of this area as an aviation support facility during the early years of FedEx operations in Memphis.
Materials	High	All exterior materials related to the condition of the buildings circa 1988 remain intact, including the brick veneer and curtain

		walls and metal wall panels. The plan of the interiors has been altered over the last three decades, but the exterior is consistent with the appearance of the structures during the early years of FedEx operations in Memphis.
Workmanship	Medium	The workmanship of the Administration Building and the alterations to Hangar No. 6 and Hangar No. 7 is consistent with the technology, aesthetics, and construction practices prevalent during the period associated with the early years of FedEx operations in Memphis.
Feeling	Medium	The continuity in the use and design of the Administration Building, Hangar No. 6, Hangar No. 7, and the Boiler Room expresses a feeling of early FedEx operations in Memphis. The retention of the historic design and setting also contributes to the feeling of early FedEx operations at this facility.
Association	High	The FedEx Administration Building and alterations to Hangar No. 6 and Hangar No. 7 were constructed as the first corporate headquarters and operations facility for the company. The importance of FedEx and its impact on local and national economies, as well as the changes that the company has made to global air cargo operations, parcel shipments, and e-commerce services. The exceptional importance of this property is due to its association with the historic trend in the development of air cargo transportation and the fact that there are no other known properties representative of early FedEx business operations in the community, state, or nation.

Statement of Significance

It is the opinion of the consultants that the corporate headquarters and operations facility created by the construction of the Administration Building connecting Hangar No. 6 and Hangar No. 7, and the associated Boiler Room retain a significant level of integrity in relation to the early years of FedEx operations in Memphis and the development of air cargo transportation. Therefore, it is the opinion of the consultants that these structures are potentially eligible for listing in the National Register of Historic Places as a district based on Criterion A under Criteria Consideration G. This recommendation is based on the association of these buildings with the exponential growth of FedEx and its impact on local and national economies, as well as international business. The exceptional importance of the property is demonstrated by the fact

that there are no other known properties representative of early FedEx operations in the community, state, or nation.

The proposed National Register District Boundary for the FedEx era properties contains approximately 4.3 acres. The district as defined by this boundary includes the footprint of the Administration Building, Hangar No. 6, Hangar No. 7, and the Boiler Room, as well as the portion of Sprankel Ave separating the Boiler Room from the hangars and Administration Building, because it overlies the utility corridor used to connect these structures (Figure 29).

DOCUMENTATION OF EFFECTS

The consultants applied the criteria of effect as found in 36 CFR Part 800.5 for the proposed project to the potentially eligible properties within the project area. There are two different potential eligibility determinations addressed in this survey. One includes only the World War II era buildings based on Criteria A and C. The other includes the buildings associated with early FedEx operations in the project area based on Criterion A under Criteria Consideration G. Since the footprints of each of these potential districts as defined in the previous section are nearly identical, this documentation of effects will address both districts in the same discussion. The proposed project as currently defined would require the demolition of the potentially eligible properties in the proposed Memphis Air Field historic district and the proposed FedEx historic district to enable the construction of a new Secondary Sort 25 facility. Because the proposed FedEx Transformations project would alter characteristics of the historic properties that qualify or render them potentially eligible for the National Register of Historic Places. It is the opinion of the consultants that the proposed project would have an adverse effect on the potentially eligible properties addressed in this historic resources survey.

Section 106

36 CFR Part 800.5 Assessment of Adverse Effects

(a) Apply Criteria of Adverse Effect

> *In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties, the Agency official shall apply the criteria of adverse effect to historic properties within the area of potential effects. The Agency Official shall consider any views concerning such effects, which have been provided by consulting parties and the public.*
>
> *(1) Criteria of Adverse Effect*
>
> > *An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or*

association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

(2) Examples of Adverse Effects

An undertaking is considered to have an Adverse Effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

The historic resources contained in the potential Memphis Air Field historic district are potentially eligible for listing in the National Register of Historic Places based on Criterion A due to their association with the historic context of World War II era sites in Tennessee and the nation's wartime aviation history and remain clear representations of the significant role of these structures on the home front during World War II. These resources are also potentially eligible under Criterion C due to their unique, asymmetrical design and the rarity of extant wood bow truss hangars in the United States. The historic resources contained in the potential FedEx historic district are potentially eligible for listing in the National Register based on Criterion A under Criteria Consideration G. This recommendation is based on the association of these properties with the exponential growth of FedEx and its impact on local and national economies, as well as international business. The exceptional importance of these properties is demonstrated by the fact that there are no other known properties representative of early FedEx operations in the community, state, or nation. Since the proposed project would result in the demolition of all historic properties in each of the potential districts, it is the opinion of the consultants that the proposed project would constitute an adverse effect to the historic properties.

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;

The proposed project would require the demolition of the historic properties in each of the proposed historic districts. Because the

proposed project would alter the historic properties in a way that is inconsistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties,* the proposed undertaking would constitute an adverse effect.

(iii) Removal of the property from its historic location

The proposed project would result in the removal of the property from its historic location through demolition and therefore the proposed undertaking would constitute an adverse effect.

(iv) Change of the character of the property's use or physical features within the property's setting that contribute to its historic significance;

The proposed project would result in significant alteration to the physical features and setting of properties within the APE through demolition, and therefore it is the opinion of the consultants that the proposed undertaking would constitute an adverse effect.

(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;

The proposed undertaking would result in the introduction of visual, atmospheric, or audible elements that would diminish the integrity of the property's significant features through the process of demolition. Therefore, it is the opinion of the consultants that the proposed undertaking would constitute an adverse effect to visual, atmospheric, or audible elements within the APE.

(vi) Neglect of a property which causes its deterioration, except where such neglect or deterioration are recognized qualities or a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

The proposed undertaking would not cause neglect and deterioration of the properties within the APE due to the process of demolition. Therefore, it is the opinion of the consultants that the proposed undertaking would not constitute an adverse effect related specifically to the neglect or deterioration of historic properties within the APE.

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The proposed undertaking would not result in the transfer, lease, or sale of the property or remove it from Federal control. Therefore, it is the opinion of the consultants that the proposed undertaking would not have an adverse effect related to ownership or control of the potentially eligible properties within the APE.

SECTION 4(F) DETERMINATION

FedEx initiated a project to update and modernize its facilities at the Memphis International Airport (MEM) in Memphis, Tennessee. The purpose and need of the project is to replace an obsolete package sorting facility with facilities specifically designed to accommodate modernized equipment compatible with their current aircraft fleet. After demolition of 23 of the buildings and removal of the associated slabs, FedEx would construct several new facilities and improve existing facilities in order to modernize equipment and improve efficiency. Once the Secondary 25 and Bulk Truck Load facilities and sort systems are fully operational, FedEx would deconstruct/demolish the final building down to slab level. This demolition of four Section 4(f) properties from within the proposed National Register Historic District bounded property constitutes a Section 4(f) "use" of an historic property. This type of use involves the permanent incorporation of the Section 4(f) resources as part of a transportation project. As a result, the proposed project will require a Section 4(f) evaluation.

CONCLUSIONS

FedEx, with approval by the Federal Aviation Administration (FAA), is proposing to deconstruct or demolish 24 structures and construct several new facilities at the Memphis International Airport in Memphis, Shelby County. The project area is located on the south side of Democrat Road along the northern boundary of the secure airport facility.

Pursuant to 36 CFR Part 800.4 and 23 CFR Part 774, cultural resource consultants completed an historical survey of the area of potential effect (APE) for the proposed FedEx Transformations project in 2016. The findings of this survey were presented in this report. The consultants identified three World War II era structures, which were constructed circa 1943. Although the two military aircraft hangars have been altered over time, particularly on the interior, it is the opinion of the consultants that they are potentially eligible for listing on the National Register of Historic places due to the unique design of these structures. The other World War II era structure is a freestanding Boiler Room that served the two existing hangars and a third hangar that was demolished between 1994 and 1997. The consultants also identified an office building constructed by FedEx in 1973 as the company's first purpose built headquarters. It is potentially eligible based on Criterion A under Criteria Consideration G, due to its association with the early history of FedEx. The 2016 survey did not identify any additional resources that were listed or potentially eligible for listing within the APE.

Pursuant to 26 CFR Part 800.5, the consultants applied the criteria of effect to the proposed undertaking. It is the opinion of the consultants that the project, as currently designed, would have an adverse effect on the World War II era structures and the FedEx Administration

Building. As a result, the consultants prepared a Section 4(f) evaluation per the requirements of the Department of Transportation Act of 1966, as amended. The specifications of the proposed project would constitute a use within the meaning of Section 4(f) due to the demolition of the 4(f) properties and the permanent incorporation of the site of these properties into the proposed Secondary 25 FedEx sort facility. Pursuant to 23 CFR Part 774.13(d)(5) of Section 4(f) of the U.S. Department of Transportation Act, when Section 4(f) resources are identified that will require permanent incorporation, the Official with Jurisdiction (OWJ) for the resource must be notified and concur in writing to the Section 4(f) use. When National Register listed or eligible properties are identified as Section 4(f) resources, the OWJ is the State Historic Preservation Officer. In order to document compliance with 23 CFR Part 774.13(d)(5), a written agreement is required for the project file showing that the OWJ concurs with the permanent incorporation of the Section 4(f) resource.

BIBLIOGRAPHY

Aaron, Jayne. Historical and Architectural Overview of Aircraft Hangars of the Reserves and National Guard Installations from World War I through the Cold War. Air Force Air Combat Command, 2011.

Air National Guard, "Unit History of the 164th Airlift Wing." http://www.164aw.ang.af.mil/Units/.

Airfields Database. "WW2 Military Airfields including Auxiliaries and Support fields New Jersey-Tennessee." Accessed June 20, 2016. http://www.airfieldsdatabase.com/ww2/WW2%20R27a%20NJ-TN.htm.

Army Corps of Engineers. Drawing No. N-17-310.3 showing A.T.C. Hangar, Birchwood Type, Elevation, Section and Details.

Brown, Jerold E. Where Eagles Land: Planning and Development of U.S. Army Airfields, 1910-1941. New York: Greenwood Press, 1990.

FedEx. Drawing No. 1, dated August 2, 1973, showing North Elevations of Hangar No. 6 (2879) and Hangar No. 7 (2837).

FedEx. Drawing No. 2, dated May 29, 1973, showing North Elevation of Hangar No. 8, East Elevations of Hangar No. 6 (2879) and Hangar No. 8, and West Elevations of Hangar No. 7 (2873) and Hangar No. 8.

FedEx. Drawing No. T250, dated August 13, 1973, showing Reflected Ceiling Plan and Building Section of Hangar No. 6 (2879).

FedEx "FedEx Works with US DOE, PlugPower Inc. & CharlatteAmerica to Rollout World's First Zero Emissions, Hydrogen Fuel Cell Ground Support Equipment." Accessed June 2, 2016. http://about.van.fedex.com/newsroom/global-english/fedex-works-with-us-doe-plugpower-inc-charlatteamerica-to-rollout-worlds-first-zero-emissions-hydrogen-fuel-cell-ground-support-equipment/.

FedEx. "Time Flies: The FedEx Timeline." Accessed June 20, 2016. http://about.van.fedex.com/our-story/history-timeline/timeline/.

Fly Memphis.com, "Airport History." http://www.flymemphis.com/Airport-History.

Futrell, Frank. "The Development of Base Facilities." In The Army Air Forces in World War II, vol. VI, edited by Wesley Frank Craven and James Lea Cate, 119-170. Chicago: The University of Chicago Press, 1983.

Historic Memphis, "Historic Memphis Airport… in Vintage Photos and Postcards". http://historic-memphis.com/memphis-historic/airport/airport.html.

Huey, Ben Meyer. “Problems for timber products procurement during World War II, 1941 to 1945,” Thesis, University of Montana, 1951.

Mueller, Robert. Air Force Bases: Active Air Force Bases within the U.S.A. on 17 September 1982. Washington, DC: Office of Air Force History, 1989.

Shetty, Kamala I. and R. John Hansman. Current and Historical Trends in General Aviation in the United States. Cambridge, Massachusetts: MIT International Center for Air Transportation, 2012.

Shorack, Ted. “Madras airport seeks listing for hangar: The building was used for B-17 planes in 1943.” Bend Bulletin, December 17, 2014. Accessed June 20, 2016. http://www.bendbulletin.com/slideShows? layout=2&storyId=2694949&currSlide=1.

U.S. Department of Energy. “World’s First Fuel Cell Cargo Trucks Deployed at U.S. Airport.” Accessed June 2, 2016. http://energy.gov/eere/articles/worlds-first-fuel-cell-cargo-trucks-deployed-us-airport.

Webster, Julie L. and Gordon L. Cohen. “Military Aircraft Hangars: Footprints through a Century of Flight.” CRM Vol. 24, No. 3 (2001): 29-31.

Webster, Julie L. Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations. Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999.

Yenne, Bill. The History of the U.S. Air Force. New York: Exeter Books, 1984.

FIGURES

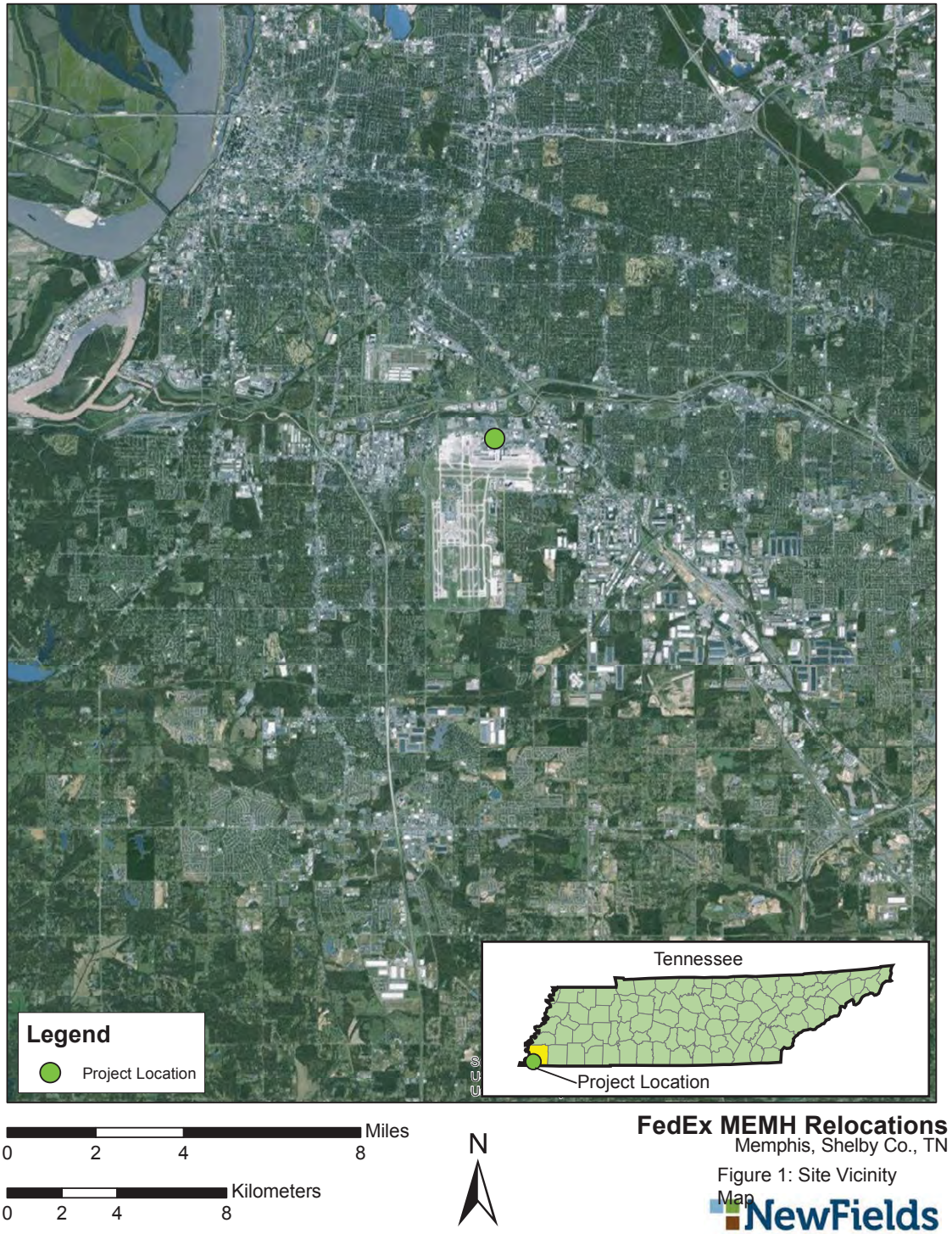


Figure 1: Site Vicinity Map.

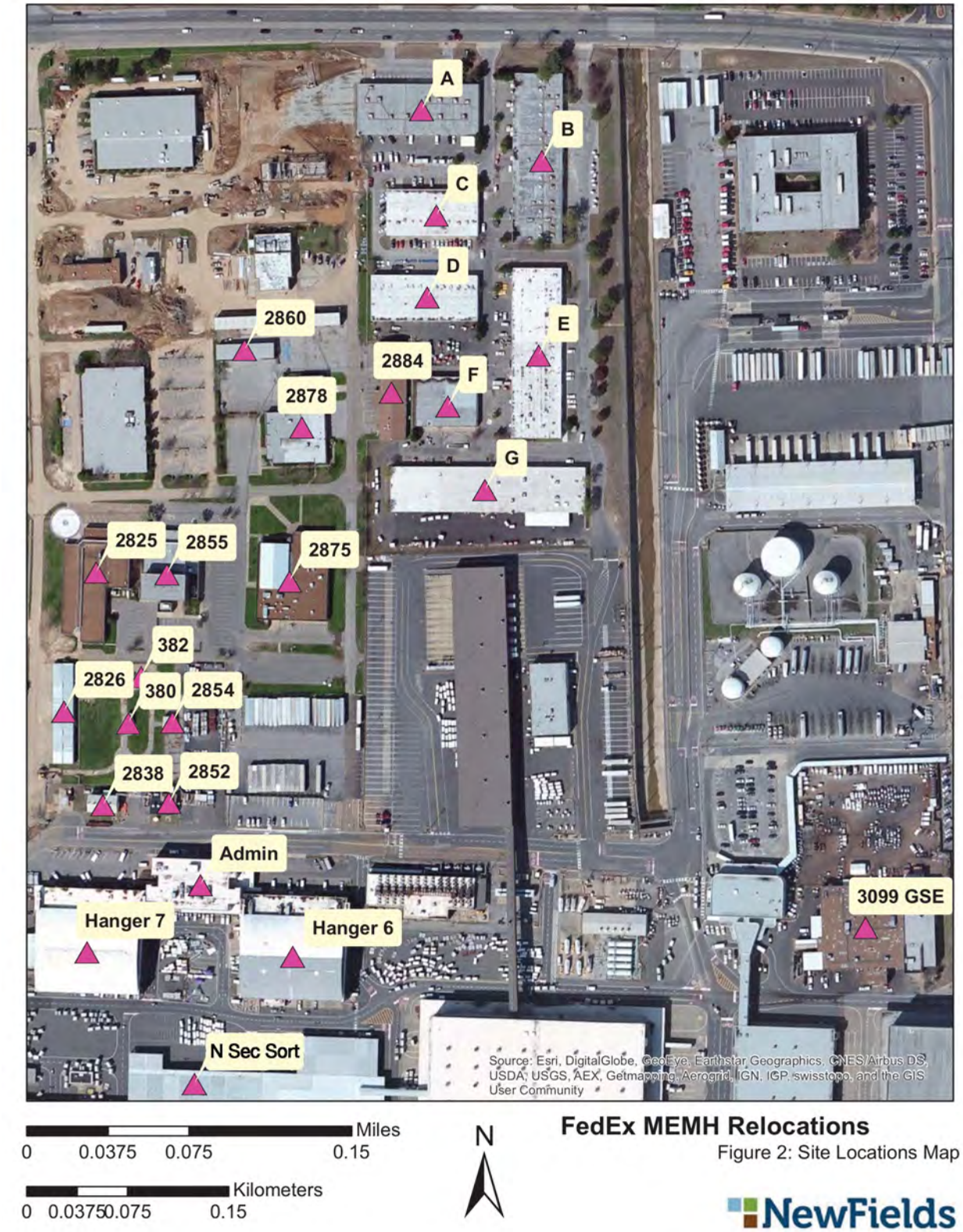


Figure 2: Site Locations Map.

Figure 3: TN-SHPO survey map and aerial view depicting the locations of three properties identified by TDOT historians. The two circa 1950 single-family residences are indicated in green and the 1958 commercial building east if the airport is indicated in yellow.

Figure 4: National Register of Historic Places Map.

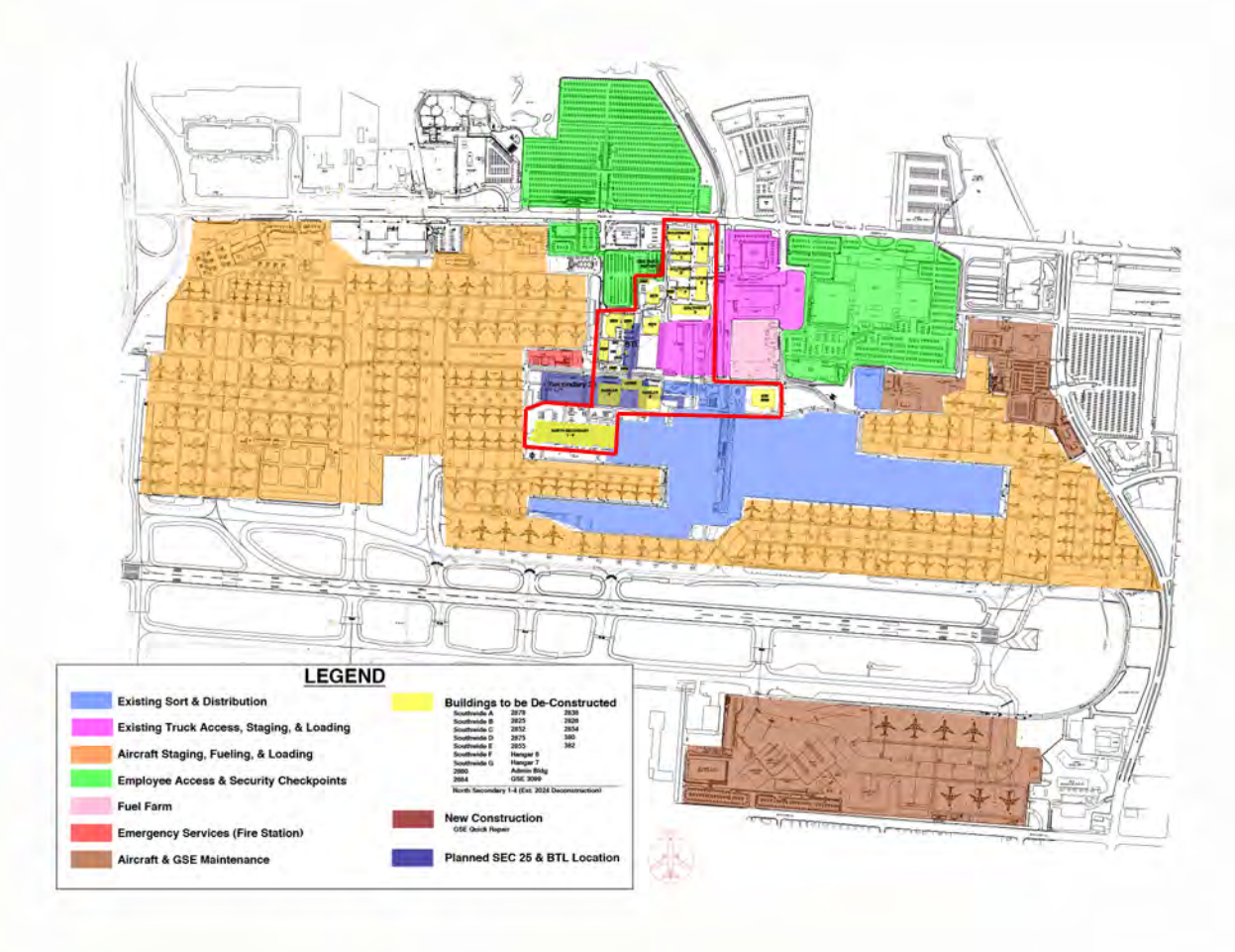


Figure 5: FedEx Ramp Plan depicting the location and boundary of the APE.

Figure 6: Exterior of Hangar No. 7 (2837) showing west and south facades.

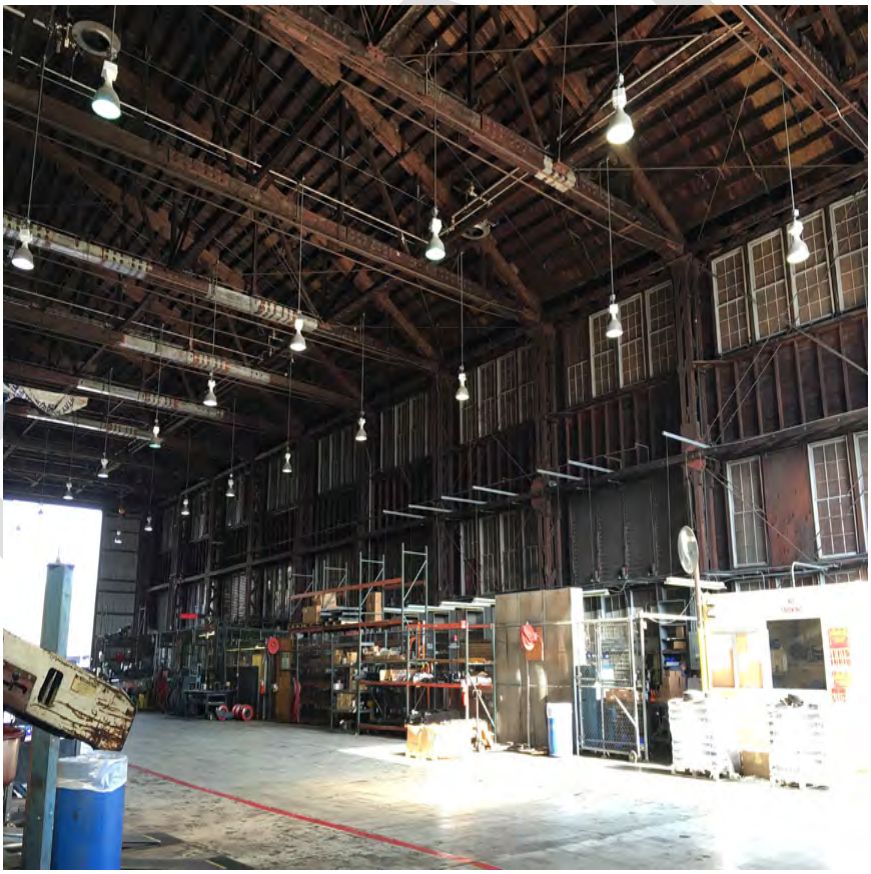


Figure 7: Interior of Hangar No. 7 (2837) showing the south wall and the southern portion of the east wall.

Figure 8: Exterior of Boiler Room (2838) showing south and west facades.

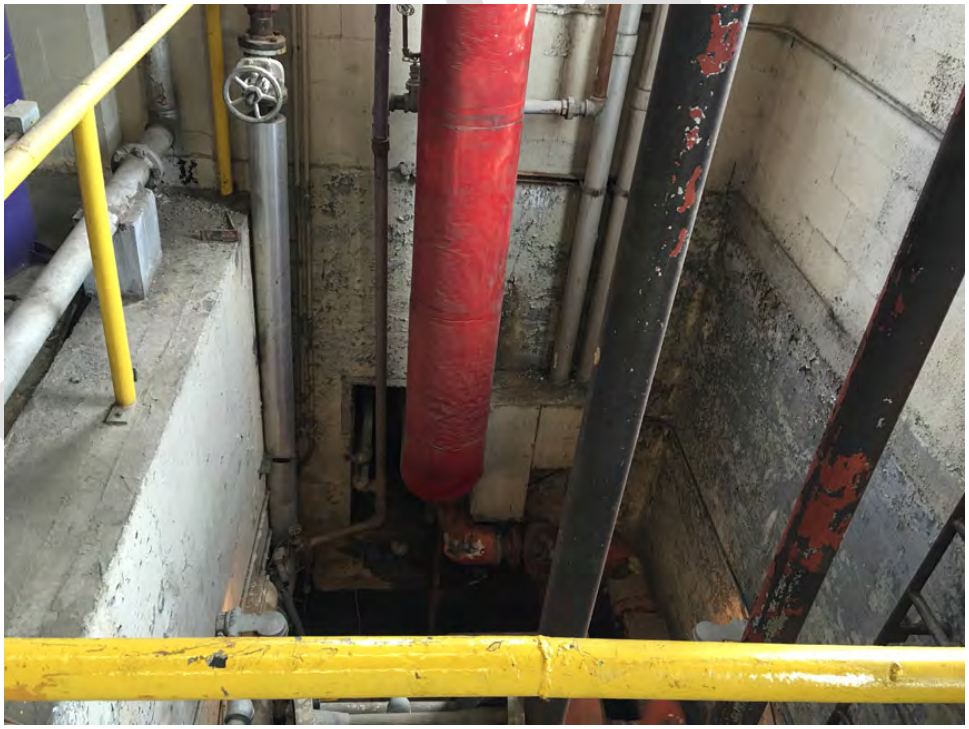


Figure 9: Interior of Boiler Room (2838) showing entrance to underground utility corridor leading to Hangar No. 7 (2837).

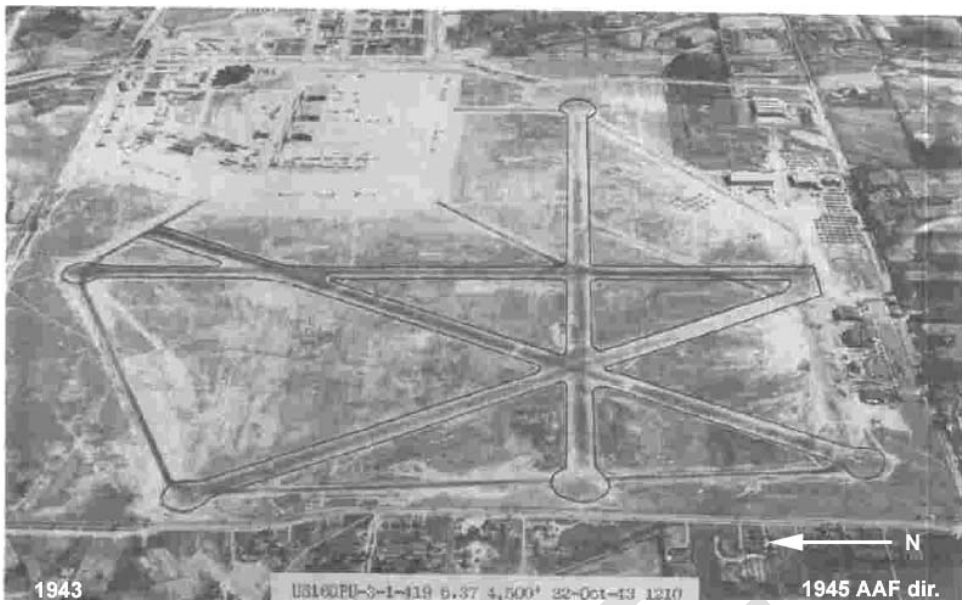


Figure 10: Aerial image of Memphis Army Air Field toward the east. Photograph taken on October 22, 1943.[27]

Figure 11: Interior of OBH-2 Hangar in Madras, Oregon showing wall framing system.[28]

[27] "WW2 Military Airfields including Auxiliaries and Support fields New Jersey-Tennessee," Airfields Database, accessed June 20, 2016, http://www.airfieldsdatabase.com/ww2/WW2%20R27a%20NJ-TN.htm.

[28] Ted Shorack, "Madras airport seeks listing for hangar: The building was used for B-17 planes in 1943,"

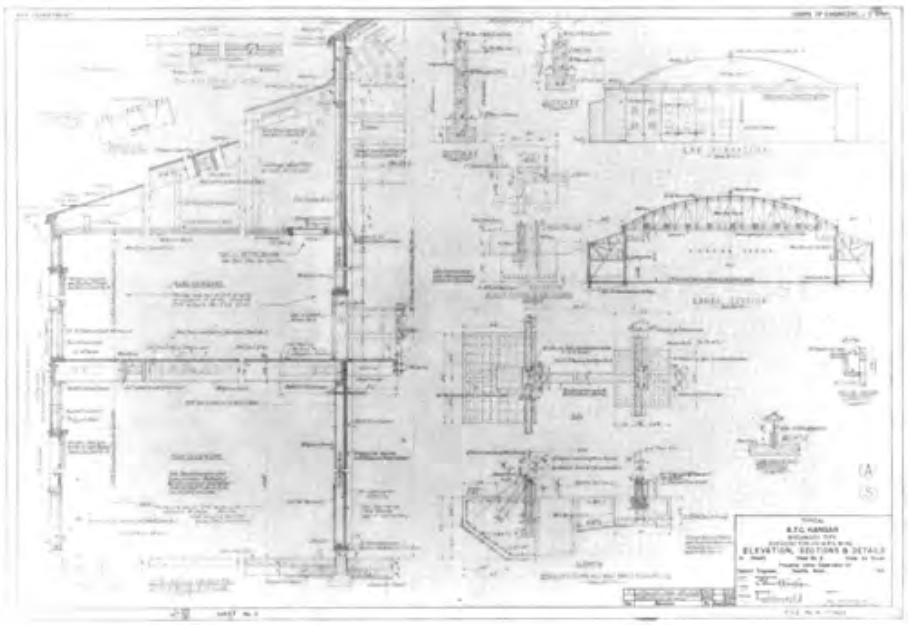


Figure 12: Drawing No. N-17-310.3 showing A.T.C. Hangar Birchwood Type, Elevation, Section and Details.[29]

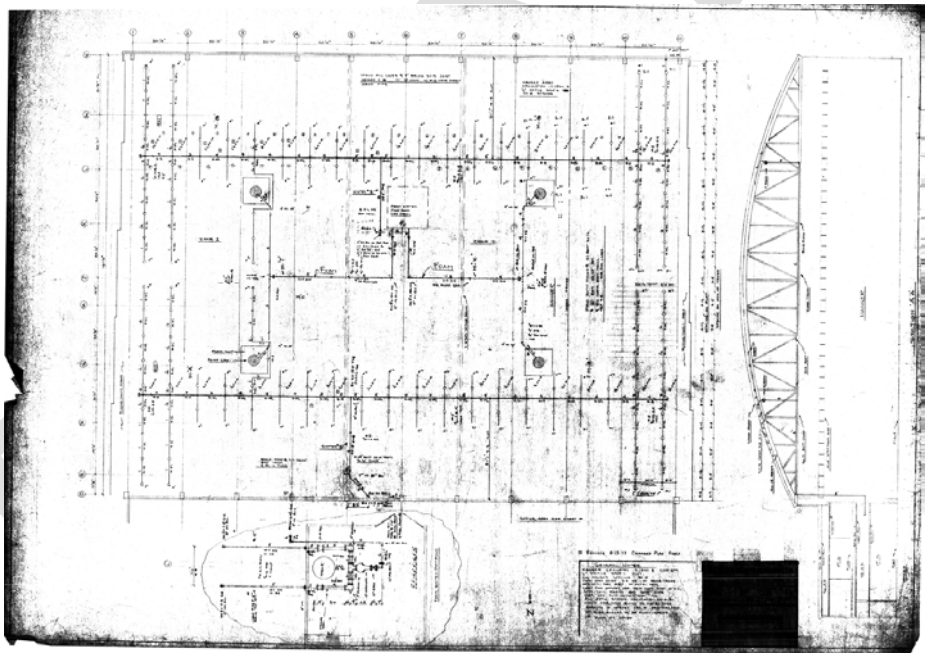


Figure 13: Drawing No. T250, dated August 13, 1973, showing Reflected Ceiling Plan and Building Section of Hangar No. 6 (2879).[30]

Bend Bulletin, December 17, 2014, accessed June 20, 2016, http://www.bendbulletin.com/slideShows?layout=2&storyId=2694949&currSlide=1.

[29] Army Corps of Engineers, Drawing No. N-17-310.3 showing A.T.C. Hangar, Birchwood Type, Elevation, Section and Details.

Figure 14: Interior of west half of Hangar No. 6 toward northeast showing concrete block office block dividing the original hangar space.

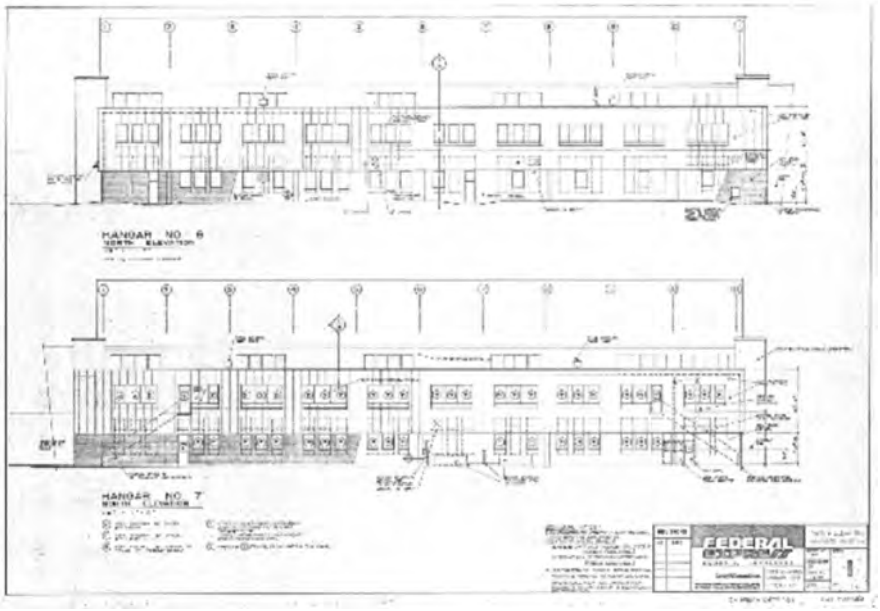


Figure 15: Drawing No. 1, dated August 2, 1973, showing North Elevations of Hangar No. 6 (2879) and Hangar No. 7 (2837).[31]

[30] FedEx, Drawing No. T250, dated August 13, 1973, showing Reflected Ceiling Plan and Building Section of Hangar No. 6 (2879).

[31] FedEx, Drawing No. 1, dated August 2, 1973, showing North Elevations of Hangar No. 6 (2879) and

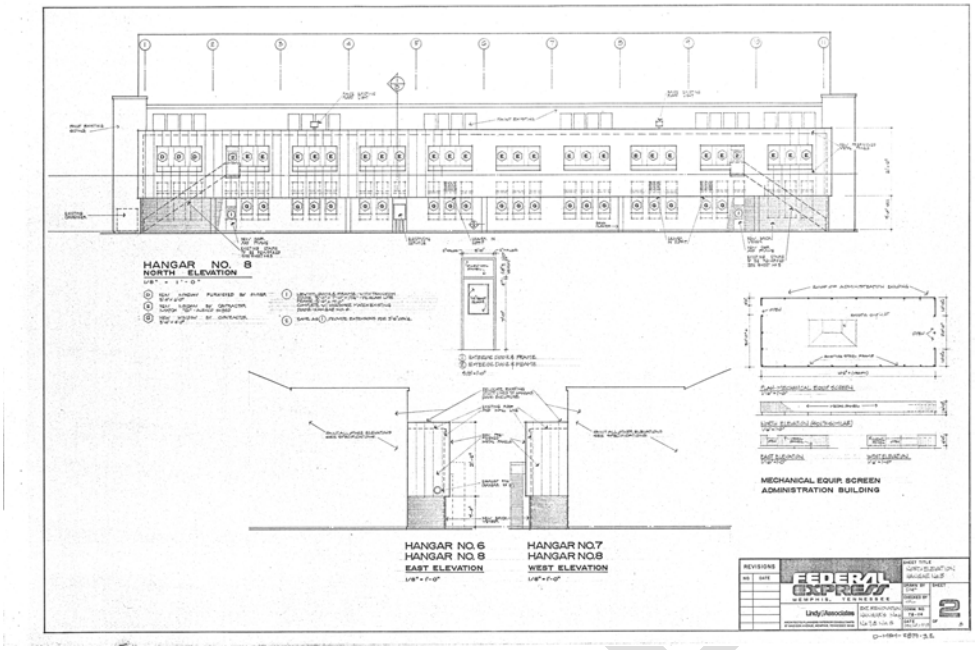


Figure 16: Drawing No. 2, dated May 29, 1973, showing North Elevation of Hangar No. 8, East Elevations of Hangar No. 6 (2879) and Hangar No. 8, and West Elevations of Hangar No. 7 (2873).

Figure 17: North Façade of Administration Building (2861) circa 1973.

Hangar No. 7 (2837).

Figure 18: South Façade of Administration Building (2861) showing original façade, circa 1973.

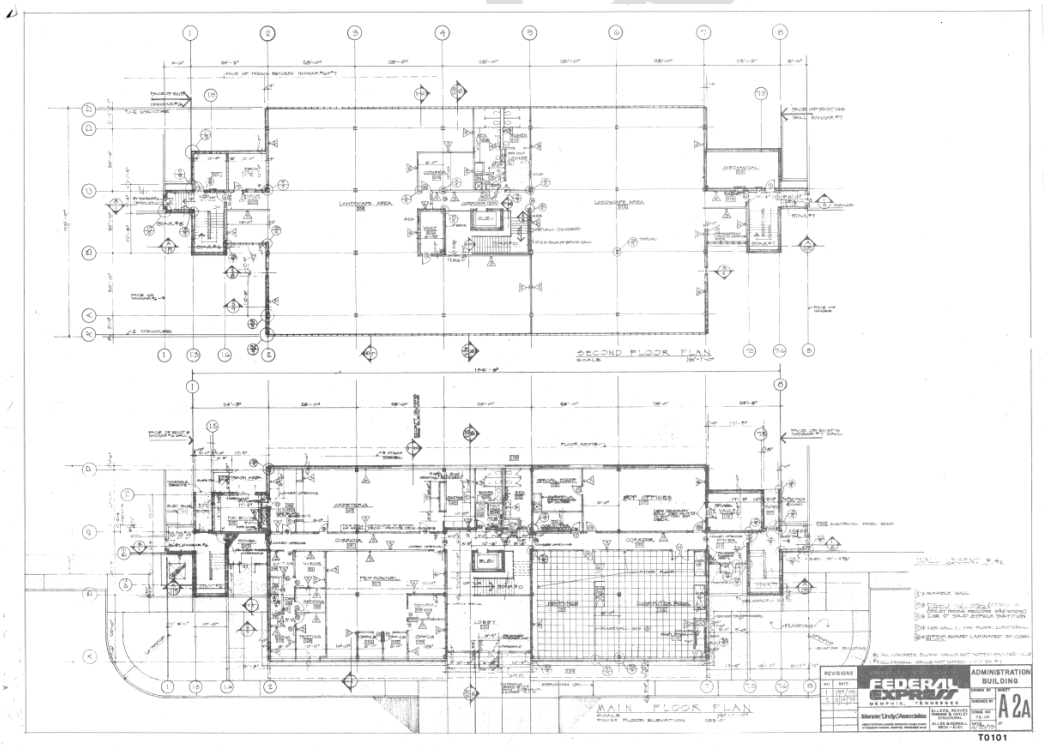


Figure 19: Plan of Administration Building (2861) showing additions circa 1973.

Figure 20: North Façade of Administration Building (2861) showing additions circa 1987 and circa 1988.

Figure 21: East Façade of Administration Building (2861) showing additions circa 1987 and circa 1988.

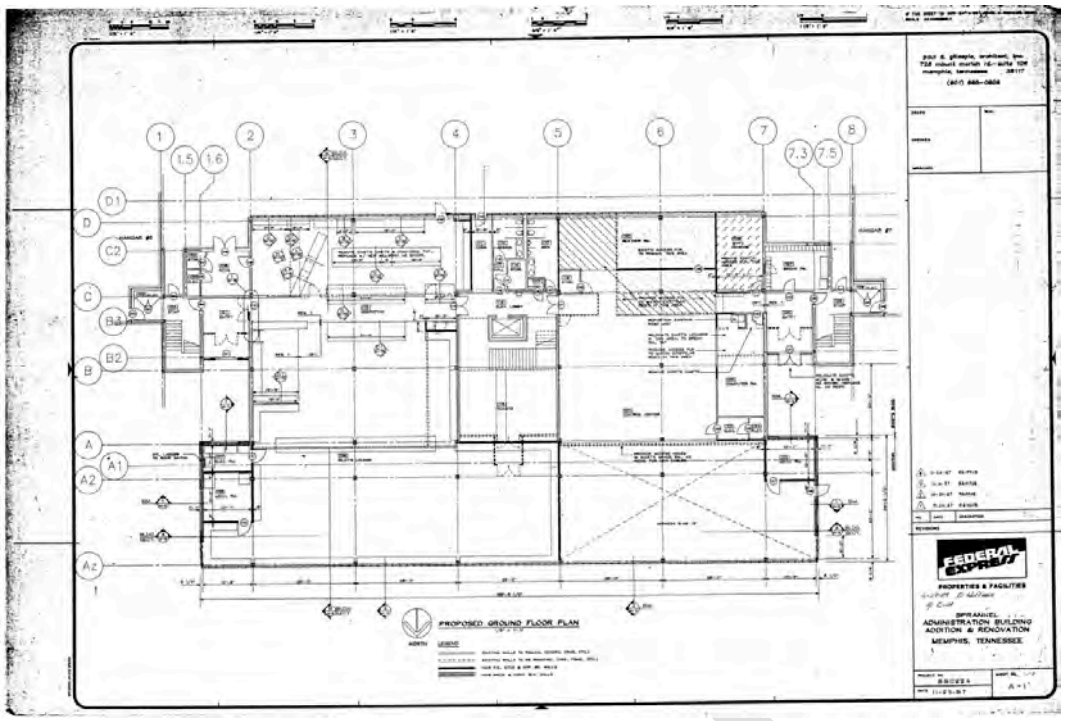


Figure 22: Main Floor Plan of Administration Building (2861) showing additions circa 1987.

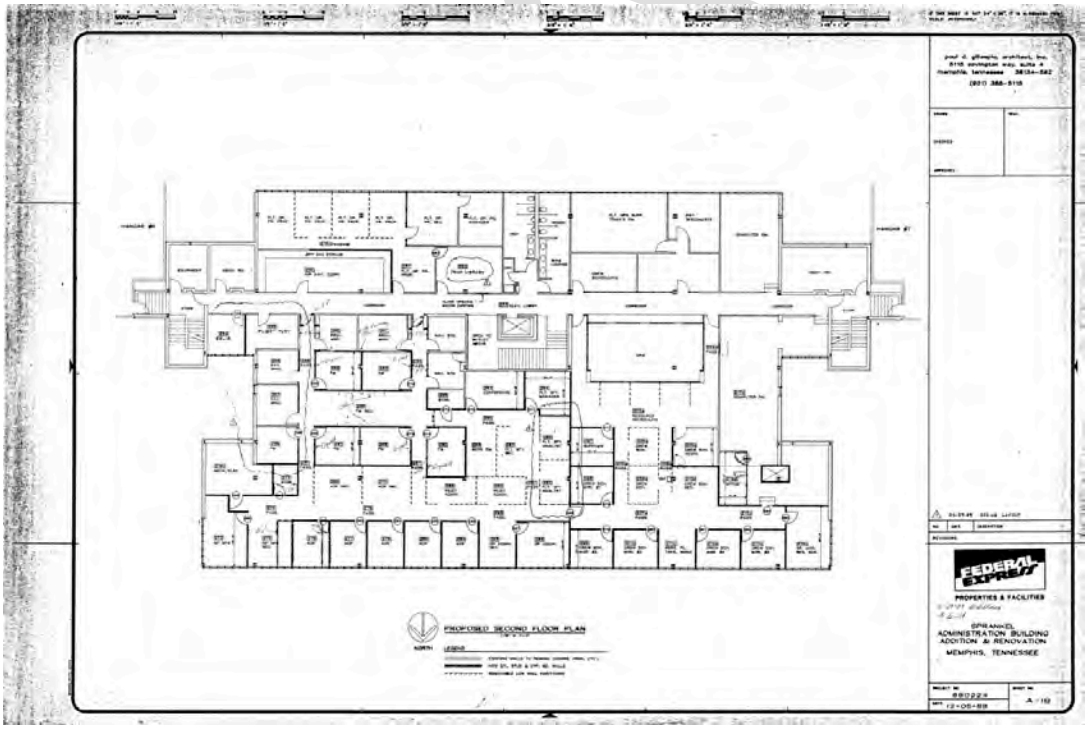


Figure 23: Second Floor Plan of Administration Building (2861) showing additions circa 1987.

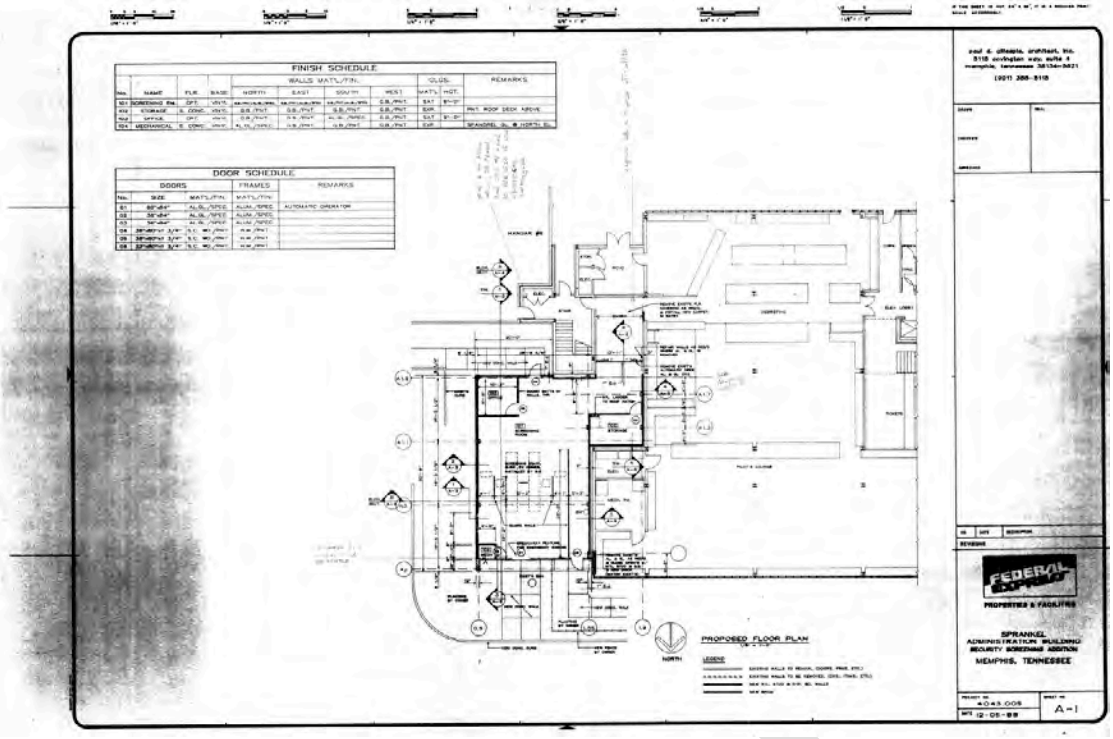


Figure 24: Plan of Administration Building Addition circa 1988 (2861).

Figure 25: Lobby of Administration Building (2861) showing addition circa 1988.

Figure 26: Typical Conference Room of Administration Building (2861).

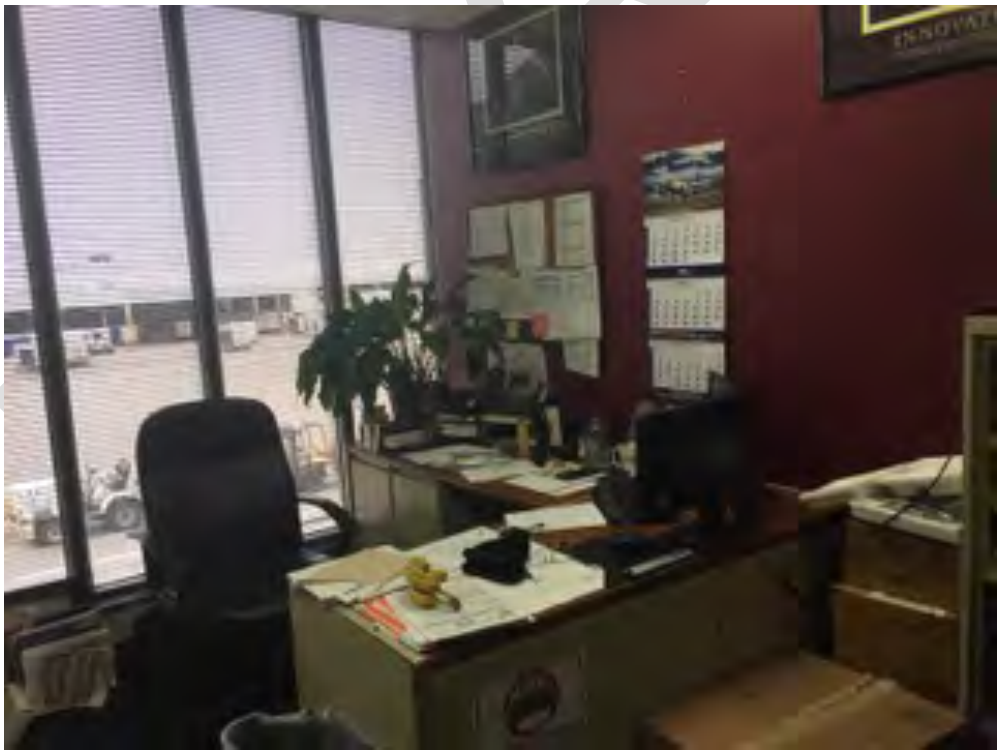


Figure 27: Typical Office in Administration Building (2861).

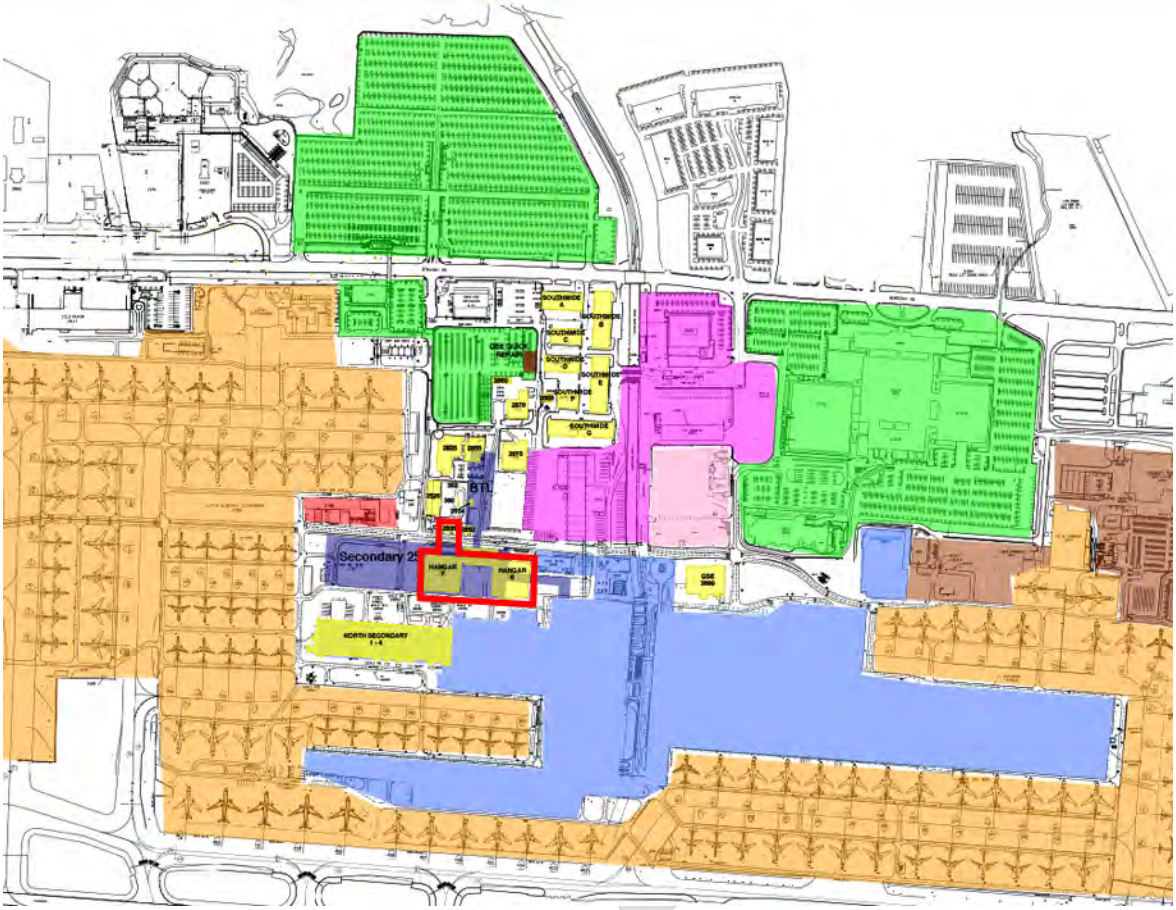


Figure 28: FedEx Ramp Plan depicting (with red outline) the location and boundary of the proposed Memphis Army Air Field Historic District.

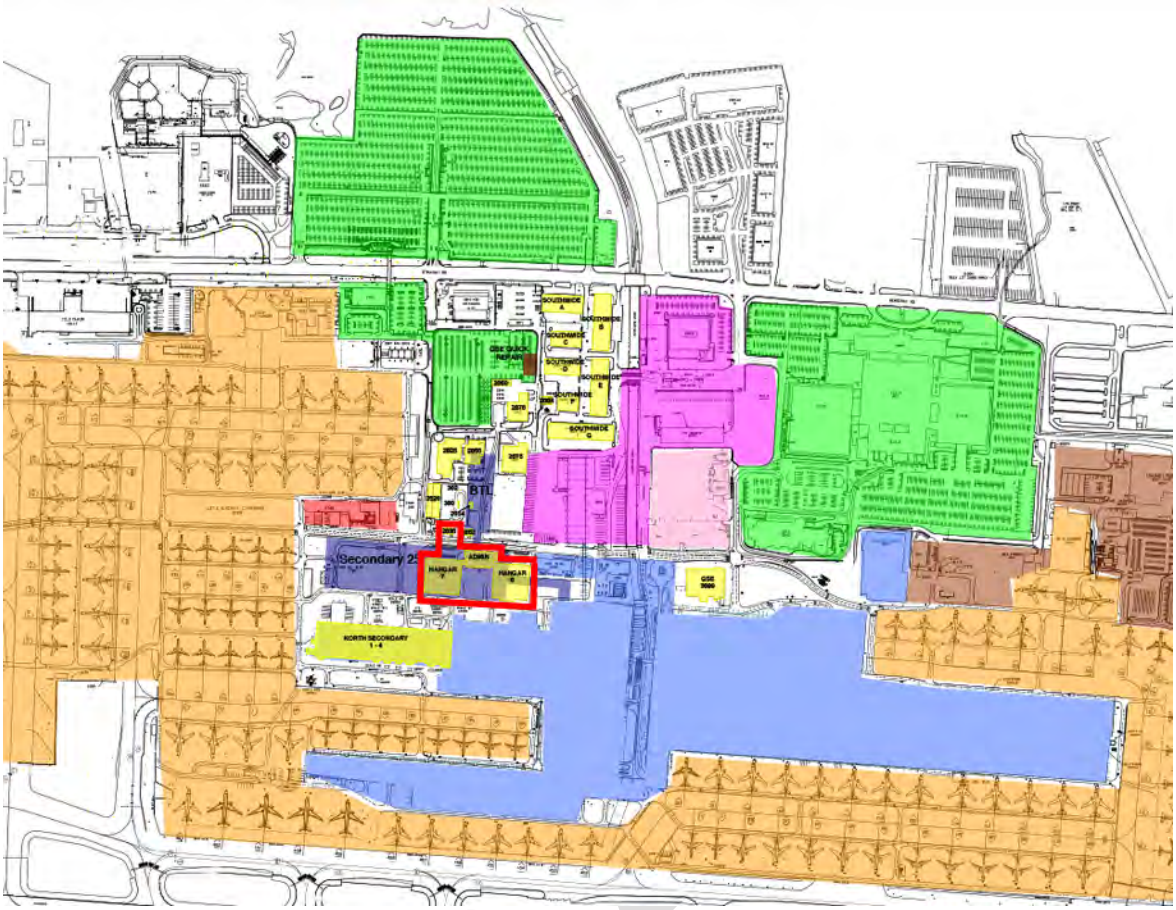


Figure 29: FedEx Ramp Plan depicting (with red outline) the location and boundary of the proposed FedEx Historic District.

ATTACHMENTS

Section 106 Review, National Historic Preservation Act of 1966

Eligibility Criteria of the National Register of Historic Places

National Register of Historic Places, TDOT Summary Sheet

Criteria of Adverse Effects, Codified at 36 CFR Part 800.5

Section 4 (f), TDOT Act Of 1966, TDOT Summary Sheet

ATTACHMENT 1: SECTION 106 REVIEW, NATIONAL HISTORIC PRESERVATION ACT OF 1966

Section 106 of the ***National Historic Preservation Act*** requires that Federal agencies consider what effects their actions and/or actions they may assist, permit, or license, may have on historic properties, and that they give ***the Advisory Council on Historic Preservation (Council)*** a "reasonable opportunity to comment" on such actions. The Council is an independent Federal agency. Its role in the review of actions under Section 106 is to encourage agencies to consider, and where feasible, adopt measures that will preserve historic properties that would otherwise be damaged or destroyed. The Council's regulations, entitled "Protection of Historic Properties" (36 CFR Part 800) govern the Section 106 process. The Council does not have the authority to require agencies to halt or abandon projects that will affect historic properties.

Section 106 applies to properties that have been listed in the ***National Register of Historic Places (NRHP)***, properties that have been determined to be eligible for inclusion in the NRHP, and properties that may be eligible but have not yet been evaluated. If a property has not yet been nominated to the NRHP or determined eligible for inclusion, it is the responsibility of the Federal agency involved to ascertain its eligibility.

The Council's regulations are set forth in a process consisting of four basic steps which are as follows:

1. Initiate Section 106 Process: The Federal agency responsible for the action establishes the undertaking, determines whether the undertaking has the potential to affect historic properties (i.e., properties listed in or eligible for listing in the National Register of Historic Places), and identifies the appropriate State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO). At this time, the agency plans to involve the public and identify other consulting parties.
2. Identify Historic Properties: If the agency's undertaking has the potential to affect historic properties, the agency determines the scope of appropriate identification efforts and proceeds to identify historic properties within the area of potential effects. Identification involves assessing the adequacy of existing survey data, inventories, and other information on the area's historic properties. This process may also include conducting further studies as necessary and consulting with the SHPO/THPO, consulting parties, local governments, and other interested parties. If properties are discovered that may be eligible for the National Register, but have not been listed or determined eligible for listing, the agency consults with the SHPO/THPO and, if needed, the Keeper of the National Register to determine the eligibility status of the property.
3. Assess Adverse Effects: The agency, in consultation with the SHPO/THPO, assesses the potential effects to historic properties affected by the undertaking. The agency at this time will determine that the action will have "no adverse effect" or an "adverse effect" on historic properties. Consulting parties and interested members of the public are informed of these findings.
4. The regulations provide specific criteria for determining whether an action will have an effect, and whether that effect will be adverse. Generally, if the action may alter the

characteristics that make a property eligible for the National Register, it is recognized that the undertaking will have an effect. If those alterations may be detrimental to the property's characteristics, including relevant qualities of the property's environment or use, the effects are recognized as "adverse."

5. Resolve Adverse Effects: The agency consults with the SHPO/THPO and others, including consulting parties and members of the public. The Council may choose to participate in consultation, particularly under circumstances where there are substantial impacts to historic properties, when a case presents important questions about interpretation, or if there is the potential for procedural problems. Consultation usually results in a Memorandum of Agreement (MOA).

If agreement cannot be reached, the agency, SHPO/THPO, or Council may terminate consultation. If the SHPO/THPO terminates consultation, the agency and the Council may conclude the MOA without SHPO/THPO involvement. If the SHPO/THPO terminates consultation and the undertaking is on or affecting historic properties on tribal lands, the Council must provide formal comments. The agency must request Council comments if no agreement can be reached.

ATTACHMENT 2: ELIGIBILITY CRITERIA OF THE NATIONAL REGISTER OF HISTORIC PLACES

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- **CRITERION A**. that are associated with events that have made a significant contribution to the broad patterns of our history (history); or
- **CRITERION B**. that are associated with the lives of persons significant in our past (person); or
- **CRITERION C**. that embody the distinctive characteristic of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that components may lack individual distinction (architecture); or
- **CRITERION D**. that have yielded, or may be likely to yield, information important in prehistory or history (archaeology).

Ordinarily, cemeteries; birthplaces or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years are not considered eligible for the National Register of Historic Places; however, such properties will qualify if they are integral parts of historic districts that do meet the criteria or if they fall within the following categories:

- **EXCEPTION A**. a religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- **EXCEPTION B**. a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- **EXCEPTION C**. a birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his productive life; or
- **EXCEPTION D**. a cemetery which derives its primary significance from graves or persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- **EXCEPTION E**. a reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- **EXCEPTION F**. a property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance; or
- **EXCEPTION G**. a property achieving significance within the past 50 years if it is of exceptional importance.

ATTACHMENT 3: TDOT NATIONAL REGISTER OF HISTORIC PLACES SUMMARY SHEET

What is the National Register of Historic Places?

The National Register, maintained by the Keeper of the Register within the National Park Service, Department of the Interior, is the nation's official list of districts, buildings, sites, structures, and objects significant in American history, architecture, archeology, engineering, and culture.

What are the benefits and restrictions of listing?

In addition to honorific recognition, listing in the National Register results in the following benefits for historic properties:

- Section 106 provides for consideration of National Register listed or eligible properties in planning for Federal, federally licensed, and federally assisted projects;
- Eligibility for certain tax provisions for the certified rehabilitation of income-producing National Register structures such as commercial, industrial, or rental residential buildings;
- Consideration of historic values in the decision to issue a surface mining permit where coal is located in accordance with the Surface Mining Control Act of 1977; and
- Qualification of Federal grants for historic preservation, when funds are available.

Does National Register designation place any additional burdens or obligations on the property owner?

Owners of private property listed in the National Register are free to maintain, manage, or dispose of their property as they choose, provided that no Federal moneys are involved.

How is a property nominated to the National Register?

The first step is for the owner to contact the Tennessee State Historic Preservation Office (TN-SHPO), Clover Bottom Mansion, 2941 Lebanon Road, Nashville, TN 37243-0442; 615-532-1558. Ordinarily, private individuals (or paid consultants) prepare nomination forms. The TN-SHPO submits these nominations to a State Review Board, which meets three times a year. This body reviews the nominations and votes to recommend or deny National Register listing. If approved, the TN-SHPO submits the nomination to the Keeper of the Register in Washington, D.C. for consideration for listing. The Keeper's Office has 45 days to review the nomination, and its decision regarding National Register listing is final.

How long does the nomination process take?

The process varies but typically takes between eight and twelve months.

ATTACHMENT 4: CRITERIA OF ADVERSE EFFECT

Regulations codified at 36 CFR Part 800 require Federal agencies to assess their impacts to historic resources. The regulations provide specific criteria for determining whether an action will have an effect, and whether that effect will be adverse. These criteria are given below.

36 CFR Part 800.5 Assessment of Adverse Effects

(a) *Apply Criteria of Adverse Effect*. In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties, the Agency Official shall apply the criteria of adverse effect to historic properties within the area of potential effects. The Agency Official shall consider any views concerning such effects, which have been provided by consulting parties and the public.

> *(1) Criteria of adverse effect.* An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.
>
> (2) *Examples of adverse effects.* Adverse effects on historic properties include, but are not limited to:
>
> > (i) Physical destruction of or damage to all or part of the property;
> >
> > (ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access that is not consistent with the Secretary's Standards for the Treatment of Historic Properties and applicable guidelines;
> >
> > (iii) Removal of the property from its historic location;
> >
> > (iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
> >
> > (v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;
> >
> > (vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

ATTACHMENT 5: TDOT SECTION 4(F) SUMMARY SHEET

WHAT IS SECTION 4 (f)? Codified at 49 CFR Part 303, "Section 4 (f)" refers to a section of the U.S. Department of Transportation Act which gives special consideration to the use of park and recreation lands, wildlife and waterfowl refuges, and historic sites by Federally assisted transportation projects. Section 4 (f) applies only to those projects using funds from the U.S. Department of Transportation. The law states:

(c) The Secretary may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if -

> *(1) there is no prudent or feasible alternative to using that land; and*
>
> *(2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.*

WHAT IS THE SECTION 4 (f) PROCESS FOR HISTORIC PROPERTIES? To be considered "historic," a property must either be listed in the National Register of Historic Places or be determined eligible for such listing by the Keeper of the Register or the State Historic Preservation Officer (SHPO).

On any project, the primary objective is to develop a design that does not have Section 4(f) involvement. If such a design is not possible, then the Section 4 (f) documentation is prepared and circulated. Such documentation is circulated to all appropriate agencies or groups (consistent with the Section 106 process and the National Environmental Policy Act), and as applicable, to the U.S. Department of the Interior, Housing and Urban Development, and Agriculture. It is also circulated to the agency having authority over the Section 4 (f) property. For historic properties, such agencies are the SHPO and the Advisory Council on Historic Preservation (ACHP). After review of any comments received, the final Section 4(f) documentation is sent to the Federal Highway Administration (FHWA) which determines if the requirements of the Section 4(f) statute are met. If the requirements are satisfied, then the FHWA will approve the use of the Section 4 (f) property.

HOW ARE SECTION 4 (f) AND SECTION 106 RELATED? Section 106 is a provision of the National Historic Preservation Act of 1966, which requires all federal agencies to consider the effects of their projects on historic properties and to provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on those effects. The ACHP has promulgated regulations at 36 CFR Part 800 that describe the procedures that agencies must follow in order to comply with Section 106. Many of the Section 106 documentation requirements overlap the Section 4 (f) documentation requirements for historic properties. For this reason, for projects having a 4(f) use of a historic site, the documentation for Section 106 and Section 4 (f) is usually

combined into one document and circulated to the appropriate groups described above. The consent of neither the SHPO nor the ACHP is necessary for FHWA to approve a Section 4 (f) use, but FHWA gives great consideration to comments from these agencies.

DOCUMENTATION OF EFFECT PURSUANT TO 36 CFR 800 AND SECTION 4(F) EVALUATION

FOR THE PROPOSED FEDEX MEMH TRANSFORMATION PROJECT, PROJECT #8648976, AT THE MEMPHIS INTERNATIONAL AIRPORT

SHELBY COUNTY

October 2017

Prepared by:
Dawn Chapman Ashlock, PhD
Circa Archaeology and Historic Preservation
5710 Ogeechee Road, Suite 200-286
Savannah, GA 31405
Phone (912) 272-1425

HISTORIC AND ARCHITECTURAL ASSESSMENT PURSUANT TO 36 CFR 800 AND SECTION 4(F) EVALUATION

FOR THE PROPOSED FEDEX MEMH TRANSFORMATION PROJECT, PROJECT #8648976, AT THE MEMPHIS INTERNATIONAL AIRPORT

SHELBY COUNTY

MANAGEMENT SUMMARY

FedEx, with approval by the Federal Aviation Administration (FAA), is proposing to deconstruct or demolish 24 structures and construct several new facilities at the Memphis International Airport in Memphis, Shelby County. The project area is located on the south side of Democrat Road along the northern boundary of the secure airport facility.

Pursuant to 36 CFR Part 800.4 and 23 CFR Part 774, cultural resource consultants completed an historical survey of the area of potential effect (APE) for the proposed FedEx Transformation project in 2016. The findings of this survey are presented in this report. The consultants identified three World War II era structures, which were constructed circa 1943. Although the two military aircraft hangars have been altered over time, particularly on the interior, it is the opinion of the consultants that they are potentially eligible for listing on the National Register of Historic places due to the unique design of these structures and their association with World War II aviation. The other World War II era structure is a freestanding Boiler Room that served the two existing hangars and a third hangar that was demolished between 1994 and 1997. The consultants also identified an office building constructed by FedEx in 1973 and altered in 1987 and 1988 as the company's first purpose built headquarters. It is potentially eligible based on Criterion A under Criteria Consideration G, due to its association with the early history of FedEx.

Pursuant to 26 CFR Part 800.5, the consultants applied the criteria of effect to the proposed undertaking. It is the opinion of the consultants that the project, as currently designed, would have an adverse effect on the World War II era structures and the FedEx Administration Building. As a result, the consultants prepared a Section 4(f) Individual Evaluation per the requirements of the Department of Transportation Act of 1966, as amended.

TABLE OF CONTENTS

STATEMENT OF DETERMINATION

FedEx, with approval by the Federal Aviation Administration (FAA), is proposing to deconstruct or demolish 24 structures and construct several new facilities at the Memphis International Airport in Memphis, Shelby County. The project area is located on the south side of Democrat Road along the northern boundary of the secure airport facility.

Due to the requirement for FAA approval for the proposed undertaking, compliance is required with Section 106 of the National Historic Preservation Act of 1966 and the Department of Transportation Act of 1966, as amended. Regulations dealing with the implementation of the National Historic Preservation Act are codified at 36 CFR Part 800, and those pertaining to the Department of Transportation Act of 1966 are codified at 23 CFR Part 774.

The legislation requires projects receiving federal funding or approval to identify any historic properties within the project area or in the vicinity. For the purposes of this legislation, historic significance is defined as those properties that are listed in or eligible for listing in the National Register of Historic Places. The regulations pertaining to the criteria for eligibility are codified at 36 CFR Part 60.4. If historic resources are identified, the legislation requires agencies to determine if the proposed project would affect the historic resources and if the effect would be adverse. If the proposed undertaking would have an adverse effect to an historic property, the National Historic Preservation Act requires the agency to provide the Advisory Council on Historic Preservation (an independent federal agency) an opportunity to comment on the effect. Due to the location of the proposed undertaking on property owned by the Memphis-Shelby County Airport Authority and administered by the FAA, the Department of Transportation Act requires the agency to complete a Section 4(f) evaluation of the proposed undertaking.

Pursuant to 36 CFR Part 800.4 and 23 CFR Part 774, cultural resource consultants completed an historical survey of the area of potential effect (APE) for the proposed FedEx Transformation project in 2016. The findings of this survey are presented in this report. The consultants identified three World War II era structures, which were constructed circa 1943. Although the two military aircraft hangars have been altered over time, particularly on the interior, it is the opinion of the consultants that they are potentially eligible for listing on the National Register of Historic places due to the unique design of these structures and their association with World War II aviation. The other World War II era structure is a freestanding Boiler Room that served the two existing hangars and a third hangar that was demolished between 1994 and 1997. The consultants also identified an office building constructed by FedEx in 1973 as the company's first purpose built headquarters. It is potentially eligible based on Criterion A under Criteria Consideration G, due to its association with the early history of FedEx. The 2016 survey did not identify any additional resources that were listed or potentially eligible for listing within the APE.

No National Register-listed properties are located within the project area. The nearest National Register listed property is Graceland. This property was considered to be outside the APE, because the project area was not visible from the property due to its location in a heavily wooded residential neighborhood, 3.5 miles southwest of the proposed undertaking. The consultants also identified three structures in the vicinity of the APE that were potentially

eligible and merited further research. Two were circa 1950 single-family residences west of the APE, and the other was a commercial structure constructed east of the APE in 1958. None of these structures were included in this survey. They were located approximately 1.25 miles from the APE, which was not visible from their locations due to the position of multi-lane roads and commercial and industrial developments.

Pursuant to 26 CFR Part 800.5, the consultants applied the criteria of effect to the proposed undertaking. It is the opinion of the consultants that the project, as currently designed, would have an adverse effect on the World War II era structures and the FedEx Administration building. As a result, the consultants prepared a Section 4(f) evaluation per the requirements of the Department of Transportation Act of 1966, as amended. The specifications of the proposed project would constitute a use within the meaning of Section 4(f) due to the demolition of the 4(f) properties and the permanent incorporation of the site of these properties into the proposed Secondary 25 FedEx sort facility. Pursuant to 23 CFR Part 774.13(d)(5) of Section 4(f) of the U.S. Department of Transportation Act, when Section 4(f) properties are identified that will require permanent incorporation, the Official with Jurisdiction (OWJ) for the resource must be notified and concur in writing to the Section 4(f) use. When National Register listed or eligible properties are identified as Section 4(f) properties, the OWJ is the State Historic Preservation Officer. In order to document compliance with 23 CFR Part 774.13(d)(5), a written agreement is required for the project file showing that the OWJ concurs with the permanent incorporation of the Section 4(f) resource.

This document has been prepared in consultation with the TN-SHPO and will be provided to the TN-SHPO, the federally recognized Native American Tribes, Shelby County and Memphis Public Participation List, and the property owner for comment.

PROJECT DESCRIPTION

FedEx Express (FedEx) is proposing a project to update and modernize its facilities at the Memphis International Airport (MEM) in Memphis, Tennessee. Figure 1 shows the airport location. An outdated package sorting facility would be replaced with facilities specifically designed to accommodate modernized, more efficient equipment. At its core, the purpose of the project is to replace operations, structures and equipment that are approaching the end of their useful life with modern operations, structures and equipment to improve the efficiency of FedEx's business processes. New structures would be constructed using green building standards to the extent feasible to limit environmental impacts.

Understanding the Scope of the FedEx Memphis World Hub

In order to understand the significance of the proposed project and the reasons why FedEx has proposed to construct a new secondary sort facility on the location of the Section 4(f) properties discussed in this evaluation, it is useful to briefly address the scope of FedEx operations at the Memphis International Airport (MEM). This unique facility has been the center of FedEx operations throughout the world since 1973. Although regional operations have been augmented through the construction of regional Hubs throughout the world, this facility remains the core of all FedEx operations and is differentiated from regional facilities with the designation as the Super Hub. The operational system that moves nearly all packages to a central hub before transporting them to their final destination is the cornerstone of the entire FedEx business model and has revolutionized the industry. Although the majority of packages arrive at this facility on flights from one of the regional Hubs in order to be sorted and redirected to their final destination, it also serves as a regional Hub by accepting packages from Memphis and the surrounding region, which occur via truck and tractor-trailer receiving docks known as the Bulk Truck Load (BTL). The packages are unloaded, screened, and transferred to the Main and Secondary Sort facilities on conveyor belts and bridge constructed over Sprankel Avenue. Once packages are sorted, they are transferred to each of the departing flights using tugs or ground support equipment (GSE).

The scope of this facility and its importance to FedEx operations and secondary business operations throughout the world is difficult to adequately convey. The Super Hub (Hub) employs over 10,000 people, is over 880 acres in size, and has the capacity to park more than 165 aircraft at a time, which equates to one aircraft landing every 40 seconds during peak operations. The Hub handles approximately 150 flights in and out during its night sort and 90 during its day sort operations. In addition to air cargo, the Hub receives cargo from approximately 130 trucks each night, making the BTL an integral part of operations at this facility. The night sort handles an average of 1.3 million packages (and during peak season several million), and the day sort averages 500,000 to 600,000 packages. Most of these packages arrive and depart within three hours. This means that the Memphis International Airport is the busiest airport in the world between 10 pm and 4 am. The longstanding importance of this Hub to FedEx and other business operations is demonstrated by the fact that

Memphis and Hong Kong have been the busiest air cargo facilities in the world for more than two decades.

The economic impact of the Memphis International Airport and FedEx operations were recently studied by the Sparks Bureau of Business & Economic Research at the University of Memphis. In their 2016 report, they stated that the "Memphis International Airport continues to be the single most important public infrastructure investment available to support economic activity in the Mid-South."[1] That same study emphasized the importance of the Hub in generating that economic activity, noting that cargo aircraft operations made up 60 percent of all air operations at MEM and 99 percent of that cargo is handled by FedEx. When considering the direct, indirect, and induced effects of this operation and the 4.8 billion pounds of air cargo processed in this facility, the researchers estimated that the FedEx cargo operations have resulted in $14.1 billion in the production of goods and services, labor income of over $3.5 billion, 61,517 full and part-time jobs, approximately $740 million in state and local taxes; and $9.5 billion in cargo revenue.

For over four decades, FedEx has invested in this facility and other administrative operations facilities in Memphis. The facility began as several repurposed World War II buildings, Tennessee Air National Guard structures, and a newly constructed FedEx Administration Building. It has been designed and developed over the years to accommodate the traffic flow necessary for employees, trucks, GSE, and aircraft to operate in this facility. As the available land in the secure airport facility has decreased, it has become increasingly important to upgrade existing facilities and maximize operational efficiency, which has led directly to the proposed project.

Project Details

Under the Proposed Development Action, FedEx would deconstruct or demolish 24 outdated structures that are located in the middle of their 880 acre Hub at MEM and are not currently accessible by the public in order to construct several new facilities. At its core, the purpose of the project is to replace operations, structures and equipment that are approaching the end of their useful life with modern operations, structures and equipment to improve the efficiency of FedEx's business processes. Additionally, the new structures would be constructed using green building standards to the extent feasible to limit environmental impacts. The project would be constructed in phases as funding becomes available. Initially, buildings 1-23 would be demolished and the slabs removed. Next, FedEx would construct the facilities listed below. Finally, after the Secondary 25 sorting facility becomes operational, the Secondary 1-4 would be demolished.

The structures to be demolished or deconstructed are:

1. Hangar #6 (Building 2879)
2. Hangar #7 (Building 2837)

[1] University of Memphis, *Sparks Bureau of Business and Economic Research* (http://www.memphis.edu/sbber/reports.php, 2016).

3. Admin (Building 2861)
4. GSE (Building 3099)
5. Southwide A
6. Southwide B
7. Southwide C
8. Southwide D
9. Southwide E
10. Southwide F
11. Southwide G
12. Building 2860
13. Building 2878
14. Building 2884
15. Building 2875
16. Building 2855
17. Building 2825
18. Building 2838
19. Building 2852
20. Building 380
21. Building 382
22. Building 2826
23. Building 2854
24. North Secondary 1-4

After demolition of buildings 1-23 listed above, and removal of the associated slabs, FedEx would construct several new facilities and improve existing facilities in order to modernize facilities and equipment and improve efficiency.

Under the proposed action, FedEx would construct the following new facilities:

1. Secondary 25 Building – The Secondary 25 sorting facility would have a footprint of approximately 328,000 sq. ft. The building would be 90-100 feet tall and consist of four levels of sort conveyors, process equipment, and office space. The exterior of the building would consist of insulated metal panels, translucent wall panes, and dynamic glazing. Plans are to have the building LEED-certified. The structure would be built south of Sprankel Avenue and north of the North Input structure, and would replace the existing North Secondary 1-4 facility. Its site encompasses all of the current Hangar 7 and Admin Building sites, and part of the Hangar 6 site.

2. Matrix/Secondary 25 Bridge – This would be a new 25,000 sq. ft. conveyor (box truss) bridge extending from the existing East and West Matrix to the new Secondary 25 building. The Matrix/Secondary 25 Bridge would be conditioned and enclosed with the same exterior material system as the other new facilities.

3. Bulk Truck Load (BTL) Building – This would be a new, 65,000 sq. ft. building and contain an automated sort system. The building would be approximately 50-60 feet tall and

consist of two levels of sort conveyors, process equipment and office space. The BTL building would be enclosed with the same exterior material system as described for the Secondary 25 building.

4. Secondary 25/BTL Bridge – This would be a new conveyor (box truss) bridge, approximately 10,000 sq. ft. that extends from the Secondary Sort Building to the new BTL Building. The Secondary 25/BTL Bridge would be conditioned and enclosed with the same exterior material system as the new facilities.

5. Ground Support Equipment (GSE) Maintenance Facility – This would be a new, 6,000 square-foot facility used for maintenance of ground support equipment (GSE). Design of the new structure is not yet complete, but it would be a single story of no more than 30 feet in height. It would be an open space with a slab floor, and would include some storage of lubricants and other items used for routine preventative maintenance of the GSE vehicle fleet, especially oil changes, and also for minor repairs.

Once the Secondary 25 and BTL facilities and sort systems are fully operational, FedEx would deconstruct/demolish the North Secondary 1-4 (2899) facility down to slab level, totaling approximately 167,000 sq. ft. At this time FedEx has no plans regarding the remaining slab. The structures that would be demolished or deconstructed, and the proposed newly constructed structures are shown on Figure 2.

To guide the demolition and deconstruction process, FedEx and its contractors would first prepare a Demolition/Deconstruction Waste Management Plan certified under the Leadership in Energy and Environmental Design (LEED) certification program. The 24 structures and associated slabs would be assessed for the potential to recycle the building materials to the extent feasible, and those portions of the structures would be deconstructed to maintain the value of the recycled materials. Materials with no recycled value would be assessed for hazardous materials content and disposed of in an appropriate landfill. The demolition, deconstruction, and construction contractors would employ industry-standard best management practices (BMPs) that would minimize environmental and human health impacts to the maximum extent feasible.

The purpose of the proposed project is to upgrade and modernize the FedEx Memphis World Hub, which has developed over a 44-year period. During that time, technology and sort systems have improved exponentially, security demands have increased, competition has increased, and upgrading and modernization have become a necessity to sustain the MEM position as FedEx's premier hub. The proposed action would modernize package sorting facilities and improve traffic flow through the FedEx Memphis hub. The sort buildings in the area at issue are the "heart" of the FedEx Hub, and over decades the incredible growth and development at the Hub has radiated outward from that heart. The proposed Secondary 25 sort building must be built in the proposed location, because it has to remain at the heart of the FedEx Hub adjacent to the primary sort building. Overall efficiency would be improved at MEM by eliminating outdated, inefficient facilities, some of which have been vacant for many years, and establishing new

staging areas, which would segregate truck movements from the flow of ground service equipment.

The site plan is divided by Sprankel Avenue with employee access/security check points and truck access, staging, and loading areas located north of this road. The existing sort facility is located south of this road near the center of the site. The existing Bulk Truck Load area and associated access roads would be expanded into the adjacent space to the west, which is currently occupied by the vacant TANG and Southwide Center office buildings. This is a reasonable location for these operations, because it provides direct access to Democrat Road, which defines the northern boundary of the secure airport facility and is contiguous to similar existing operations. This location also limits the amount of vehicular traffic into the FedEx facility, which minimizes the potential for tractor trailers and other street legal vehicles from operating in close proximity to the Ground Support Equipment (GSE) necessary to transport sorted packages to aircraft, which improves employee safety. The Secondary 25 sort facility would be located northwest of the existing primary and secondary sort facility in an area currently occupied by Hangar No. 6 and Hangar No. 7, the Boiler Room, and the Administration Building. This is the required location for these operations, because the operations planned for this structure would need to function as an integral part of the existing sort operations.

AVOIDANCE ALTERNATIVES

A Section 4(f) evaluation must demonstrate that avoidance alternatives to the project under consideration have been evaluated. Specifically, the evaluation must include a discussion that will ultimately support a determination of whether or not an avoidance alternative is feasible and prudent in the final evaluation.

A final determination that no feasible and prudent avoidance alternatives exist is withheld until after the draft evaluation has been circulated to the appropriate agencies and all issues have been appropriately evaluated. The final determination may be made in the final evaluation or in the Record of Decision (ROD) or the Finding of No Significant Impact (FONSI).

This discussion of feasibility and prudence must comply with the regulatory criteria located in the definition of "feasible and prudent avoidance alternative" in 23 CFR 774.17. These criteria specify that an alternative is not feasible if it cannot be built as a matter of sound engineering judgment. Although the Avoidance Alternatives described in this Section 4(f) evaluation appear to be feasible as defined by the Department of Transportation Act of 1966, as amended, there are several aspects of the prudent determination criteria which suggest that the following avoidance alternatives may not be considered to be prudent, including whether an alternative:

- compromises the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need;
- results in unacceptable operational problems;
- causes severe economic impacts;

- results in additional construction or operational costs of an extraordinary magnitude; or
- causes other unique problems or impacts of an extraordinary magnitude.

If it appears that the final evaluation may conclude that there is no avoidance alternative that is feasible and prudent, then the draft evaluation should also provide a least overall harm analysis of the remaining alternatives under consideration. This is done by balancing, or comparing, the alternatives under consideration in terms of the seven factors specified in 23 CFR 774.3(c). FHWA can only approve the alternative that is found to cause the least overall harm after consideration of these factors. The basis for and determination of which alternative results in the least overall harm will be documented in the final Section 4(f) evaluation.

AVOIDANCE ALTERNATIVE #1:

In order to minimize adverse effects to potentially eligible historic structures, a no-build alternative was investigated (Figure 3). This alternative does not appear to be feasible or prudent, because it would require FedEx to continue to operate in an outdated and inadequate sort facility. This facility was designed and implemented over a 44-year period, and it is no longer able to adapt to advancements in technology and sort systems, which have improved significantly in the last four decades. The facility must be replaced in order to maintain operations at the Memphis Hub well into the future. In addition, FedEx must maintain operations in the existing secondary sort building until a replacement facility is constructed and operational. The no-build alternative would also require the following actions, which would result in additional construction and operational costs of an extraordinary magnitude:

- The overall layout of the Hub would have to be redesigned;
- Other areas would have to be repurposed or moved;
- Traffic flows would be disrupted and need to be redesigned;
- “Sunk costs” in previously developed facilities would be lost; or
- FedEx would have to abandon the proposed project at Memphis and invest in modernization and upgrades at one of its other U.S. hubs, which would have a severe adverse economic impact on the Memphis metropolitan area, causing severe disruption to established communities that depend on the FedEx Hub for employment, as well as businesses who in many cases have invested heavily in facilities in Memphis to be located near the Hub.

AVOIDANCE ALTERNATIVE #2:

In order to minimize adverse effects to potentially eligible historic structures, alternate locations for the Secondary 25 sort facility west, south, and east of the existing sort facility were investigated (Figure 4). These alternate locations did not appear to be feasible or prudent for the following reasons:

- Each is currently used for aircraft staging, fueling, and loading. As such, there are specially engineered and constructed gates, ramps, and fueling equipment to support these operations. Altering these facilities would result in additional construction and operational costs of an extraordinary magnitude.

- Due to their position relative to the existing sort facility and cargo intake area, each of the alternative locations would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need and would result in unacceptable operational problems. The primary objective of this project is to replace outdated facilities and equipment, which would improve the efficiency of the facility in receiving and processing packages. It is essential to the overall project goals that the new Bulk Truck Load area and associated sort facility align with the operational flow of the existing primary sort and Hub. The location of the Secondary 25 sort facility west, south, or east of the existing sort facility would not accomplish this goal.

AVOIDANCE ALTERNATIVE #3:

In order to minimize adverse effects to potentially eligible historic structures, alternate locations for the Bulk Truck Load area and Secondary 25 sort facility were investigated north of Sprankel Avenue (Figure 5). In this design scheme, the Bulk Truck Load area would be located in the area currently occupied by the vacant Southwide buildings, and the sort facility would be located in the area of the vacant TANG structures. This alternative does not appear to be feasible or prudent, because the area is not large enough to accommodate the truck traffic, staging, and loading facilities, as well as a safe and operationally sound sort facility for the following reasons:

- Based on the design criteria of the Secondary 25 sort facility, the necessary square footage and proportions of the building footprint for the proposed facility would exceed the space available in the area of the existing TANG buildings. In order to construct a sort facility in this location, FedEx would need to relocate the existing Bulk Truck Load area to the area currently occupied by the Southwide Center buildings, which would reduce or nearly eliminate the current truck and tractor-trailer access and staging areas necessary to utilize the Bulk Truck Load areas and deliver packages to the sort facility. This location would also leave no remaining space to construct the new BTL facility. This alternative would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need and would result in unacceptable operational problems.

- It would also pose a safety hazard by limiting the maneuverability of delivery trucks and tractor-trailers when cornering and turning around on site. By constructing a new Bulk Truck Load area in the vicinity of the existing Southwide Center buildings without expanding the associated access and staging areas, the access roads would be over utilized, causing traffic congestion that would limit the effectiveness of the new Bulk

Truck Load area and Secondary 25 sort facility to the extent that the project would not be financially viable. This alternative would result in additional construction and operational costs of an extraordinary magnitude.

- This location would also be operationally unsound, because it would separate the Secondary 25 sort facility on the opposite side of Sprankel Avenue. In order for the sort equipment and assembly line to meet operational requirements, the new sort facility must be located adjacent to the existing sort facility and contiguous with the cargo intake area. This alternative would it would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need and result in unacceptable operational problems.

AVOIDANCE ALTERNATIVE #4:

In order to minimize the adverse effects to potentially eligible historic structures, an alternate location for the Bulk Truck Load area and Secondary 25 sort facility was investigated north of Democrat Road and south of Nonconnah Creek in an area currently used for employee parking (Figure 6). This area is located across a large public road outside of the perimeter of the secure airport facility. This design scheme does not appear to be feasible or prudent for the following reasons:

- Based on the design criteria of the Secondary 25 sort facility, the necessary square footage and proportions of the building footprint for the proposed facility would exceed the space available in the area of the existing employee parking area. In order to construct a sort facility in this location, FedEx would need to expand beyond the area of the existing parking lot, which is problematic, as it is bounded on the north and east by Nonconnah and Hurricane Creeks. As a result, this alternative would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need and would result in unacceptable operational problems.

- By locating the Bulk Truck Load and Secondary 25 sort facility outside of the Level 1 Security portion of the airport facility, all packages and personnel transferred to this unsecured Bulk Truck Load and Secondary 25 sort facility would need to be processed through security screening when both exiting and entering the Level 1 secure zone. Statistically, each time a person or object leaves and returns to the secure area, there is an opportunity for a security failure. This would be operationally unsound and would reduce the effectiveness of the new Bulk Truck Load area and Secondary 25 sort facility to the extent that the project would not be operationally or financially viable. In order to incorporate this area into the Level 1 Security portion of the airport facility, the following actions would need to occur:

    1. The airport would need to exercise eminent domain to incorporate a minimum of 0.5 mile of Democrat Road, which is a 4-lane road with a center turning lane that provides access from this area to the adjacent interstate highway, into the Level 1 Security area.

2. Relocation of Democrat Road around the north side of the new Bulk Truck Load area and Secondary 25 sort facility, which is unlikely to be approved given the potential impact to Nonconnah and Hurricane Creeks.
3. This location would also be operationally unsound, because it would separate the Secondary 25 sort facility on the opposite side of Sprankel Avenue. In order for the sort equipment and assembly line to meet operational requirements, the new sort facility must be located adjacent to the existing sort facility and contiguous with the cargo intake area.

SURVEY METHODOLOGY

METHODS

Federal laws require the FAA to comply with Section 106 of the National Historic Preservation Act of 1966, including amendments effective August 5, 2004 (Attachment 1). This legislation requires the FAA to identify any properties of historic significance affected by proposed undertaking, including above ground buildings, structures, objects, or historic sites, as well as below ground archaeological sites. For the purposes of this legislation, properties with historic significance are defined as those that have been listed in the National Register of Historic Places or are eligible for inclusion in the National Register of Historic Places (Attachments 2 and 3).

In order to comply with Section 106 of the National Historic Preservation Act of 1966 as amended, consultants surveyed the area of potential effect (APE) for this project in compliance with 36 CFR Part 800 regulations. The APE of a potential undertaking is defined in 36 CFR Part 800.16 (d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking." The survey area for this project included the entire APE, as well as historic properties in the project vicinity that may be affected by changes in air quality, noise levels, setting, and land use (Attachment 4).

The purpose of this survey was to identify resources currently listed in the National Register of Historic Places or those that are potentially eligible for inclusion in the National Register of Historic Places (Attachments 2 and 3). In order to identify all listed, eligible, and potentially eligible properties, the survey included two components: a literature review and records search and a field survey. Dawn Chapman Ashlock conducted the literature review and records search between May 2, 2016 and June 15, 2016, and Dawn Chapman Ashlock and Phillip Ashlock II completed the field study between May 9, 2016 and May 13, 2016. These methods contributed to a thorough evaluation of each property with respect to the Criteria and Criteria Considerations, as well as the identification of potential integrity issues.

The literature review included research in the National Register of Historic Places, the state historic resources inventory collected and maintained by the Tennessee Historical Commission, and historic aerial photograph and topographic map collections to develop a timeline for the construction of each of the affected properties. Two additional sources, which were integral to the production of the historic resources survey (Historic Resources Survey) and this Section 4(f) evaluation, include two publications spearheaded by the Air Force Air Combat Command (ACC) and funded by the ACC and the Department of Defense (DoD) Legacy Resource Management Program.[2] Julie L. Webster's thorough research and analysis of military aircraft hangars in the possession of the Department of Defense provided the foundation of this program.[3] This

[2] Julie L. Webster and Gordon L. Cohen, "Military Aircraft Hangars: Footprints through a Century of Flight," *CRM* Vol. 24, No. 3 (2001): 29-31.
[3] Julie L. Webster, *Historical and Architectural Overview of Military Aircraft Hangars: A General*

publication was initially unavailable for incorporation into this report, because it had not been formally reviewed by the Army Corps of Engineers and released for public distribution. The consultants coordinated with the Army Corps of Engineers Construction Engineering Research Laboratory in Champaign, Illinois to expedite the review process, and the report was released to the public on June 15, 2016. Another source that was pivotal to the development of the historical context was Jayne Aaron's expansion upon the Webster publication in 2011 to include military aircraft hangars in the possession of the Reserves and National Guard installations.[4]

In addition to these surveys, the consultants completed a pedestrian survey of the project area to identify and photograph each of the 24 properties scheduled for demolition in the proposed scope of work to determine their location, physical condition, and integrity.

For all historic properties identified in the APE and those beyond the APE that may be adversely affected by the proposed undertaking, the U.S. DOT Act of 1966 requires the completion of a Section 4(f) evaluation in compliance with 23 CFR Part 774 regulations. This evaluation established the requirement for projects receiving funding or requiring approval by an agency of the Department of Transportation to consider historic properties in all transportation development projects. Before funding or approving a transportation development project, the FAA must first establish whether or not there are Section 4(f) properties in the APE. If so, the FAA must either determine that the impacts are *de minimis* or complete a Section 4(f) evaluation. For the purposes of this legislation, a *de minimis* impact is one that would not adversely affect the activities, features, or attributes of an historic property. If the impact is not *de minimis*, the Section 4(f) evaluation must be completed in order to identify a feasible and prudent alternative and ensure that all possible planning to minimize harm has occurred. If a Section 4(f) evaluation identifies a feasible and prudent alternative that has no effect on an historic property, this alternative must be selected. If none of the alternatives are prudent and feasible, the FAA must select the alternative that minimizes the adverse effect to he historic properties.

RESULTS

Consultants accessed the survey records of the Tennessee State Historic Preservation Office (TN-SHPO) to determine if any previous architectural surveys had identified any historic properties in the area. The TN-SHPO has conducted a survey of this portion of Shelby County, and no National Register-listed properties or eligible properties were previously identified within the project area. The nearest National Register listed property is Graceland, which is located 3.5 miles southwest of the project area in a large residential neighborhood (Figure 7). This property was considered to be outside the APE, because the project area was not visible from Graceland due to its location in a heavily wooded residential neighborhood 3.5 miles

---

History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations (Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999).

[4] Jayne Aaron, *Historical and Architectural Overview of Aircraft Hangars of the Reserves and National Guard Installations from World War I through the Cold War,* (Air Force Air Combat Command, 2011).

southwest of the project area. The nearest potentially eligible properties identified in the TN Historical Commission Viewer were located approximately 1.25 miles west of the project area and consist of two circa 1950 single-family dwellings. SY20479 is located in an industrial area west of Plough Boulevard, which is a four lane divided highway forming the western boundary of the airport complex. SY20480 was also a single-family dwelling located adjacent to the previous property in the industrial area, but it has been demolished since the most recent TN-SHPO survey of this area. SY20479 was considered to be outside the APE, because the project area is not visible from this property due to the location of an industrial building located at 2250 Byrn Street. In addition, the area between the industrial development and the project area is obscured by Plough Boulevard and approximately 0.9 miles of aircraft staging, loading, and fueling areas at the FedEx Memphis Airport Hub. The next nearest potentially eligible property identified in the TN Historical Commission Viewer is a 1958 commercial structure located approximately 1.5 miles northeast of the project area at the intersection of Pearson Road and Lamar Avenue. This property, SY35345, was considered to be outside the APE, because the project area is not visible from the property. It is separated from the project area by numerous buildings in a low-rise industrial development, Democrat Road, Tchulahoma Road, and the northeast portion of the Memphis International Airport and the FedEx ramp, which includes the low to mid-rise Memphis Air Route Traffic Control Center and the eastern FedEx employee security and training facilities (Figure 8).

As a result, the consultants limited the APE to the area to be included in the proposed project (Figure 9). Democrat Road defines the boundary on the north side of the APE. Hurricane Creek, Independent Drive, and Republican Drive define the boundary on the east. Sprankel Avenue and the GSE lanes south of Hangar No. 6 and the North Secondary Sort 1-4 define the boundary on the south. The GSE lanes west of the North Secondary Sort 1-4 and Hangar No. 7, Sprankel Avenue, Tang Street, Technocrat Lane, the GSE lanes west and north of Building 2878 and Building 2860, and Southwide Drive define the boundary on the west.

Consultants performed a field survey of the APE between May 9, 2016 and May 13, 2016. This field survey located and photographed all properties in the APE to be demolished in the proposed undertaking and identified and documented all potentially eligible historic properties in the APE. Although the primary objective of the survey was to determine the potential for National Register eligibility of any individual resources or historic districts in the area, it also collected information on the setting, structural condition, history, and integrity of each of the potentially eligible historic properties. In total, the field survey inventoried 24 properties, collecting varying levels of information depending on the date of construction, integrity, and history of each property. This included the Southwide Center buildings, TANG buildings, FedEx ground support equipment (GSE) hydrogen fueling station, FedEx Administration Building, FedEx paint shop, and the World War II military aircraft hangars and associated Boiler Room.

The consultants did not believe that the Southwide Center buildings or the FedEx paint shop met the eligibility requirements for inclusion on the National Register of Historic Places. Although they did not believe that the TANG buildings or the FedEx GSE hydrogen test facility met the eligibility requirements, they gathered additional information for these buildings due

to the possibility that they may be considered potentially eligible under Criterion Consideration G. At the conclusion of the field survey, the consultants believed that the FedEx Administration Building had the potential to meet the eligibility requirements under Criteria Consideration G. As a result, interior and exterior photographs were taken of the building and additional information was collected. Due to the age and unique design of the World War II military aircraft hangars and associated Boiler Room, the consultants believed that all of the World War II era structures met the eligibility requirements for inclusion on the National Register of Historic Places.

PUBLIC PARTICIPATION

NATIVE AMERICAN TRIBAL CONSULTATION LIST

FAA has initiated consultation with nine Native American tribes or representatives, by notifying each of the project description and asking if they would like to participate in the Section 106 review process as a consulting party.

David Cook, Kialegee Tribal Town
Karen Brunso, The Chickasaw Nation
Robin Dushane, Eastern Shawnee Tribe of Oklahoma
Kim Jumper, Shawnee Tribe
Eric Oosahwee-Voss, United Keetoowah Band of Cherokee Indians
Corain Lowe-Zepeda, Muscogee (Creek) Nation
Everett Bandy, Quapaw Tribe of Oklahoma
Emman Spain, Thlopthlocco Tribal Town
Daniel Ragle, Choctaw Nation of Oklahoma

The Environmental Division of the Tennessee Department of Transportation prepared and maintains a list of historic groups and other such organizations by county, which might be interested in consulting on proposed projects. According to this list, there are twelve individuals, organizations, and historical societies located in Shelby County. Each have been notified of the project description and asked if they would like to comment on the proposed project.

SHELBY COUNTY AND MEMPHIS PUBLIC PARTICIPATION LIST

Jimmy Ogle, Shelby County Historian
Memphis Area Association of Governments
Mayor Mark Luttrell, Shelby County
Cecelia Franklin, Association for the Preservation of Tennessee Antiquities
Rick Copeland, Memphis and Shelby County Division of Planning and Development
Judy Peiser, Center for Southern Folklore
Laura Todd, Shelby County Historical Commission
Carol Perel, West Tennessee Historical Society
June West, Memphis Heritage, Inc.
Jimmy McNeil, Department of the Army Corps of Engineers, Memphis District
Mayor Jim Strickland, City of Memphis
Brian Bacchus, Memphis Landmarks Commission

PROPERTY OWNERS

Memphis-Shelby County Airport Authority
2491 Winchester Road
Memphis, Tennessee 38116
(901) 398-8375

DESCRIPTION OF PROPOSED MEMPHIS ARMY AIR FIELD HISTORIC DISTRICT

The proposed Memphis Army Air Field Historic District was established in the associated Historic Resources Survey. A detailed description of the proposed historic district boundary is included in this evaluation (Figure 10). According to the Historic Resources Survey, the district is potentially eligible for listing on the National Register of Historic Places under Criteria A and C. The recommendation of eligibility under Criterion A is based on the association of the Section 4(f) properties in the proposed district with the exponential expansion and transition of the U.S. Army Air Corps into the U.S. Army Air Forces during World War II, which paved the way for the establishment of the U.S. Air Force as an independent branch of the armed forces following the war, as well as the representation of the domestic war effort. In addition, it is the recommendation of the consultants that the Section 4(f) properties in the proposed district are potentially eligible for listing under Criterion C due to their unique, asymmetrical design and the rarity of extant wood bow truss hangars in the United States.

Historic properties are potentially contributing properties to a proposed National Register Historic District if they are associated with the historic theme or events used to define the district and date to the period of significance. Within the context of the development of American air power, the Memphis Army Air Field was likely on the forefront of this growth in the 54-Group Plan established in late 1940, when the AAC used existing civil air fields to expedite the construction of tactical fields. This would place the Memphis Army Air Field among a group of approximately 400 tactical fields nationwide that were intended to be operational as quickly as possible in order to protect the home front. The contributing properties of the proposed Memphis Army Air Field Historic District included two World War II military aircraft hangars, and one associated Boiler Room. Given the significance of aircraft hangars to the operations of a military air field, Hangar No. 6, Hangar No. 7, and the associated Boiler Room are closely associated with the historic context and representative of the significant role of these structures on the home front during World War II. It is the opinion of the consultants that Hangar No. 6, Hangar No. 7, and the Boiler Room were constructed in 1943 and retain a significant level of integrity, making them potentially eligible for the National Register of Historic Places within the proposed district.

The proposed National Register Boundary for the World War II era properties includes the footprint of Hangar No. 6, Hangar No. 7, and the Boiler Room, as well as the portion of Sprankel Avenue separating the Boiler Room from the hangars, because it overlies the utility corridor used to connect these structures. The area defined by this boundary contains approximately 3.85 acres. The proposed boundary does not include the FedEx Admin building, which is assessed for eligibility in the following section.

DESCRIPTION OF PROPOSED FEDEX HISTORIC DISTRICT

The proposed FedEx Historic District was established in the associated Historic Resources Survey. A detailed description of the proposed historic district boundary is included in this evaluation (Figure 11). According to the Historic Resources Survey, the district is potentially eligible for listing on the National Register of Historic Places under Criterion A. The

recommendation of eligibility based on Criterion A under Criteria Consideration G is based on the association of the Section 4(f) properties in the proposed district with the early years of FedEx operations in Memphis and the development of air cargo transportation.

Historic properties are potentially contributing properties to a proposed National Register Historic District if they are associated with the historic theme or events used to define the district and date to the period of significance. The contributing properties of the proposed FedEx Historic District included the Administration Building, two World War II military aircraft hangars, and one associated Boiler Room. It is the opinion of the consultants that the corporate headquarters and operations facility created by the construction of the Administration Building connecting Hangar No. 6 and Hangar No. 7, and the associated Boiler Room retain integrity and are significant based on the association of these buildings with the extraordinary growth of FedEx and its impact on local and national economies, as well as international business. The exceptional importance of the Section 4(f) properties is demonstrated by the fact that there are no other known properties representative of early FedEx operations in the community, state, or nation.

The proposed National Register District Boundary for the FedEx era properties contains approximately 4.3 acres. The district as defined by this boundary includes the footprint of the Administration Building, Hangar No. 6, Hangar No. 7, and the Boiler Room, as well as the portion of Sprankel Avenue separating the Boiler Room from the hangars and Administration Building, because it overlies the utility corridor used to connect these structures.

EFFECTS TO THE PROPOSED MEMPHIS AIR FIELD AND FEDEX HISTORIC DISTRICTS

FedEx has initiated a program to update and modernize its facilities at the Memphis International Airport (MEM) in Memphis, Tennessee. An outdated package sorting facility would be replaced with facilities specifically designed to accommodate modernized equipment and improve efficiency at the Hub.

Under the Proposed Development Action, FedEx would deconstruct or demolish four Section 4(f) properties at MEM and construct several new facilities. The Section 4(f) properties to be demolished or deconstructed are:

1. Hangar #6 (Building 2879)
2. Hangar #7 (Building 2837)
3. Admin (Building 2861)
4. Building 2838

After demolition of the buildings listed above and removal of the associated slabs, FedEx would construct several new facilities and improve existing facilities in order to modernize equipment and improve efficiency.

Once the Secondary 25 and Bulk Truck Load facilities and sort systems are fully operational, FedEx would deconstruct/demolish Bays 1-4 of the North Secondary Sort (2899) facility down to

slab level. The structures that would be demolished or deconstructed, and the proposed newly constructed structures are shown on Figure 2.

DOCUMENTATION OF EFFECT

The consultants applied the criteria of effect as found in 36 CFR Part 800.5 for the proposed project to the potentially eligible properties within the project area. There are two different potential eligibility determinations addressed in this survey. One includes only the World War II era buildings based on Criteria A and C. The other includes the buildings associated with early FedEx operations in the project area based on Criterion A under Criteria Consideration G. Since the footprints of each of these potential districts as defined in the previous section are nearly identical, this documentation of effects will address both districts in the same discussion. The proposed project as currently defined would require the demolition of the potentially eligible properties in the proposed Memphis Army Air Field historic district and the proposed FedEx historic district to enable the construction of a new Secondary Sort 25 facility. Because the proposed FedEx Transformation project would alter characteristics of the historic properties that qualify or render them potentially eligible for the National Register of Historic Places. It is the opinion of the consultants that the proposed project would have an adverse effect on the potentially eligible properties addressed in this Section 4(f) evaluation.

Section 106

36 CFR Part 800.5 Assessment of Adverse Effects

(a) Apply Criteria of Adverse Effect

> *In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties, the Agency official shall apply the criteria of adverse effect to historic properties within the area of potential effects. The Agency Official shall consider any views concerning such effects, which have been provided by consulting parties and the public.*
>
> *(1) Criteria of Adverse Effect*
>
> > *An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.*

(2) Examples of Adverse Effects

An undertaking is considered to have an Adverse Effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

The historic resources contained in the potential Memphis Army Air Field historic district are potentially eligible for listing in the National Register of Historic Places based on Criterion A due to their association with the historic context of World War II era sites in Tennessee and the nation's wartime aviation history and remain clear representations of the significant role of these structures on the home front during World War II. These resources are also potentially eligible under Criterion C due to their unique, asymmetrical design and the rarity of extant wood bow truss hangars in the United States. The historic resources contained in the potential FedEx historic district are potentially eligible for listing in the National Register based on Criterion A under Criteria Consideration G. This recommendation is based on the association of these properties with the exponential growth of FedEx and its impact on local and national economies, as well as international business. The exceptional importance of these properties is demonstrated by the fact that there are no other known properties representative of early FedEx operations in the community, state, or nation. Since the proposed project would result in the demolition of all historic properties in each of the potential districts, it is the opinion of the consultants that the proposed project would constitute an adverse effect to the historic properties.

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR Part 68) and applicable guidelines;

The proposed project would require the demolition of the historic properties in each of the proposed historic districts. Because the proposed project would alter the historic properties in a way that is inconsistent with the *Secretary of the Interior's Standards for the Treatment of Historic Properties,* the proposed undertaking would constitute an adverse effect.

(iii) Removal of the property from its historic location

The proposed project would result in the removal of the property from its historic location through demolition and therefore the proposed undertaking would constitute an adverse effect.

(iv) Change of the character of the property's use or physical features within the property's setting that contribute to its historic significance;

The proposed project would result in significant alteration to the physical features and setting of properties within the APE through demolition, and therefore it is the opinion of the consultants that the proposed undertaking would constitute an adverse effect.

(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;

The proposed undertaking would result in the introduction of visual, atmospheric, or audible elements that would diminish the integrity of the property's significant features through the process of demolition. Therefore, it is the opinion of the consultants that the proposed undertaking would constitute an adverse effect to visual, atmospheric, or audible elements within the APE.

(vi) Neglect of a property which causes its deterioration, except where such neglect or deterioration are recognized qualities or a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

The proposed undertaking would not cause neglect and deterioration of the properties within the APE due to the process of demolition. Therefore, it is the opinion of the consultants that the proposed undertaking would not constitute an adverse effect related specifically to the neglect or deterioration of historic properties within the APE.

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The proposed undertaking would not result in the transfer, lease, or sale of the property or remove it from Federal control. Therefore, it is the opinion of the consultants that the proposed undertaking would not have an adverse effect related to ownership or control of the potentially eligible properties within the APE.

APPLICABILITY OF SECTION 4(F) EVALUATION

FedEx initiated a project to update and modernize its facilities at the Memphis International Airport (MEM) in Memphis, Tennessee. The purpose and need of the project is to replace an outdated and operationally inadequate package sorting facility with modernized facilities and equipment in order to increase efficiency at the Hub. After demolition of 23 of the buildings and removal of the associated slabs, FedEx would construct several new facilities and improve existing facilities in order to modernize equipment and improve efficiency. Once the Secondary 25 and Bulk Truck Load facilities and sort systems are fully operational, FedEx would deconstruct/demolish the final building down to slab level. This demolition of four Section 4(f) properties from within the proposed National Register Historic District bounded property constitutes a Section 4(f) "use" of an historic property. This type of use involves the permanent incorporation of the Section 4(f) properties as part of a transportation project. As a result, the proposed project will require a Section 4(f) evaluation.

There are five existing Nationwide Programmatic Section 4(f) evaluations that can be used in place of individual evaluations for particular types of transportation projects and specific uses. The benefit of using a programmatic evaluation is that it reduces the amount of time necessary to complete the Section 4(f) process. An individual evaluation requires a draft, a comment or circulation period, and final draft. This is because the framework and basic approach of individual evaluations have not previously been circulated and agreed upon by the US Department of the Interior (DOI) in a manner similar to programmatic evaluations. Programmatic evaluations are usually approved much faster than individual evaluations. It is the opinion of the consultants that the proposed project does not meet the requirements necessary to use an existing Nationwide Programmatic Section 4(f) evaluation. As a result, the following documentation is structured according to the requirements of the individual evaluation process. Those criteria are as follows:

INDIVIDUAL EVALUATION

Regardless of whether the Section 4(f) evaluation is processed independently or as a subsection of a NEPA document, the project sponsor must submit a draft that (1) identifies and evaluates avoidance alternatives and (2) identifies and evaluates measures to minimize harm to the Section 4(f) property. This Section 4(f) evaluation fulfills these requirements in the following sections.

ALTERNATIVES AND MITIGATION

In order to comply with regulations of Section 4(f), FedEx considered four alternatives to avoid impacting Section 4(f) properties located in the APE, including a no-build alternative and three alternate locations. Since the alternatives do not appear to be prudent and feasible, the consultant has also worked to mitigate the impact that the proposed project would have on the Section 4(f) properties. The proposed alternatives and mitigation are outlined below.

AVOIDANCE ALTERNATIVE #1:

In order to minimize adverse effects to potentially eligible historic structures, a no-build alternative was investigated (Figure 3). This alternative does not appear to be feasible or prudent, because it would require FedEx to continue to operate in an outdated and inadequate sort facility. This facility was designed and implemented over a 44-year period, and it is no longer able to adapt to advancements in technology and sort systems, which have improved significantly in the last four decades. The facility must be replaced in order to maintain operations at the Memphis Hub well into the future. In addition, FedEx must maintain operations in the existing secondary sort building until a replacement facility is constructed and operational. The no-build alternative would also require the following actions, which would result in additional construction and operational costs of an extraordinary magnitude:

- The overall layout of the Hub would have to be redesigned;
- Other areas would have to be repurposed or moved;
- Traffic flows would be disrupted and need to be redesigned;
- "Sunk costs" in previously developed facilities would be lost; or
- FedEx would have to abandon the proposed project at Memphis and invest in modernization and upgrades at one of its other U.S. hubs, which would have a severe adverse economic impact on the Memphis metropolitan area, causing severe disruption to established communities that depend on the FedEx Hub for employment, as well as businesses who in many cases have invested heavily in facilities in Memphis to be located near the Hub.

AVOIDANCE ALTERNATIVE #2:

In order to minimize adverse effects to potentially eligible historic structures, alternate locations for the Secondary 25 sort facility west, south, and east of the existing sort facility were investigated (Figure 4). These alternate locations did not appear to be feasible or prudent for the following reasons:

- Each is currently used for aircraft staging, fueling, and loading. As such, there are specially engineered and constructed gates, ramps, and fueling equipment to support these operations. Altering these facilities would result in additional construction and operational costs of an extraordinary magnitude.

- Due to their position relative to the existing sort facility and cargo intake area, each of the alternative locations would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need and would result in unacceptable operational problems. The primary objective of this project is to replace outdated facilities and equipment, which will improve the efficiency of the facility in receiving and processing packages. It is essential to the overall project goals

that the new Bulk Truck Load area and associated sort facility align with the operational flow of the existing primary sort and Hub. The location of the Secondary 25 sort facility west, south, or east of the existing sort facility would not accomplish this goal.

AVOIDANCE ALTERNATIVE #3:

In order to minimize adverse effects to potentially eligible historic structures, alternate locations for the Bulk Truck Load area and Secondary 25 sort facility were investigated north of Sprankel Avenue (Figure 5). In this design scheme, the Bulk Truck Load area would be located in the area currently occupied by the vacant Southwide buildings, and the sort facility would be located in the area of the vacant TANG structures. This alternative does not appear to be feasible or prudent, because the area is not large enough to accommodate the truck traffic, staging, and loading facilities, as well as a safe and operationally sound sort facility for the following reasons:

- Based on the design criteria of the Secondary 25 sort facility, the necessary square footage and proportions of the building footprint for the proposed facility would exceed the space available in the area of the existing TANG buildings. In order to construct a sort facility in this location, FedEx would need to relocate the existing Bulk Truck Load area to the area currently occupied by the Southwide Center buildings, which would reduce or nearly eliminate the current truck and tractor-trailer access and staging areas necessary to utilize the Bulk Truck Load areas and deliver packages to the sort facility. This location would also leave no remaining space to construct the new BTL facility. This alternative would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need and would result in unacceptable operational problems.

- It would also pose a safety hazard by limiting the maneuverability of delivery trucks and tractor-trailers when cornering and turning around on site. By constructing a new Bulk Truck Load area in the vicinity of the existing Southwide Center buildings without expanding the associated access and staging areas, the access roads would be over utilized, causing traffic congestion that would limit the effectiveness of the new Bulk Truck Load area and Secondary 25 sort facility to the extent that the project would not be financially viable. This alternative would result in additional construction and operational costs of an extraordinary magnitude.

- This location would also be operationally unsound, because it would separate the Secondary 25 sort facility on the opposite side of Sprankel Avenue. In order for the sort equipment and assembly line to meet operational requirements, the new sort facility must be located adjacent to the existing sort facility and contiguous with the cargo intake area. This alternative would it would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need and result in unacceptable operational problems.

AVOIDANCE ALTERNATIVE #4:

In order to minimize the adverse effects to potentially eligible historic structures, an alternate location for the Bulk Truck Load area and Secondary 25 sort facility was investigated north of Democrat Road and south of Nonconnah Creek in an area currently used for employee parking (Figure 6). This area is located across a large public road outside of the perimeter of the secure airport facility. This design scheme does not appear to be feasible or prudent for the following reasons:

- Based on the design criteria of the Secondary 25 sort facility, the necessary square footage and proportions of the building footprint for the proposed facility would exceed the space available in the area of the existing employee parking area. In order to construct a sort facility in this location, FedEx would need to expand beyond the area of the existing parking lot, which is problematic, as it is bounded on the north and east by Nonconnah and Hurricane Creeks. As a result, this alternative would compromise the project to a degree that it is unreasonable to proceed with the project in light of its stated purpose and need and would result in unacceptable operational problems.

- By locating the Bulk Truck Load and Secondary 25 sort facility outside of the Level 1 Security portion of the airport facility, all packages and personnel transferred to this unsecured Bulk Truck Load and Secondary 25 sort facility would need to be processed through security screening when both exiting and entering the Level 1 secure zone. Statistically, each time a person or object leaves and returns to the secure area, there is an opportunity for a security failure. This would be operationally unsound and would reduce the effectiveness of the new Bulk Truck Load area and Secondary 25 sort facility to the extent that the project would not be operationally or financially viable. In order to incorporate this area into the Level 1 Security portion of the airport facility, the following actions would need to occur:

    1. The airport would need to exercise eminent domain to incorporate a minimum of 0.5 mile of Democrat Road, which is a 4-lane road with a center turning lane that provides access from this area to the adjacent interstate highway, into the Level 1 Security area.
    2. Relocation of Democrat Road around the north side of the new Bulk Truck Load area and Secondary 25 sort facility, which is unlikely to be approved given the potential impact to Nonconnah and Hurricane Creeks.
    3. This location would also be operationally unsound, because it would separate the Secondary 25 sort facility on the opposite side of Sprankel Avenue. In order for the sort equipment and assembly line to meet operational requirements, the new sort facility must be located adjacent to the existing sort facility and contiguous with the cargo intake area.

MEASURES TO AVOID, MINIMIZE OR MITIGATE HARM

The Section 4(f) properties located within the boundaries of the proposed Memphis Army Air Field Historic District and proposed FedEx Historic District would be adversely affected if the proposed project is constructed. The undertaking would adversely affect the property and would constitute a permanent incorporation of these structures into the site of the Secondary 25 sort facility. In an effort to avoid, minimize, or mitigate the impact of proposed project to the historic property, and to follow the requirements of Section 4(f) of the U.S. Department of Transportation Act of 1966, as amended, and Section 106 of the National Historic Preservation Act of 1966, as amended, FedEx has designed the alternatives in a manner intended to avoid or minimize impacts to the historic property within the project area.

Due to the potential lack of prudent alternatives to the proposed facility improvements, FedEx seeks approval to mitigate the adverse effects to the potentially eligible structures caused by their demolition through the completion of Historic American Buildings Survey (HABS) Level II documentation of the eligible structures in accordance with the U.S. Army Corps of Engineers recommendations for military aircraft hangars and supporting structures. In a report documenting a national survey and assessment of historic military aircraft hangars, Webster argues that the significance of a particular hangar "may rest on the fact that it is the earliest, best or last existing example of a type."[5] She continues to state that "it may be feasible and justifiable to use documentation of the nation's best example of a hangar type to represent the remaining examples for purposes of mitigation."[6] In conclusion, Webster also recommended that the "best surviving example of each major aircraft hangar type on U.S. military installations be identified… and that these prime examples then be documented according to the Level II protocols specified by the Historic American Buildings Survey (HABS)." Given that this research did not identify any other hangars with a similar asymmetrical floor plan or truss column construction as Hangar No. 6 (2879) and Hangar No. 7 (2837), it is reasonable to suggest that Webster's recommendations are considered prior to the demolition of these structures.[7]

If the Admin building is also determined to be eligible due to its association with early FedEx history, a similar mitigation plan is proposed to mitigate the adverse effect caused by its demolition.

COORDINATION

[5] Julie L. Webster, *Historical and Architectural Overview of Military Aircraft Hangars: A General, History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations* (Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999), 7-1.
[6] Webster, 7-2.
[7] Jayne Aaron. *Historical and Architectural Overview of Aircraft Hangars of the Reserves and National Guard Installations from World War I through the Cold War.* (Air Force Air Combat Command, 2011).

The coordination section of this evaluation reflects the outcomes of the discussions involving avoidance alternatives, impacts to Section 4(f) properties, and mitigation measures, as well as a discussion of significance and use of the Section 4(f) properties. As of the date of this draft Section 4(f) evaluation, the FAA has consulted with the TN-SHPO, which is the official with jurisdiction (OWJ) for the proposed undertaking. A record of previous correspondence has been included in the SHPO Correspondence section. Revisions have been incorporated into this draft Section 4(f) evaluation based on previous coordination and consultation.

In order to meet the requirements for coordination under Section 4(f), this draft evaluation should be made available to the OWJ, the DOI, and the other appropriate parties listed for coordination and comment for a period of 45 days. If comments are not received within 15 days of the comment deadline, a lack of objection may be assumed and the process may proceed to a Final Evaluation.

CONCLUSIONS

Based upon the above considerations, there is potentially no feasible and prudent alternative to the use of the Section 4(f) properties located in the APE of the proposed undertaking and the proposed action includes all possible planning to minimize harm to the Section 4(f) properties resulting from such use.

BIBLIOGRAPHY

Aaron, Jayne. Historical and Architectural Overview of Aircraft Hangars of the Reserves and National Guard Installations from World War I through the Cold War. Air Force Air Combat Command, 2011.

Webster, Julie L. Historical and Architectural Overview of Military Aircraft Hangars: A General History, Thematic Typology, and Inventory of Aircraft Hangars Constructed on Department of Defense Installations. Champaign, Illinois: United States Army Construction Engineering Research Laboratory, 1999.

FIGURES

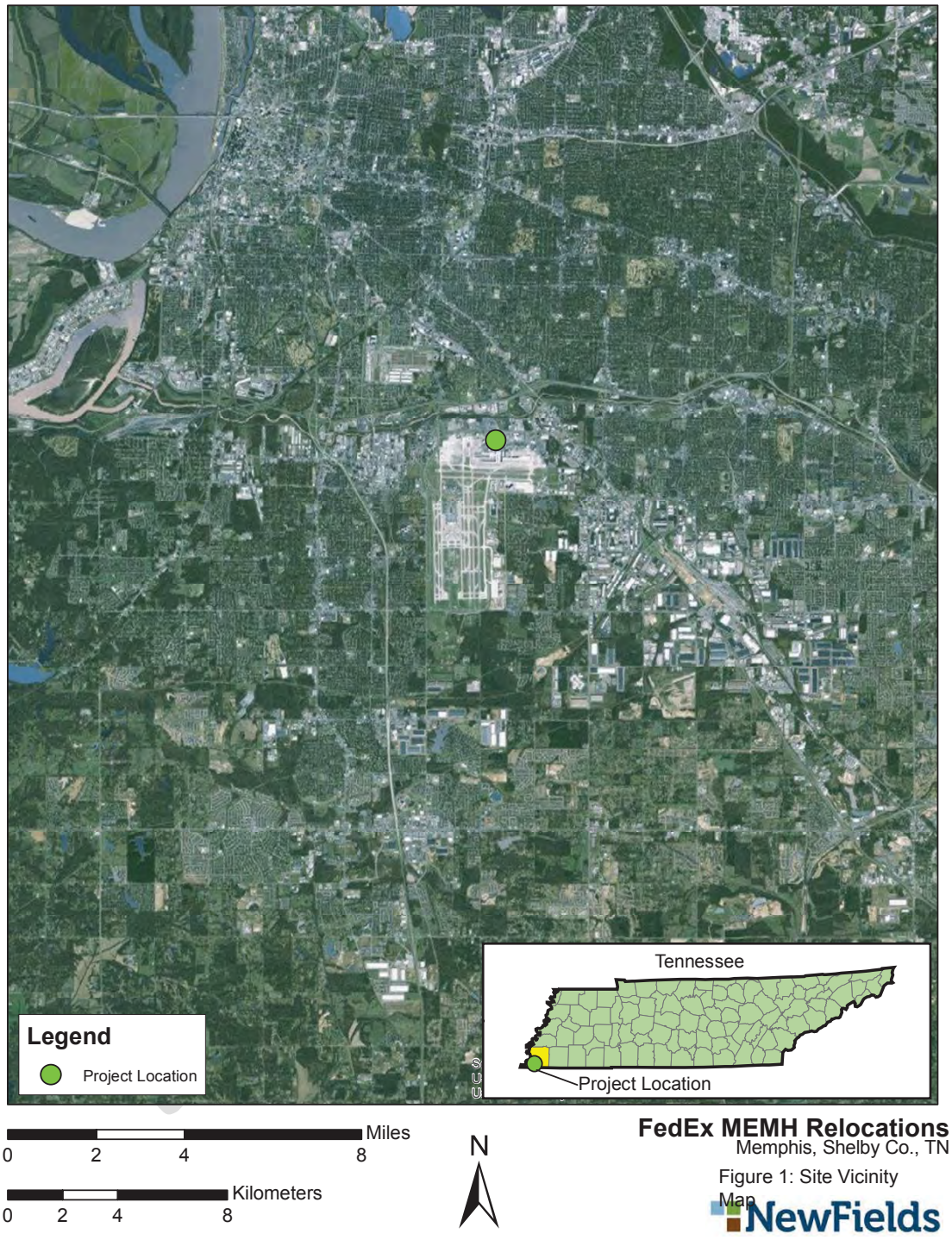


Figure 1: Site Vicinity Map.

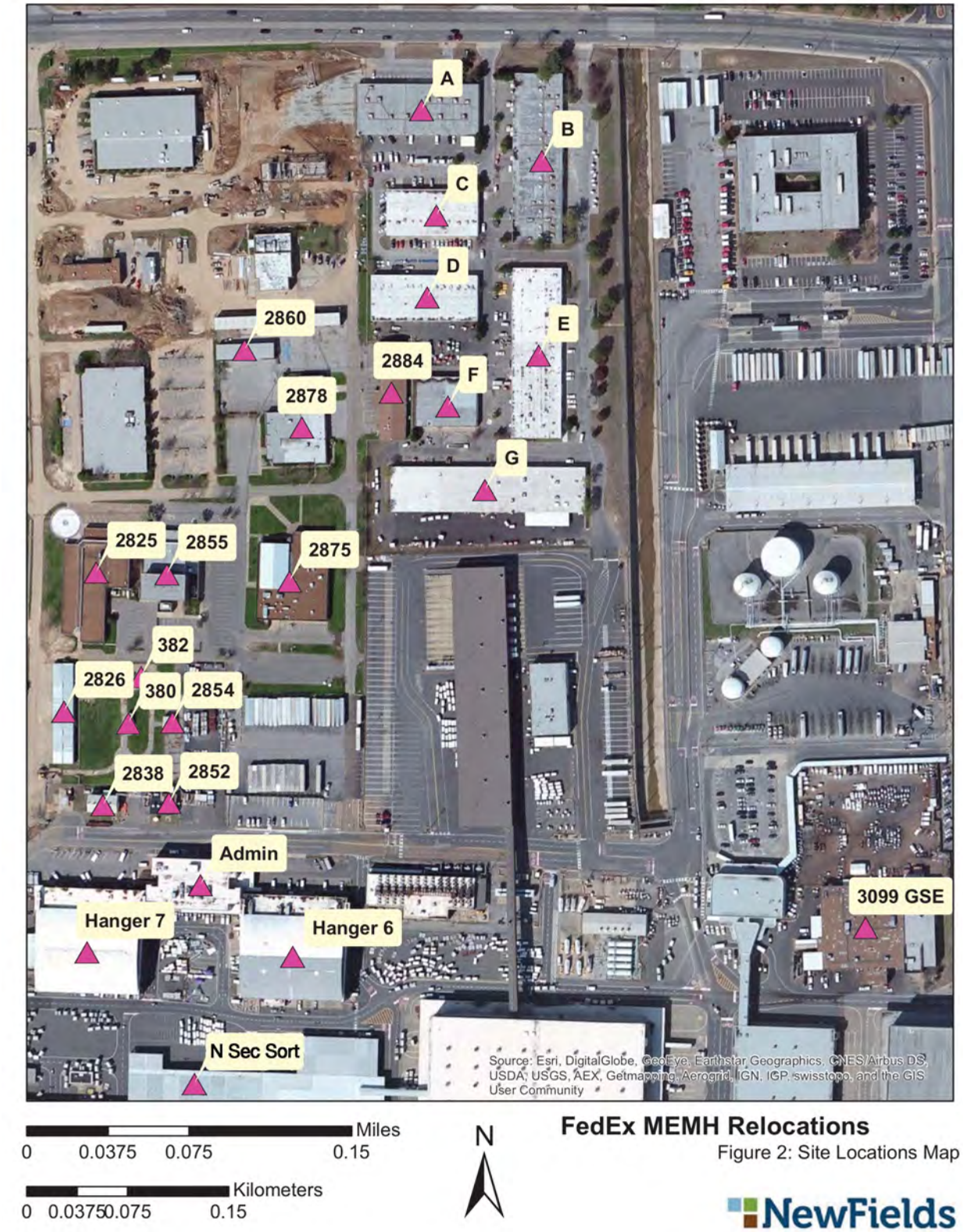


Figure 2: Site Locations Map.

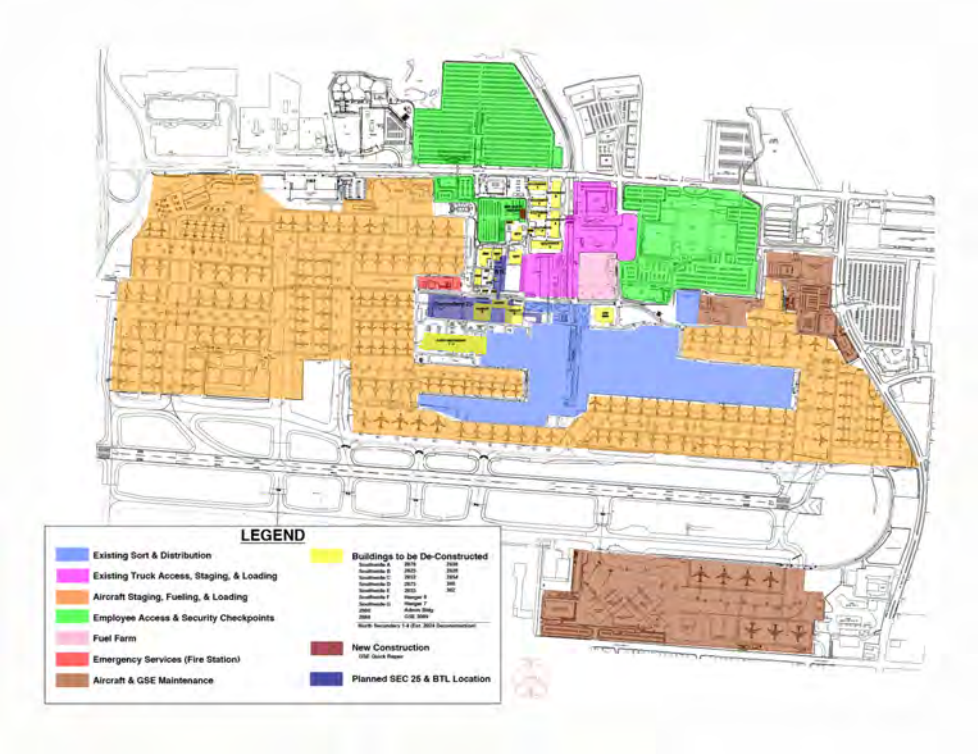


Figure 3: FedEx Ramp Plan map to illustrate Avoidance Alternative #1.

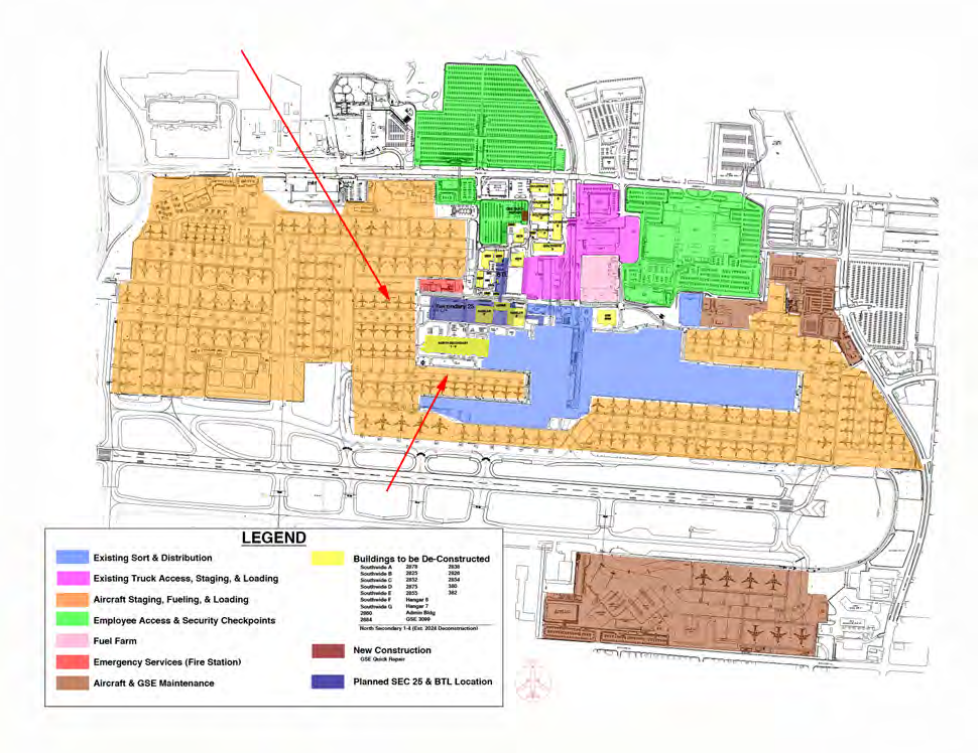


Figure 4: FedEx Ramp Plan depicting the location of Avoidance Alternative #2.

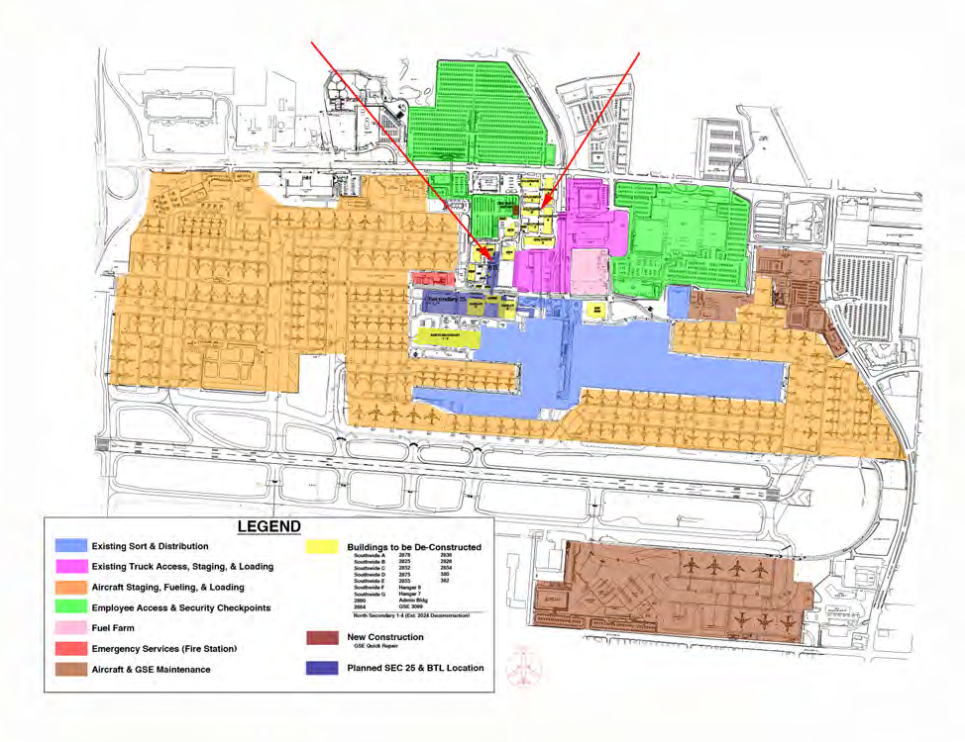


Figure 5: FedEx Ramp Plan depicting the location of Avoidance Alternative #3.

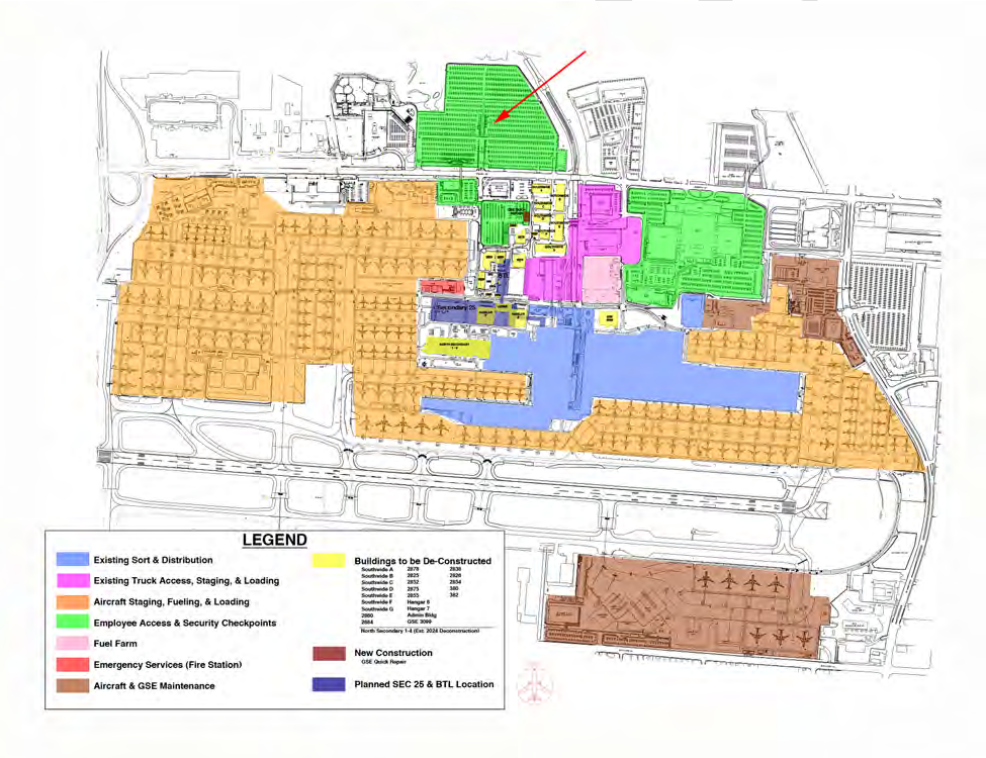


Figure 6: FedEx Ramp Plan depicting the location of Avoidance Alternative #4.

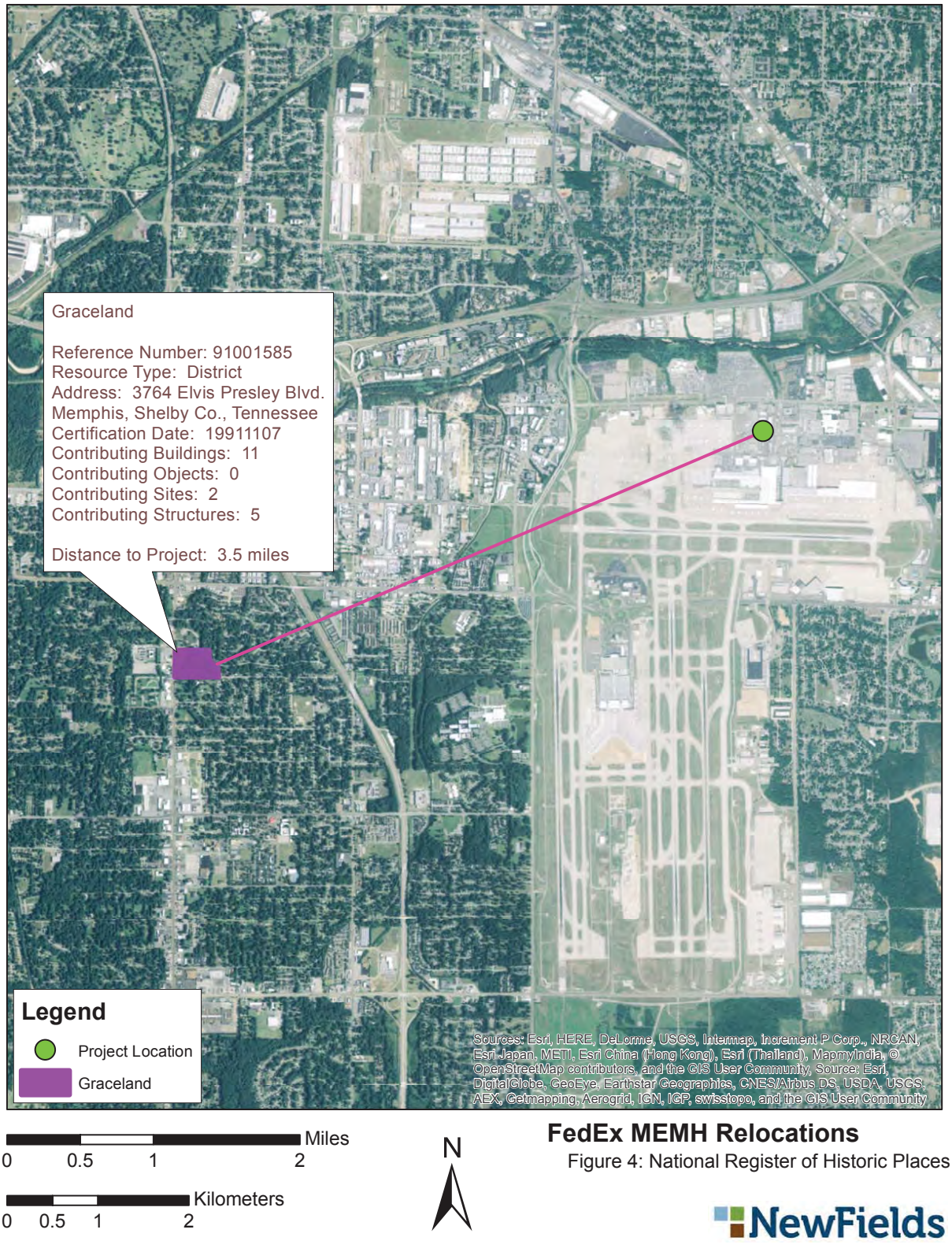


Figure 7: National Register of Historic Places Map.

Figure 8: TN-SHPO survey map and aerial view depicting the locations of three properties identified by TDOT historians. The two circa 1950 single-family residences are indicated in green and the 1958 commercial building east if the airport is indicated in yellow.

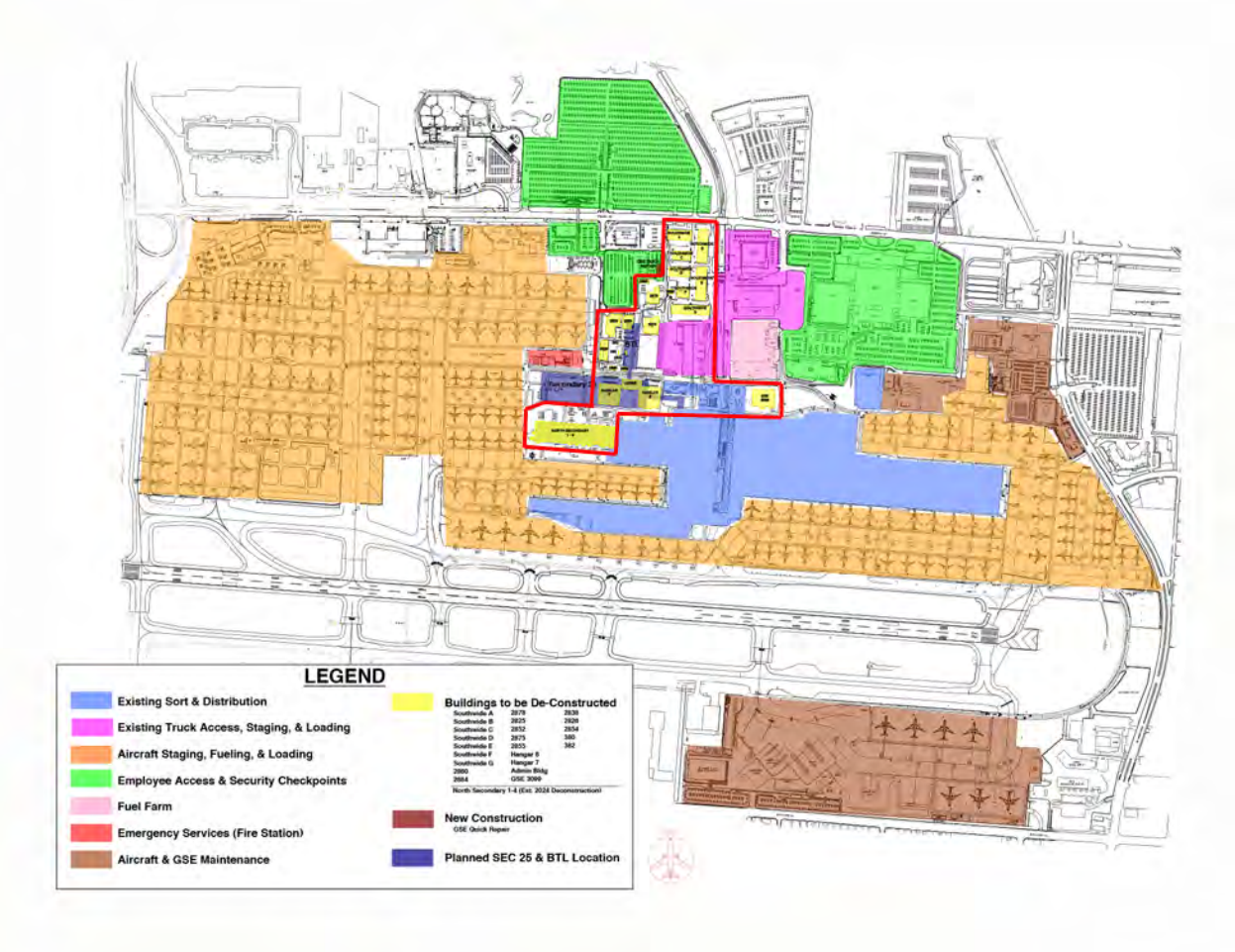


Figure 9: FedEx Ramp Plan depicting the location and boundary of the APE (depicted with a red outline).

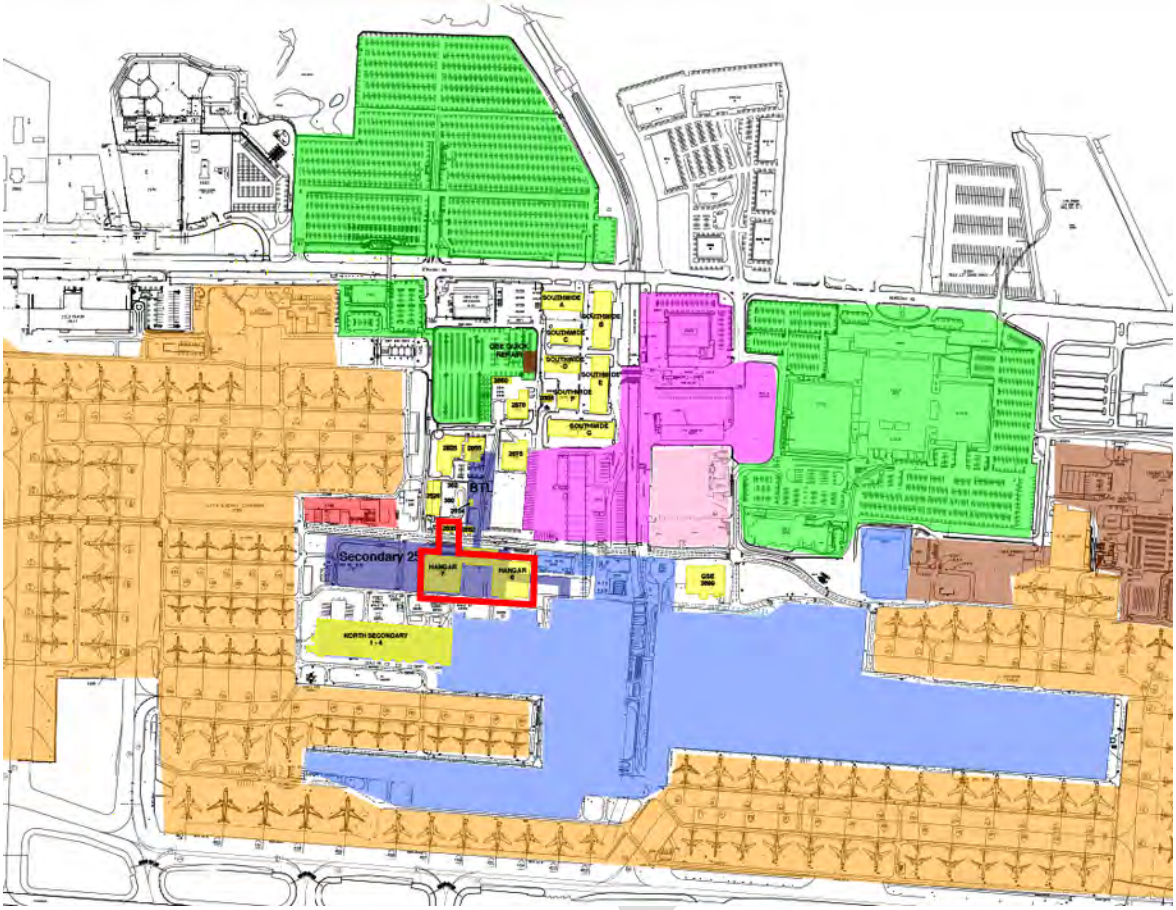


Figure 10: FedEx Ramp Plan depicting (with red outline) the location and boundary of the proposed Memphis Army Air Field Historic District.

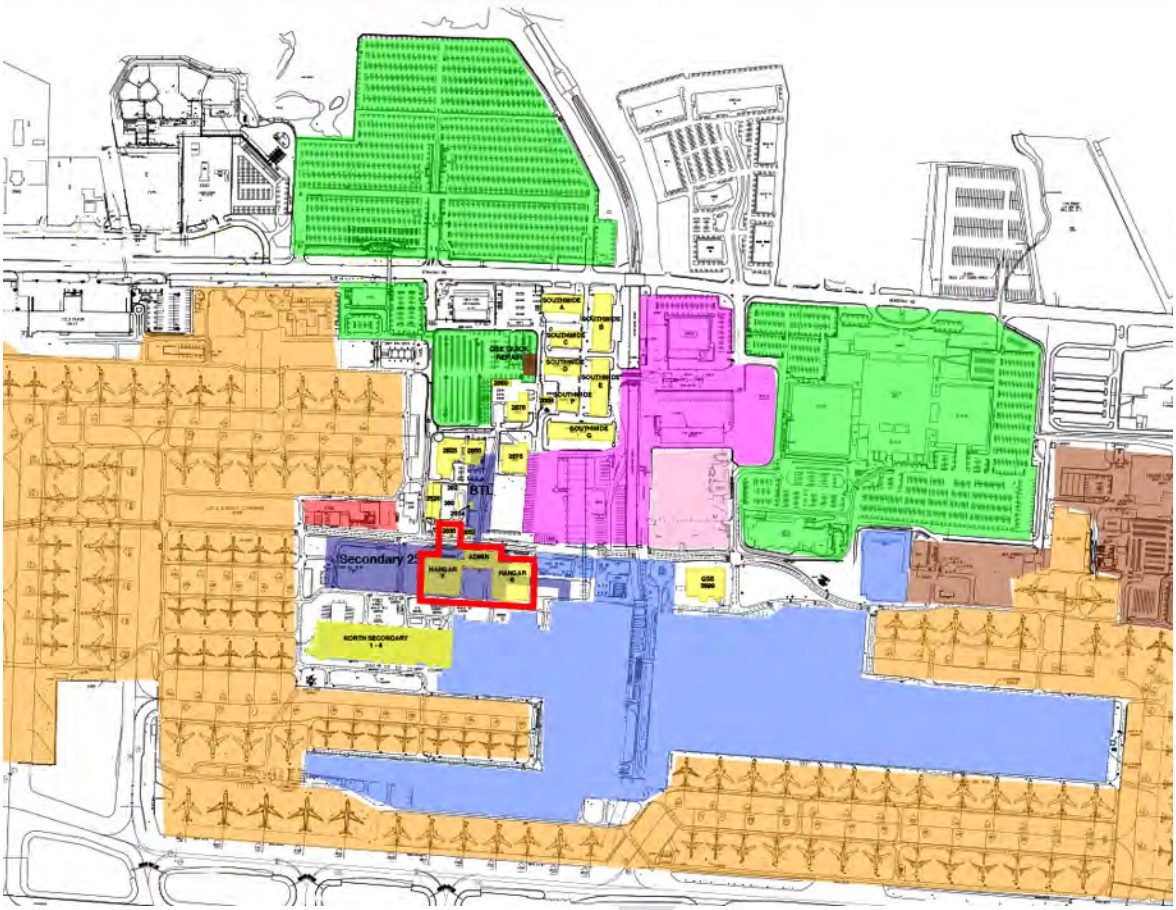


Figure 11: FedEx Ramp Plan depicting (with red outline) the location and boundary of the proposed FedEx Historic District.

ATTACHMENTS

Section 106 Review, National Historic Preservation Act of 1966

Eligibility Criteria of the National Register of Historic Places

National Register of Historic Places, TDOT Summary Sheet

Criteria of Adverse Effects, Codified at 36 CFR Part 800.5

Section 4 (f), TDOT Act Of 1966, TDOT Summary Sheet

ATTACHMENT 1: SECTION 106 REVIEW, NATIONAL HISTORIC PRESERVATION ACT OF 1966

Section 106 of the ***National Historic Preservation Act*** requires that Federal agencies consider what effects their actions and/or actions they may assist, permit, or license, may have on historic properties, and that they give ***the Advisory Council on Historic Preservation (Council)*** a "reasonable opportunity to comment" on such actions. The Council is an independent Federal agency. Its role in the review of actions under Section 106 is to encourage agencies to consider, and where feasible, adopt measures that will preserve historic properties that would otherwise be damaged or destroyed. The Council's regulations, entitled "Protection of Historic Properties" (36 CFR Part 800) govern the Section 106 process. The Council does not have the authority to require agencies to halt or abandon projects that will affect historic properties.

Section 106 applies to properties that have been listed in the ***National Register of Historic Places (NRHP)***, properties that have been determined to be eligible for inclusion in the NRHP, and properties that may be eligible but have not yet been evaluated. If a property has not yet been nominated to the NRHP or determined eligible for inclusion, it is the responsibility of the Federal agency involved to ascertain its eligibility.

The Council's regulations are set forth in a process consisting of four basic steps which are as follows:

1. Initiate Section 106 Process: The Federal agency responsible for the action establishes the undertaking, determines whether the undertaking has the potential to affect historic properties (i.e., properties listed in or eligible for listing in the National Register of Historic Places), and identifies the appropriate State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO). At this time, the agency plans to involve the public and identify other consulting parties.
2. Identify Historic Properties: If the agency's undertaking has the potential to affect historic properties, the agency determines the scope of appropriate identification efforts and proceeds to identify historic properties within the area of potential effects. Identification involves assessing the adequacy of existing survey data, inventories, and other information on the area's historic properties. This process may also include conducting further studies as necessary and consulting with the SHPO/THPO, consulting parties, local governments, and other interested parties. If properties are discovered that may be eligible for the National Register, but have not been listed or determined eligible for listing, the agency consults with the SHPO/THPO and, if needed, the Keeper of the National Register to determine the eligibility status of the property.
3. Assess Adverse Effects: The agency, in consultation with the SHPO/THPO, assesses the potential effects to historic properties affected by the undertaking. The agency at this time will determine that the action will have "no adverse effect" or an "adverse effect" on historic properties. Consulting parties and interested members of the public are informed of these findings.
4. The regulations provide specific criteria for determining whether an action will have an effect, and whether that effect will be adverse. Generally, if the action may alter the

characteristics that make a property eligible for the National Register, it is recognized that the undertaking will have an effect. If those alterations may be detrimental to the property's characteristics, including relevant qualities of the property's environment or use, the effects are recognized as "adverse."

5. Resolve Adverse Effects: The agency consults with the SHPO/THPO and others, including consulting parties and members of the public. The Council may choose to participate in consultation, particularly under circumstances where there are substantial impacts to historic properties, when a case presents important questions about interpretation, or if there is the potential for procedural problems. Consultation usually results in a Memorandum of Agreement (MOA).

If agreement cannot be reached, the agency, SHPO/THPO, or Council may terminate consultation. If the SHPO/THPO terminates consultation, the agency and the Council may conclude the MOA without SHPO/THPO involvement. If the SHPO/THPO terminates consultation and the undertaking is on or affecting historic properties on tribal lands, the Council must provide formal comments. The agency must request Council comments if no agreement can be reached.

ATTACHMENT 2: ELIGIBILITY CRITERIA OF THE NATIONAL REGISTER OF HISTORIC PLACES

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- **CRITERION A**. that are associated with events that have made a significant contribution to the broad patterns of our history (history); or
- **CRITERION B**. that are associated with the lives of persons significant in our past (person); or
- **CRITERION C**. that embody the distinctive characteristic of a type, period, or method of construction or that represent the work of a master, or that possess high artistic values, or that components may lack individual distinction (architecture); or
- **CRITERION D**. that have yielded, or may be likely to yield, information important in prehistory or history (archaeology).

Ordinarily, cemeteries; birthplaces or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years are not considered eligible for the National Register of Historic Places; however, such properties will qualify if they are integral parts of historic districts that do meet the criteria or if they fall within the following categories:

- **EXCEPTION A**. a religious property deriving primary significance from architectural or artistic distinction or historical importance; or
- **EXCEPTION B**. a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- **EXCEPTION C**. a birthplace or grave of a historical figure of outstanding importance if there is no other appropriate site or building directly associated with his productive life; or
- **EXCEPTION D**. a cemetery which derives its primary significance from graves or persons of transcendent importance, from age, from distinctive design features, or from association with historic events; or
- **EXCEPTION E**. a reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived; or
- **EXCEPTION F**. a property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own historical significance; or
- **EXCEPTION G**. a property achieving significance within the past 50 years if it is of exceptional importance.

ATTACHMENT 3: TDOT NATIONAL REGISTER OF HISTORIC PLACES SUMMARY SHEET

What is the National Register of Historic Places?

The National Register, maintained by the Keeper of the Register within the National Park Service, Department of the Interior, is the nation's official list of districts, buildings, sites, structures, and objects significant in American history, architecture, archeology, engineering, and culture.

What are the benefits and restrictions of listing?

In addition to honorific recognition, listing in the National Register results in the following benefits for historic properties:

- Section 106 provides for consideration of National Register listed or eligible properties in planning for Federal, federally licensed, and federally assisted projects;
- Eligibility for certain tax provisions for the certified rehabilitation of income-producing National Register structures such as commercial, industrial, or rental residential buildings;
- Consideration of historic values in the decision to issue a surface mining permit where coal is located in accordance with the Surface Mining Control Act of 1977; and
- Qualification of Federal grants for historic preservation, when funds are available.

Does National Register designation place any additional burdens or obligations on the property owner?

Owners of private property listed in the National Register are free to maintain, manage, or dispose of their property as they choose, provided that no Federal moneys are involved.

How is a property nominated to the National Register?

The first step is for the owner to contact the Tennessee State Historic Preservation Office (TN-SHPO), Clover Bottom Mansion, 2941 Lebanon Road, Nashville, TN 37243-0442; 615-532-1558. Ordinarily, private individuals (or paid consultants) prepare nomination forms. The TN-SHPO submits these nominations to a State Review Board, which meets three times a year. This body reviews the nominations and votes to recommend or deny National Register listing. If approved, the TN-SHPO submits the nomination to the Keeper of the Register in Washington, D.C. for consideration for listing. The Keeper's Office has 45 days to review the nomination, and its decision regarding National Register listing is final.

How long does the nomination process take?

The process varies but typically takes between eight and twelve months.

ATTACHMENT 4: CRITERIA OF ADVERSE EFFECT

Regulations codified at 36 CFR Part 800 require Federal agencies to assess their impacts to historic resources. The regulations provide specific criteria for determining whether an action will have an effect, and whether that effect will be adverse. These criteria are given below.

36 CFR Part 800.5 Assessment of Adverse Effects

(a) *Apply Criteria of Adverse Effect*. In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties, the Agency Official shall apply the criteria of adverse effect to historic properties within the area of potential effects. The Agency Official shall consider any views concerning such effects, which have been provided by consulting parties and the public.

(1) Criteria of adverse effect. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

(2) *Examples of adverse effects.* Adverse effects on historic properties include, but are not limited to:

(i) Physical destruction of or damage to all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access that is not consistent with the Secretary's Standards for the Treatment of Historic Properties and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

ATTACHMENT 5: TDOT SECTION 4(F) SUMMARY SHEET

WHAT IS SECTION 4 (f)? Codified at 49 CFR Part 303, "Section 4 (f)" refers to a section of the U.S. Department of Transportation Act which gives special consideration to the use of park and recreation lands, wildlife and waterfowl refuges, and historic sites by Federally assisted transportation projects. Section 4 (f) applies only to those projects using funds from the U.S. Department of Transportation. The law states:

(c) The Secretary may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if -

> *(1) there is no prudent or feasible alternative to using that land; and*
>
> *(2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use.*

WHAT IS THE SECTION 4 (f) PROCESS FOR HISTORIC PROPERTIES? To be considered "historic," a property must either be listed in the National Register of Historic Places or be determined eligible for such listing by the Keeper of the Register or the State Historic Preservation Officer (SHPO).

On any project, the primary objective is to develop a design that does not have Section 4(f) involvement. If such a design is not possible, then the Section 4 (f) documentation is prepared and circulated. Such documentation is circulated to all appropriate agencies or groups (consistent with the Section 106 process and the National Environmental Policy Act), and as applicable, to the U.S. Department of the Interior, Housing and Urban Development, and Agriculture. It is also circulated to the agency having authority over the Section 4 (f) property. For historic properties, such agencies are the SHPO and the Advisory Council on Historic Preservation (ACHP). After review of any comments received, the final Section 4(f) documentation is sent to the Federal Highway Administration (FHWA) which determines if the requirements of the Section 4(f) statute are met. If the requirements are satisfied, then the FHWA will approve the use of the Section 4 (f) property.

HOW ARE SECTION 4 (f) AND SECTION 106 RELATED? Section 106 is a provision of the National Historic Preservation Act of 1966, which requires all federal agencies to consider the effects of their projects on historic properties and to provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on those effects. The ACHP has promulgated regulations at 36 CFR Part 800 that describe the procedures that agencies must follow in order to comply with Section 106. Many of the Section 106 documentation requirements overlap the Section 4 (f) documentation requirements for historic properties. For this reason, for projects having a 4(f) use of a historic site, the documentation for Section 106 and Section 4 (f) is usually

combined into one document and circulated to the appropriate groups described above. The consent of neither the SHPO nor the ACHP is necessary for FHWA to approve a Section 4 (f) use, but FHWA gives great consideration to comments from these agencies.

SHPO CORRESPONDENCE

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

January 20, 2017

Ms. Kristi Ashley
Memphis Airports District Office
2862 Business Park Drive, Building G
Memphis, TN 38118-1555

RE: FAA / FEDERAL AVIATION ADMINISTRATION, Airport Development Projects, Memphis, SHELBY COUNTY, TN

Dear Ms. Ashley:

We have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. You have submitted documents that are insufficient for us to complete our review. To continue the Tennessee State Historic Preservation Office review of this undertaking, please provide us with the following information:

1. A full architectural survey needs to be conducted including all of the properties over 50 years old within the undertaking's Area of Potential Effects (APE);
2. The above-reference survey should include multiple images of each structure, a site map providing a lay out of the complex, date of construction, style and materials, and historic use and significance of each building. The National Register Multiple Property nomination form should not be used for this type of report;
3. The 2015 component of the property is not eligible under Criterion Consideration G since the passage of time has not been great enough for its significance to be evaluated. We encourage your office to evaluate the entire Fed Ex property for Criterion Consideration G;
4. Should any of the properties within the APE be considered eligible for inclusion in the National Register of Historic Places, a full Section 4(f) analysis that creates avoidance alternatives will be necessary as specified in the U.S. DOT Act of 1966 (now codified at 49 U.S.C. §303);
5. Should there be an adverse effect to a National Register eligible property, your agency should follow 36 CFR 800.6 to resolve adverse effects through consultation.

Upon receipt of this additional documentation, we will continue our review of this undertaking as quickly as possible. Please be advised that until this office has provided you a final written comment on this undertaking, you have not met your Section 106 obligation under federal law. Questions and comments may be directed to David Calease (615) 770-1092. We appreciate your cooperation.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/dlc

TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

May 23, 2017

Ms. Kristi Ashley
Environmental Specialist
FAA, Memphis Airports District Office
2600 Thousand Oaks Blvd., STE 2250
Memphis, TN 38118-2462

RE: FAA / Federal Aviation Administration, FedEx MEMH Relocations, Project #8648976, Memphis, Shelby County, TN

Dear Ms. Ashley,

Our office has reviewed the revised Environmental Assessment. Below are our comments on the revised report.

1. Between this draft and the original draft, our office agrees that the hangers and boiler room are eligible as a complex, although the description between the two drafts should be combined into a clear eligibility assessment with a definitive assessment of eligibility, photos, and a clear National Register boundary map.

2. The document still does not contain the "historic resource survey" mentioned in the first draft or an assessment of the complex as a whole, particularly in reference to FedEx's potential for exceptional significance. The document vaguely mentions potential significance for only Hangar 7 due to Fed Ex's early operations, which should be firmed up with an explanation as to why or why not the other airport properties are not eligible as a Fed Ex complex, because either they do not retain integrity due to alterations or additions, or that they do not reflect the history of Fed Ex. From page 13 of the report:

   > There were two recurring oral histories pertaining to the hangars that should be investigated further. It is possible that Fred Smith's first office in Memphis was located in Hangar 7 and the hangar was used as the first sorting facility. This is certainly plausible given that Hangar 6 was under construction at the time. **If true, Hangar 7 would be potentially significant through its association with early FedEx operations.**

3. Effects to historic resources are defined within the Section 106 regulations available here at http://www.achp.gov/regs-rev04.pdf. The most pertinent regulations are below:

   § 800.5 Assessment of adverse effects

(1) Criteria of adverse effect. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register **in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association**. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register.

(2) Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative. (2) Examples of adverse effects. Adverse effects on historic properties include, but are not limited to: **(i) Physical destruction of or damage to all or part of the property** (ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines; (iii) Removal of the property from its historic location; (iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance; (v) Introduction of visual, atmospheric or audible elements that diminish the integrity of the property's significant historic features; (vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and (vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

Therefore, demolition is not something that can be mitigated into a no adverse effect and thus a de minimis Section 4(f) use.

4. Section 4(f) requires a serious look at avoidance alternatives. At its most basic level a Section 4(f) assessment needs:
    - To clearly define the historic property (the clear eligibility assessment and NR boundaries as mentioned previously).
    - Describe the avoidance alternatives evaluated (example for a road project: 1. Not building road, 2. Move the road to the south away from the historic property, 3. Decrease the cross-section to avoid taking the historic property).
    - Describe why or why not the avoidance alternatives are prudent and feasible.
    - Perhaps one of your avoidance alternatives would **not** be an adverse effect because it avoids demolition through adaptive reuse, renovation, etc.
        - The report would provide a clear description of why it was not adversely affecting the property based on Section 106 regulations.
        - Then the project could be processed as a de minimis Section 4(f) use.
    - If you have justified that your avoidance alternatives are not prudent and feasible, you must choose the one with the least overall harm and show that all possible planning went into avoiding adverse effects to historic resources.
    - Minimization efforts must be evaluated and finally, mitigation measures identified such as, the archival documentation and any other creative measures to mitigate the loss of the historic resources.

A tutorial on Section 4(f) is at the following link. It simply leads through the entire process with the draft and final 4(f) documents: https://www.environment.fhwa.dot.gov/section4f/default.aspx

Thank you for your continued cooperation. If you have any questions please contact Casey Lee at Casey.Lee@tn.gov or 615-253-3163.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/cjl

Appendix E: Hazardous Materials Report

EnviroRem, Inc.

Economical Solutions to Environmental Needs

Limited Environmental Study
NESHAP ACM, Pb, & Waste Streams
For Renovation of
Specified Structures
3131 Democrat
Memphis, Shelby Co, Tennessee

EI Project Number 16-113

May 11, 2016

Prepared for:

FedEx Environmental Engineering
3620 Hacks Cross Road, Bldg. B, 2nd Floor
Memphis, Tennessee 38125

1715 Lochearn Rd. Memphis, TN 38116

901-345-0000 800-456-6766

Table of Contents

1.0 EXECUTIVE SUMMARY

1.1 General Site Information

Project Information:
Specified Structures as noted

Site Information:
3131 Democrat Road
Memphis, Tennessee
Shelby County

Consultant Information:
EnviroRem, Inc.
1715 Lochearn Road
Memphis, Tennessee 38116
Telephone: (901) 345-0000
Fax: (901)345-0015
Inspection Date: April 19-22, 2016
Site Assessor: Will D. Brown

Project Site Contact:

Client Information:
Federal Express Corporation
Mr. Jamal Mansour
3620 Hacks Cross Road, Bldg. B, 2nd Floor
Memphis, Tennessee 38125

Environmental Professional Statement:
I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in § 312.10 part of 40 CFR 312. We have the specific qualifications based on education, training and experience to assess a property of the nature, history and setting of the subject property.

Will D. Brown

_____

Will D. Brown, VP Consulting Services
Environmental Professional
Licensed Asbestos Inspector, Mgmt. Planner, Project Designer
Licensed Lead Inspector, EPA RRP Trainer

2.0 INTRODUCTION TO LIMITED ENVIRONMENTAL STUDY

2.1 Report Purpose

The purpose of this study was to identify *suspect asbestos containing materials* and *asbestos containing materials* (ACM), identify damaged painted surfaces that may constitute a secondary waste stream, generally screen for moisture intrusion sources, and inventory general wastes that may be hazardous materials for disposal purposes. This survey was conducted in general accordance of the NESHAP regulation and to assist in NEPA permitting application.

2.2 Scope of Report

- Limited asbestos screening (LAS) survey consisting of the identification of suspect asbestos containing materials (ACMs) in accessible areas and the collection and laboratory analysis of bulk samples. The scope of the survey was intended to be consistent with the ASTM E 2308-05: *Standard Guide for Limited Asbestos Screens of Buildings*. The LAS was performed to identify the presence of readily accessible suspect ACM and to develop recommendations as to the necessity for more thorough survey and/or an Operations and Maintenance (O&M) program. The LAS attempted to sample each homogeneous area or fully characterize each suspect material. Any untested potential ACM is considered suspect until tested and proven otherwise.
- Identify painted surfaces with finish in "poor" condition that may warrant additional regulatory oversight by NESHAP.
- Generally screen for moisture intrusion sources and visually assess impact.
- Categorize potential waste streams that may constitute a hazardous waste under regulatory definition.

2.3 Notable Assumptions in Report Preparation

A truly randomized sample selection process was not utilized due to selective nature of the proposed demolition scope of work. Samples were collected to refine suspect materials that to date have been unsampled and/or unpublished.

2.4 Limitations and Exceptions of Report

EI, its officers, employees, nor subsidiaries, makes no representation of warranty that the discoverable past or current operations at the property are, or have ever been, in compliance with all applicable federal, state and local codes, regulations and laws. This document does not warrant against any future operations or conditions, nor does it warrant against conditions or operations present of a type or at a location not investigated. Regardless of the conclusions stated in this report, EI is not responsible for consequences or conditions arising from facts not fully disclosed to EI during the investigation.

An independent laboratory provided the analytical data referenced in this report, and is assumed to be correct and accurate unless obviously contradicted by EI conclusions or other credible referenced sources reviewed during the assessment. EI, nor its employees or subsidiaries, shall not be liable for any such firms failure to make relevant files or documents properly available, to properly index files, or otherwise to fairly to maintain or produce accurate or complete records.

The Environmental Professional Statement in Section 1.1 of this report does not certify the findings contained in this report and is not a legal opinion of such *Environmental Professional* (EP). The EP

statement is intended to document EI's opinion that an individual meeting the qualifications of an EP was involved in the performance of the assessment and that the activities performed by, or under the supervision, of, the EP were performed in conformance with the standards and practices set forth in 40 CFR Part 312 per the methodology in ASTM Standard Practice E 1527-13 and the scope of work for this investigation.

Other limitations and exceptions that are specific to the scope of this report may be found in corresponding sections.

2.5 Special Terms, Conditions, & User Reliance

This report is for the use and benefit of, and may be relied upon by Federal Express Corporation, and any of its affiliates, and third parties authorized in writing by client and EnviroRem, including the lender in connection with a secured financing of the property, and their successive assignees. Any downstream user of this investigation agrees by accepting this document that any use or reliance on this document shall be limited by the exceptions and limitations in this report, and with the acknowledgement that actual site conditions may change with time, and that hidden conditions may exist on the subjective property that were not identified during the investigation. Any use or distribution of this report to additional third parties, without the express written permission of EI, is at the sole risk and expense of such users. This report while not a bidding document is intended to assist in the planning and execution of planned renovations.

EnviroRem makes no other claim or representation to any third party beyond that this investigation has used the degree of care and skill ordinarily exercised by environmental consultants in the investigation and preparation of this report and in the collection of data and information related to. No other guaranty is applied to any third party, either expressed or implied. EnviroRem's liability to any third party authorized to use or rely on this report with reference to any acts or omissions shall be limited to a total aggregate maximum of $2,000 or the agreed contract amount for the performance of this investigation, whichever is greater, unless otherwise agreed upon in writing by EnviroRem and said third party user.

If no pre-existing contract or Master Services Agreement exists, the terms and limitations of this report shall serve as the binding contractual document upon delivery.

3.0 PROJECT SITE DESCRIPTION

Project Location and Legal Description

The subject property is located within the AOC control area and is accessed from 3131 Democrat Road, Memphis, Shelby County, Tennessee. Site photography, collected during the course of this investigation (if any), and is provided in Appendices if available.

The property's previous use as the former Tennessee Air National Guard (TANG) facility and current control by FedEx has led to data gaps in known construction history. Structures vary greatly from building to building and were assessed individually. Most structures have undergone significant modern renovations in their history, but some specified relic finishes were discovered.

4.0 FIELD INSPECTION

The following sections contain summaries of visual and physical observations of the subject property on the day of the site investigation.

4.1 Asbestos Containing Materials (ACMs)

EnviroRem conducted a Limited Asbestos Survey (LAS) of the property for suspect ACM. Bulk samples were collected from all suspect regulated friable, Category I, and Category II non-friable materials as they were encountered in the facility in support of prior reports, if available. Bulk sampling methods were in general accordance with procedures outlined in ASTM Standard Practice E 2308-05, *Standard Guide for Limited Asbestos Screens of Buildings*. It should be noted that suspect ACM that has not been identified in this report may be located within walls (i.e. plumbing chases in bathrooms), ceiling cavities and other non-accessible areas. Precaution should be used in relation to these currently unidentified materials until proper sampling and analysis have determined the asbestos content. Substrates of identified type may be excluded as considered homogenous with prior sampled types.

ACM bulk samples were analyzed using polarized light microscopy (PLM) methodology in accordance with the EPA Method 600/M4-82-020 and 600/R-93/116. National Econ Corporation, located in Memphis, Tennessee performed the PLM analysis of the samples. Laboratory analytical reports can be found in Appendices.

When analysis of floor tile or other resin-bound non-friable material by EPA PLM methodology yields negative results for the presence of asbestos, alternative methods of identification such as Transmission Electron Microscopy (TEM) may be prudent. Analysis of such materials by PLM using EPA Method 600/M4-82-020 (December 1982) may yield false-negative results because of method limitations in separating closely bound fibers from matrix material and in detecting fibers of small length and/or diameter. TEM confirmation, although recommended, was not performed.

EI submitted two hundred and ten (210) bulk samples, representing one hundred seventy-four (174) suspect materials.

The sampled suspect ACM and the results of PLM analyses are summarized below. Material type is considered homogenous across structure.

ACM SURVEY RESULTS					
Sample Series.	**Material**	**Location**	**Friable**	**Condition**	**Analytical Results**
A-R	Roofing	Southwide A	No	G	ND
A-DCT	Grid Ceiling Tile	Southwide A	Yes	G	ND
A-DWC	Drywall Composite	Southwide A	Yes	G	ND
A-CB	Vinyl Cove Trim/Mastic	Southwide A	No	G	ND
A-VT	12x12 VCT/Mastic	Southwide A	No	G	ND
GSE-DCT	Grid Ceiling Tile	GSE 3099	Yes	G	ND
GSE-DWC	Drywall Composite	GSE 3099	Yes	G	ND
GSE-CB	Vinyl Cove base/Mastic	GSE 3099	No	G	ND
GSE-RV	Roll Vinyl Flooring	GSE 3099	No	G	ND
3040-DCT	Grid Ceiling Tile	3040	Yes	G	ND
3040-DWC	Drywall Composite	3040	Yes	G	ND
3040-CB	Vinyl Cove base/Mastic	3040	No	G	ND
3040-VT	12x12 Black VCT/Mastic	3040	No	G	ND
3040-VT	12x12 White VCT/Mastic	3040	No	G	ND
3055-R	Asphalt Roofing	3055	No	G	ND
3055-DCT	Grid Ceiling Tile	3055	Yes	G	ND
3055-DWC	Drywall Composite	3055	Yes	G	ND
3055-CB	Vinyl Cove base/Mastic	3055	No	G	ND
3055-RT	Rubber Tile/Mastic	3055	No	G	ND
3055-VT	12x12 VCT/Mastic	3055	No	G	ND
3140-DCT	Grid Ceiling Tile	3140	Yes	G	ND
3140-DWC	Drywall Composite	3140	Yes	G	ND
3140-CB	Vinyl Cove base/Mastic	3140	No	G	ND
3140-VT	12x12 VCT/Mastic	3140	No	G	ND
3140-RV	Roll Vinyl Flooring/Mastic	3140	No	G	ND
3318-DCT	Grid Ceiling Tile	3318	Yes	G	ND
3318-DWC	Drywall Composite	3318	Yes	G	ND
3318-VT	12x12 Vinyl Tile/Black Mastic	3318	No	G	ND
3318-CB	Vinyl Cove base/Mastic	3318	No	G	ND
3505-DCT	Grid Ceiling Tile	3505	Yes	G	ND
3505-DWC	Drywall Composite	3505	Yes	G	ND
3505-CB	Vinyl Cove base/Mastic	3505	No	G	ND
3505-VT	12x12 Vinyl Tile/Black Mastic	3505	No	G	ND
B-VT	**12x12 Vinyl Tile/Black Mastic**	**Southwide B**	**No**	**G**	**7-8% Chrysotile**
B-DCT	Grid Ceiling Tile	Southwide B	Yes	G	ND
B-DWC	Drywall Composite	Southwide B	Yes	G	ND
B-CB	Vinyl Cove base/Mastic	Southwide B	No	G	ND
B-R	Roofing	Southwide B	No	G	ND
C-R	Roofing	Southwide C	No	G	ND

ACM SURVEY RESULTS					
Sample Series.	**Material**	**Location**	**Friable**	**Condition**	**Analytical Results**
C-DCT	Grid Ceiling Tile	Southwide C	Yes	G	ND
C-DWC	Drywall Composite	Southwide C	Yes	G	ND
C-CB	Vinyl Cove base/Mastic	Southwide C	No	G	ND
C-VT	**12x12 VCT/Black Mastic**	**Southwide C**	**No**	**G**	**12% Chrysotile**
D-R	Roofing	Southwide D	No	G	ND
D-PC	Popcorn Ceiling Texture	Southwide D	Yes	G	ND
D-DCT	Grid Ceiling Tile	Southwide D	Yes	G	ND
D-DWC	Drywall Composite	Southwide D	Yes	G	ND
D-CB	Vinyl Cove base/Mastic	Southwide D	No	G	ND
D-VT	**12x12 VCT/Black Mastic**	**Southwide D**	**No**	**G**	**7% Chrysotile**
E-R	Roofing	Southwide E	No	G	ND
E-DWC	Drywall Composite	Southwide E	Yes	G	ND
E-DCT	Grid Ceiling Tile	Southwide E	Yes	G	ND
E-CB	Vinyl Cove base/Mastic	Southwide E	No	G	ND
E-VT1	White 12x12/Yellow Mastic	Southwide E	No	G	ND
E-VT2	Grey 12x12/Yellow Mastic	Southwide E	No	G	ND
E-VT3	Black 12x12/Yellow Mastic	Southwide E	No	G	ND
G-R	Roofing	Southwide G	No	G	ND
G-DCT	Grid Ceiling Tile	Southwide G	Yes	G	ND
G-DWC	Drywall Composite	Southwide G	Yes	G	ND
G-CB	Vinyl Cove base/Mastic	Southwide G	No	G	ND
G-VT	**12x12 VCT/Black Mastic**	**Southwide G**	**No**	**G**	**3-5% Chrysotile**
2878-R	Roofing	2878	No	G	ND
2878-DCT	Grid Ceiling Tile	2878	Yes	G	ND
2878-DWC	Drywall Composite	2878	Yes	G	ND
2878-CB	Vinyl Cove base/Mastic	2878	No	G	ND
2878-VT	VCT/Mastic	2878	No	G	ND
2838-TSI	Boiler Insulation	2838	Yes	D	ND
2808-DCT	Grid Ceiling Tile	2808	Yes	G	ND
2808-WG	Vulcanized Caulking	2808	No	G	ND
2808-CB	Vinyl Cove base/Mastic	2808	No	G	ND
2808-VT	VCT/Mastic	2808	No	G	ND
2825-R	Roofing	2825	No	G	ND
2825-DCT	Grid Ceiling Tile	2825	Yes	G	ND
2825-DWC	Drywall Composite	2825	Yes	G	ND
2825-CB	Vinyl Cove base/Mastic	2825	No	G	ND
2825-VT	VCT/Black Mastic	2825	No	G	ND
2852-R	Roofing	2852	No	G	ND
2852-T	**¼" Transite Siding**	**2852**	**No**	**G**	**40-50% Chrysotile**
2852-FB	**Fiberboard Panels**	**2852 (Interior)**	**No**	**G**	**60% Chrysotile**

ACM SURVEY RESULTS					
Sample Series.	**Material**	**Location**	**Friable**	**Condition**	**Analytical Results**
2852-WG	Window Glazing	2852	No	G	ND
2875-R	Roofing	2875	No	G	ND
2875-DCT	Grid Ceiling Tile	2875	Yes	G	ND
2875-DWC	Drywall Composite	2875	Yes	G	ND
2875-CB	Vinyl Cove base/Mastic	2875	No	G	ND
2875-VT	VCT/Black Mastic	2875	No	G	ND
2855-R	Roofing	2855	No	G	ND
2855-TSI	Silicate TSI	2855 (Attic)	Yes	G	ND
2855-DCT	Grid Ceiling Tile	2855	Yes	G	ND
2855-DWC	Drywall Composite	2855	Yes	G	ND
2855-CB	Vinyl Cove base/Mastic	2855	No	G	ND
2855-VT	White VCT/Yellow Mastic	2855	No	G	ND
2855-VT	Black VCT	2855	No	G	ND
2903-CB	Vinyl Cove base/Mastic	2903	No	G	ND
2903-VT	VCT/Black Mastic	2903	No	G	ND
AD-DCT	Grid Ceiling Tile	Administration	Yes	G	ND
AD-DWC	Drywall Composite	Administration	Yes	G	ND
AD-CB	Vinyl Cove base/Mastic	Administration	No	G	ND
AD-VT	**VCT/Black Mastic**	**Administration**	**No**	**G**	**7-8% Chrysotile**
H6-DCT	Grid Ceiling Tile	Hangar 6	Yes	G	ND
H6-DWC	Drywall Composite	Hangar 6	Yes	G	ND
H6-CB	Vinyl Cove base/Mastic	Hangar 6	No	G	ND
H6-VT	**VCT/Black Mastic**	**Hangar 6**	**No**	**G**	**7% Chrysotile**
H7-DCT	Grid Ceiling Tile	Hangar 7	Yes	G	ND
H7-DWC	Drywall Composite	Hangar 7	Yes	G	ND
H7-CB	Vinyl Cove base/Mastic	Hangar 7	No	G	ND
H7-VT	**VCT/Mastic (Layered)**	**Hangar 7**	**No**	**G**	**15-18% Chrysotile**

NA – Not Analyzed ND – No Asbestos Detected NS – Not Sampled SF – Square Feet LF – Linear Feet

Findings:

Confirmed ACMs are as follows:

Corrugated Transite Roofing	Building 2838
Transite Siding	Building 2852
Fiberboard interior sheeting	Building 2852
Vinyl Tile on Black Mastic	Southwide B, C, D, G, Administration, Hangar 6 & 7

Presumed ACMs are as follows:

Roofing	Hangar 6, 7, Admin, Southwide F, 2808, 2903, 3040, GSE, 3140, & 3505

Non-suspect Materials are as follows:

Fiberglass TSI	Modern Fiberglass pipe insulations located throughout the study area.
Fiberglass Batt Insulations	Commercial Batt insulations located through the study area.

Concealed areas to be investigated with selective demolition:

Pipe insulations	Wet-wall cavities of structures in study area.

Cat. I and Cat. II Non-friable ACMs, if elected for removal, shall be removed as a Class II abatement operation pursuant to 29 CFR 1926.1101.

According to NESHAPs regulation, friable ACMs shall be removed prior to demolition of a structure or abatement activities, if greater than 160 LF or 260 SF. Shelby County Health Department – Air Pollution Control (SCHD-APC), the local authority of NESHAP, also regulates the removal of Category II non-friable asbestos materials (Transite) prior to demolition.

Category I non-friable materials may be demolished with structures. These materials include roofing, confirmed or presumed, and vinyl tiles with mastic. Tiles and mastic, if demolished with structure, shall necessitate landfill disposal of demolition substrate. Cost-benefit analysis should be considered to weigh the advantages of abatement of Cat. I materials or demolition in place of materials.

Both abatement and demolition activities shall occur under full 10-day notification to SCHD-APC pursuant to NESHAP regulations.

All ACMs and quantities thereof shall be verified in the field by prospective bidders.

4.2 Damaged Painted Surfaces (Lead)

Potential lead based paint (LBP) was assessed and sampled based on current published regulatory guidance for the demolition setting of whole buildings.

The US EPA has stated that solid architectural components coated with LBP are less likely to be hazardous because of the small ratio of lead paint to total waste mass. The US Army conducted a study which concluded that whole-building demolition debris is not likely to exceed the toxicity characteristic standard for lead if it is handled as a single, whole waste stream and disposed of all together. Whole-building demolition is therefore considered a non-hazardous waste with regard to lead.

Furthermore, to meet the NESHAP standard of "no visible emissions" surfaces with lead paint finishes should be in "good" condition prior to demolition activities to mitigate the potential for loose flakes to migrate from the work area. As such, surfaces with noted delamination of paint surfaces were bulk sampled for lead concentration to determine if such paints are lead based, 0.5% or greater by weight. Bulk samples were collected in the field during site reconnaissance and submitted to EMSL St. Louis, under chain of custody, for analysis by flame atomic absorption via EPA method 7000B.

Damaged paints and their lead concentration are as follows.

Building	Location	Material	Sample No.	Result
TLA 2903	2nd Floor Stairwell	Ceiling Paint	TLA	0.055% Pb
2825	Northwest Foyer	Southeast Wall	2825	<0.013% Pb
Hangar 7	East Hangar Door	Green Door Paint	H7	4.0% Pb

Findings:

Of the observed damaged painted surfaces that may delaminate during demolition, the **East hangar door of Hangar 7 is finished with LBP**. It is recommended that scaling surface of door be repainted with latex or lockdown to restore the surface to "good condition" prior to demolition activities to meet the "visible emission" standard of NESHAP.

Selected personnel repairing surfaces to good condition should be familiar with the OSHA 29 CFR 1926.62 standard.

4.3 Moisture Intrusions

General moisture intrusion survey was conducted of structures with escort personnel of Brock. Brock performs general maintenance activities for the facility including corrective measures for minor intrusions in active buildings, such as stained ceiling tiles. These materials were submitted for repair as discovered under standard operating procedure.

The following table summarizes visual inspection of buildings, apparent source vector of moisture, and visible indication of microbial colonization. Minor intrusions are not reported due to maintenance activity unless distribution is wide spread throughout structure.

Building	Area	Source Vector	Suspect Microbial, notes
Hangar 7	2nd Floor West	Unknown	No, mitigation underway to address
Admin	3rd Floor	Roof	No, vacant building syndrome (humidity damage)
Hangar 6	2nd floor hangar	Roof	No, vacant building syndrome
Southwide B	Throughout	Roof	No, minor dispersed ceiling tile staining
Southwide D	Throughout	Roof/Open Doorways	No, moderate damage due to high humidity in 50% of structure.
2825	Northwest Foyer	Skylight seal	Yes, localized substrate damage from long term intrusion
2825	Command Center	Subgrade	No, long term flooding of crawlspace has led to failure of flooring system.
2855	Throughout	Roof	No, long term vacant building syndrome
2875	Cafeteria	Skylight	Yes, chronic intrusion source with deteriorating substrates
2875	Office areas	Roof	Yes, chronic intrusion with uncontrolled humidity
2878	Southeast office	Roof	Yes, vapor barrier intrusion behind wallpaper

4.4 Hazardous Wastes

Hazardous waste survey was conducted in during site reconnaissance to ascertain potential waste streams that could generate hazardous materials during the course of demolition or renovation. Materials that will be utilized for their intended purpose generally will not constitute a hazardous waste stream unless disposed in their existing condition, such as retail packaged paints. Materials moved from one location to another for use or reuse would not generate a “waste” as defined by federal regulation nor does the presence of such a material necessarily generate a hazard. The disposal of such materials would warrant special consideration however under the Toxic Substances Control Act.

The bulk material noted in the study area that could generate hazardous waste streams are categorized as Universal Wastes. Universal wastes are widely utilized in residential and commercial applications and handling such materials are routine during demolition activities.

The following table summarizes location, material, and potential waste stream of observed materials that may form a hazardous waste during demolition or renovation activities.

Location	Material	Use	Potential Hazard
Throughout Facility	Fluorescent Bulb	Lighting	Hg (Universal Waste)
Throughout Facility	Mercury Vapor Bulb	Lighting	Hg (Universal Waste)
Throughout Facility	Lighting Ballasts	Lighting	PCB or Petroleum (Universal Waste)
Throughout Facility	Refrigerant	HVAC	CFCs
Throughout Facility	Back-up Batteries	Lighting	Pb, pH, RCRA 8 (Universal Waste)
Throughout Facility	Electronics Waste	Routine	RCRA 8 (E-Waste)
Throughout Facility	Thermostats	HVAC	Hg or E-Waste (Universal Waste)
Admin, Southwide C, D, 3040 ARTC, GSE 3099	Hydraulic Fluid	Elevator, Maintenance	Petroleum, PCB
Southwide C,	Retail Paints	Maintenance	RCRA 8, Petroleum
Southwide E	Fuel	Generator	Petroleum
Southwide E	Cleaning Products	Maintenance	pH
2826	Crushed Bulbs	Maintenance	Hg
2838, 2852	Water Treatment	Maintenance	pH
2878	Pad mount transformer	Electrical	PCB, Mineral Oil
2884	Hydrogen Fuel	Fuel	Not listed as toxic (note cryogenic hazard)

Materials of note should be destined for recycling or specialized disposal activities during demolition activities. Refer to applicable DOT, EPA, and OSHA regulations.

REFERENCES

ASTM E1527-13, *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process,* ASTM International, West Conshohocken, PA, 2013

ASTM International. *Standard Guide for Readily Observable Mold and Conditions Conducive to Mold in Commercial Buildings: Baseline Survey Process*, ASTM Designation E 2418-06. March 2006.

ASTM International. *Standard Guide for Limited Asbestos Screens of Buildings*, ASTM Designation E 2308-05. August 2005.

OSHA Archives. *MAX EUBANK ROOFING COMPANY, INC. and THE NATIONAL ROOFING CONTRACTORS ASSOCIATION,Petitioners, v THE UNITED STATES THE DEPARTMENT OF LABOR,OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION*. No. 94-40793.

EPA Document. *Applicability of the Asbestos NESHAP to Roofing Removal Operations.* EPA 340-8-94-001, August 1994.

US EPA. *1993. Applicability of RCRA disposal requirements to lead-based paint abatement wastes. Final Report. Technical Programs Branch, Office of Pollution Prevention and Toxics.* March 1993.

US Dept. of the Army. *US Army Environmental Hygiene Agency. Interim Final Report. Lead-based paint contaminated debris waste characterization study No. 27-26-JK44-92.* May 1993.

5.0 APPENDICES

Lab Data Interpretation

The following laboratory sheets provide raw data as provided to EI. This information is summarized in the preceding report and lab data sheets are provided as reference material for technical personnel as needed.

Asbestos Labs

Asbestos lab data contains "Sample Identifier" and content percentages of phased light microscopy analysis. Content percentages will display regulated asbestiform fiber types in the upper column area and "non-asbestos" content in the lower column area.

Sample Identifier

Asbestos sample numbers follow the general pattern of X-Y-Z. X represents the building identifier, typically street number or assigned naming, of where the sample was collected. Y represents the material type abbreviation, such as "DWC" for drywall composite or "VT" for vinyl tile. Z will be unique for the X-Y combination as the sequential sample number of collected materials.

Samples that contain greater than 1.0% asbestos are defined as "Asbestos Containing Materials". Samples of 1.0% or less, such as "Trace", although a material of note, are not defined as Asbestos Containing pursuant to EPA definition. Asbestiform fibers identified during analysis are named by their geologic name under the "Asbestos Mineral" heading. Non asbestos content are identified under the heading "Non-Asbestos"

Refer to NIST document EPA/600/R-93/116 for technical methodology.

Lead Labs

Lead data sheets present raw quantification data of analysis of lead based paints by Flame Atomic Absorption via Method 7000B. Data sheets display to the left inspector sample number and assigned lab sample number. To the right of the sheet, a column headed "RDL" designates the detection limit based on mass of submitted sample. Under the heading "lead concentration" a number will be displayed of lead detected by gas chromatography leading to mass spectrometer. The EPA defines lead based paint as paints containing 0.5% or greater by weight lead.

As such samples with numbers to the far right of <0.5% are not defined as lead based.

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Hangar 6	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Ceiling Tile	Non-detect (ND)	Not-applicable (NA)	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	7% Chrysotile	Cat. I	Remove damaged prior
Fiberglass TSI	Not Suspect	NA	NA
Roofing	Not Sampled	Cat. I (PACM)	Assume or Sample prior

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
2nd Floor	Ceiling Tile	No	Light and localized

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
5 units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Hangar 7	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Ceiling Tile	Non-detect (ND)	Not-applicable (NA)	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	15-18% Chrysotile	Cat. I	Remove damaged prior
Fiberglass TSI	Not Suspect	NA	NA
Roofing	Not Sampled	Cat. I (PACM)	Assume or Sample prior

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
Green on Door	4.00%	East Hangar Door	Stabilize prior to demolition

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
2nd Floor Offices	All	No	Mitigation underway

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
4 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Admin (2861)	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Ceiling Tile	Non-detect (ND)	Not-applicable (NA)	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	7-8% Chrysotile	Cat. I	Remove damaged prior
Fiberglass TSI	Not Suspect	NA	NA
Roofing	Not Sampled	Cat. I (PACM)	Assume or Sample prior

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
3rd Floor Area	All	No	Mitigation underway

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
15 Gallons	Hydraulic Fluid	Elevator System	PCB, Petroleum
13 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Southwide A	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Ceiling Tile	Non-detect (ND)	Not-applicable (NA)	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Roll Vinyl Flooring	ND	NA	NA
Fiberglass TSI	Not Suspect	NA	NA
Roofing	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None	NA	NA	NA

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
13 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Southwide B	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Ceiling Tile	Non-detect (ND)	Not-applicable (NA)	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	7-8% Chrysotile	Cat. I	Remove damaged prior
Fiberglass TSI	Not Suspect	NA	NA
Roofing	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
Throughout	Ceiling Tiles	No	Sporadic and localized

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
31 Units	Refrigerant	HVAC	CFC
28 Pieces	Scrap Electronics	Service Parts	E-waste

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Southwide C	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Ceiling Tile	Non-detect (ND)	Not-applicable (NA)	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	12% Chrysotile	Cat. I	Remove damaged prior
Fiberglass TSI	Not Suspect	NA	NA
Roofing	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
Throughout	Ceiling Tiles	No	Scattered and localized

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
10 Units	Refrigerant	HVAC	CFC
4 55-gallon drums	Hydraulic Fluid	Maintenance	Petroleum, if discarded
76 1-gallon pails	Paint	Maintenance	Petroleum, RCRA8, if discarded

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Southwide D	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Ceiling Tile	Non-detect (ND)	Not-applicable (NA)	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	7% Chrysotile	Cat. I	Remove damaged prior
Fiberglass TSI	Not Suspect	NA	NA
Roofing	ND	NA	NA
Ceiling Texture	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
Throughout	Ceiling Tiles	No	Scattered and localized

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
12 Units	Refrigerant	HVAC	CFC
2 55-gallon drums	Hydraulic Fluid	Maintenance	Petroleum, if discarded

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Southwide E	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Ceiling Tile	Non-detect (ND)	Not-applicable (NA)	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	ND	NA	NA
Fiberglass TSI	Not Suspect	NA	NA
Roofing	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
Throughout	Ceiling Tiles	No	Scattered and localized

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
24 Units	Refrigerant	HVAC	CFC
16 1-gallon	Cleaning Fluids	Janitorial	pH, if discarded
40 gallons	Fuel	Generator AST	Petroleum, if discarded

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Southwide F	**Status:**	

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Fiberglass TSI	Not Suspect	NA	NA
Roofing	Not Sampled	Cat. I (PACM)	Assume or sample prior

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None			

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	Southwide G	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Fiberglass TSI	Not Suspect	NA	NA
Roofing	Non-detect (ND)	NA	NA
Ceiling Tiles	ND	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	3-5% Chrysotile	Cat. I	Remove damaged prior

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None			

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
	Thermostats	HVAC	Mercury (Universal)
12 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2808	**Status:**	Active (recent renovation)

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing (EPDM)	Not sampled	Cat. I	Sample or assume
Ceiling Tile	Non-detect (ND)	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tiles	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA
Vulcanized Caulk	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
#104	Ceiling Tile	No	Localized

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
7 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2825	**Status:**	Inactive

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing	Non-detect (ND)	NA	NA
Ceiling Tile	ND	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
Tan on Wall	<0.013%	Northwest Foyer	None

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
Throughout	All	Yes	Vacant Building Syndrome
Control Center	Subfloor	Yes	Crawlspace Flooding

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
7 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2826	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Metal Roofing	Not suspect	NA	NA
Metal Walls	Not suspect	NA	NA
Concrete Floor	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None	NA	NA	NA

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
1 Drum	Crushed Bulbs	Waste Storage	Mercury

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2838	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Transite Roofing	PACM	Cat. II	Remove prior to demo
Boiler Wall TSI	Non-detect	NA	NA
Tank TSI	Non-detect	NA	NA
Fiberglass TSI	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None	NA	NA	NA

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
4 Pails	Water Treatment	Boiler Maintenance	pH if disposed

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2852	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing Felt	Non-detect (ND)	NA	NA
1/4" Transite Siding	40-50% Chrysotile	Cat. II	Remove prior to demo
Interior Panels	60% Chrysotile	Cat. II	Remove prior to demo
Fiberglass TSI	Not suspect	NA	NA
Window Glazing	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None	NA	NA	NA

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
4 Pails	Water Treatment	Boiler Maintenance	pH if disposed

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2855	**Status:**	Inactive

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing	Non-detect (ND)	NA	NA
Ceiling Tile	ND	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA
Calcium TSI (Attic)	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
Throughout	All	Yes	Vacant Building Syndrome

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
8 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2860	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Metal Roofing	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None			

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2875	**Status:**	Inactive

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing	Non-detect (ND)	NA	NA
Ceiling Tile	ND	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
East Annex	All	Yes	Significant and widely
Main Hall	Wall and floor	Yes	Significant via Skylight

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
14 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2878	**Status:**	Active (minimal)

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing	Non-detect	Not-applicable (NA)	NA
Ceiling Tile	ND	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
Throughout	Ceiling Tiles	Yes	Scattered throughout
Southeast Office	Drywall	Yes	Vapor barrier intrusion

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
4 Units	Refrigerant	HVAC	CFC
30 gallons	Dielectric Fluid	Transformer	PCB or Mineral Oil

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2884	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
No suspect material			

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None			

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
AST	Hydrogen	Fuel	NA

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	2903 TLA	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing (EPDM)	Not sampled	Cat. I	Sample or assume
Vinyl Cove Trim	Non-detect (ND)	NA	NA
Vinyl Tiles	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
Multilayer Ceiling	0.055%	2nd Floor Stairs	None

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
#104	Ceiling Tile	No	Localized

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
10 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	3040 ARTC	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing (EPDM)	Not sampled	Cat. I	Sample or assume
Ceiling Tile	Non-detect (ND)	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tiles	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None significant	NA	NA	NA

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
28 Units	Refrigerant	HVAC	CFC
15 Gallons	Hydraulic Fluid	Elevator	Petroleum, PCB

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	3055 Portia	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing	Non-detect (ND)	Not-applicable (NA)	NA
Ceiling Tile	ND	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA
Rubber Tile	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None			

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
9 units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	GSE (3099)	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Ceiling Tile	Non-detect (ND)	Not-applicable (NA)	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Roll Vinyl Flooring	ND	NA	NA
Fiberglass TSI	Not Suspect	NA	NA
Roofing	Not Sampled	Cat. I (PACM)	Assume or Sample prior

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None	NA	NA	NA

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
15 Gallons	Hydraulic Fluid	Elevator System	PCB, Petroleum
9 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	3140 Tchulahoma	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing	Not Sampled	Cat. I	Sample or assume
Ceiling Tile	Non-detect (ND)	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA
Roll Vinyl Flooring	ND	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None			

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
17 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	3505 Tchulahoma	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing	Not Sampled	Cat. I	Sample or assume
Ceiling Tile	Non-detect (ND)	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None			

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
3 Units	Refrigerant	HVAC	CFC

FedEx Environmental Audit
Specified Structures
3131 Democrat Road, Memphis, Shelby County, Tennessee

Building ID:	3318 Winchester	**Status:**	Active

NESHAP Asbestos Inspection			
Suspect Material	**Lab Result**	**Category**	**NESHAP Minimum for Demo**
Roofing	Not Sampled	Cat. I	Sample or assume
Ceiling Tile	Non-detect (ND)	NA	NA
Drywall Composite	ND	NA	NA
Vinyl Cove Trim	ND	NA	NA
Vinyl Tile	ND	NA	NA
Fiberglass TSI	Not suspect	NA	NA

NESHAP Lead Based Paint			
Damaged Paint	**Lab Result**	**Location**	**Requirement for NESHAP**
None	NA	NA	NA

Water Intrusion Damage			
Area	**Material**	**Suspect Microbial**	**Average Distribution**
None			

Hazardous Waste Streams			
Quantity	**Material**	**Usage**	**Potential Waste**
	Vapor Lamps	Lighting	Mercury (Universal)
	Thermostats	HVAC	Mercury (Universal)
	Dielectric Ballast	Lighting	PCB (Universal)
8 Units	Refrigerant	HVAC	CFC